

INTERNATIONAL MONETARY FUND

Taking Stock of Infrastructure in Malta

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SIP/2025/007

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed on December 17, 2024. This paper is also published separately as IMF Country Report No 25/18.

2025
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SELECTED ISSUES PAPER

IMF Selected Issues Paper
European Department

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Authorized for distribution by Kotaro Ishi
February 2025

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ABSTRACT: Malta's rapid growth over the past two decades has gone hand in hand with a significant expansion of the population. This has created bottlenecks in infrastructure, which will need to be addressed. While capacity in energy and water supply is currently adequate, investments in wastewater treatment and solid waste disposal are needed, as well as measures to reduce greenhouse gas emissions. In transport, need for action to ease congestion is urgent, while the costs for a sustainable solution are high and implementation would take time.

RECOMMENDED CITATION: Alexander Pitt, *Taking Stock of Infrastructure in Malta* (IMF Selected Issues Paper No. 25/18), International Monetary Fund, 2025. [Malta Selected Issues](#)

JEL Classification Numbers: H40, H54, Q40, Q54, R4

Keywords: Malta, infrastructure, energy, water supply, desalination, congestion

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Malta

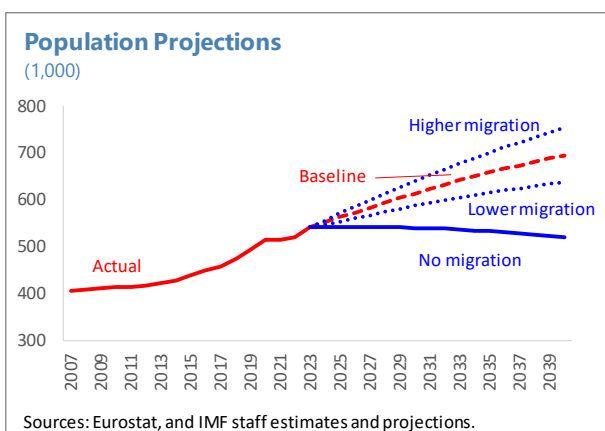
Prepared by Alexander Pitt

TAKING STOCK OF INFRASTRUCTURE IN MALTA¹

Malta's rapid growth over the past two decades has gone hand in hand with a significant expansion of the population. This has created bottlenecks in infrastructure, which will need to be addressed in the medium term.

A. Introduction

- 1. Malta's economic performance over the past decade has been remarkable.** Between 2014 and 2019, growth averaged 7½ percent per annum, and per-capita income rose from 69 percent of the Euro Area average to 84 percent, and further to 92 percent in 2023. The economy also suffered relatively little during the pandemic (output contracted by only 3.5 percent in 2020), and recovered rapidly.
- 2. Economic growth has been accompanied by significant immigration to supply the labor force required to expand the tourism industry and other industries, including professional services, ICT, and gaming.** As a result, since 2014 the population has grown by one-quarter to around 563,000 at end-2023, raising the population density to 1,789 persons per km² (and on the main island to 2,121 persons per km²). With that, Malta is by far the most densely populated country in the EU. At the same time, tourism arrivals increased from 1.7 million in 2014 to just under 3 million in 2023 (though the average number of nights declined somewhat).
- 3. The high population density, combined with high tourist arrivals, is straining Malta's infrastructure and necessitates investments to keep up with projected population growth.** At the same time, limited available land constrains certain infrastructure segments, such as housing and road transport, whereas water and power supplies can be expanded significantly with adequate investment.
- 4. According to Eurostat, Malta's population is projected to grow by 28 percent by 2040 under the baseline and could approach 40 percent in a high-immigration scenario.**² This will put significant strains on public infrastructure. The following sections will discuss current and prospective capacity constraints in power supply, water supply, wastewater treatment, waste management, and transportation.



¹ Prepared by Alexander Pitt. The author thanks participants of a workshop held at the Central Bank of Malta for useful discussions and comments.

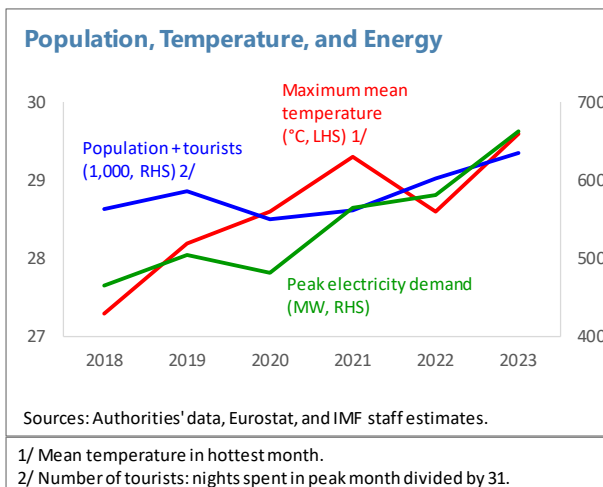
² This assumes a gradually declining net immigration from 2028 onward.

B. Power

5. Peak electricity demand has increased rapidly in recent years, rising from 465 MW in 2018 to 663 MW in 2023 (an increase of 43 percent). This increase has significantly outpaced the growth in population and tourists in the peak summer season (an increase of 13 percent over the same period). In part, this may be related to the rise in mean temperatures in the hottest month from 27.3 °C to 29.6 °C.³

6. While rising temperatures are likely to lead to increased demand for air conditioning and hence, electric power, other factors also play a role.

Notably, Malta's fleet of electric vehicles (EVs) grew by around 50 percent in 2023 and more than doubled since 2021 (Box 1). Also, the introduction of shore-to-ship power to reduce air pollution from visiting cruise ships is adding to power demand.



Box 1. Malta: Electric Vehicles

Malta is an ideal environment for EVs. The islands' (Malta island and Gozo) small size makes 'range anxiety' a non-issue (except when vehicles are ferried to the European mainland). At end-2023, about 1.3 percent of passenger cars were fully electric (EU average: 1.7 percent, EU median: 1 percent), and 7.8 percent of motorcycles. Overall, 13,000 EVs (though more than 60 percent are motorcycles, e-bikes, and scooters) are registered, out of 438,000 vehicles in total.

The government aims to increase the number of EVs to 65,000 by 2030, representing about 13 percent of all vehicles.¹ To reach this ambitious target—which implies annual growth of 26 percent from end-2023—under the National Recovery and Resilience Plan (NRRP), the government has introduced large subsidies to encourage people to buy EVs. In addition, it provides scrapping incentives for conventional cars, is installing a network EV charging station, and is procuring electric buses for public transport.²

The expected rapid growth of EVs should significantly increase demand for electricity over the next decade. While EVs do not necessarily add to peak demand—and can even act as a battery, feeding electricity into the grid when not in use—they do add to overall demand for electric power.

¹ This assumes that the population grows in line with baseline projections, and the ratio of vehicles to population remains constant at 0.81 (the level in 2023).

² The subsidies will be reduced in 2025 but remain generous when compared to other EU member states.

³ Peak temperatures rose from 34 °C to almost 42 °C over the same period.

7. The installed capacity of fossil fuel-fired power plants (largely gas, dual fuel, and gas oil) and renewables (largely photovoltaic—PV), combined with the import capacity provided by the interconnector cable with Italy appears adequate for the time being (Table 1). The

construction of a second interconnector (225 MW capacity) scheduled for completion in 2026, the planned addition of battery storage and a waste incinerator, and the continued growth of renewables will provide additional capacity.^{4,5}

8. On the demand side, the authorities project an increase of peak power demand of around 30 percent by 2040 under a high-temperature and high-population growth scenario. Under this scenario, new generation and/or import capacity would be needed around 2033. Assessments are underway to identify options for additional generation capacity post-2030, including, possibly, further interconnectivity, to address the N-1 policy to ensure security of supply. In addition, the authorities are also planning to further increase PV capacity and battery storage, as well as develop offshore wind farms. However,

due to the depth of the Mediterranean Sea around Malta, the latter will have to be built on floating platforms, which is a relatively new technology compared to traditional bottom-fixed offshore wind and could lead to technical challenges.

9. The authorities also intend to incentivize energy efficiency measures and enhance consumer flexibility. This would, however, require additional investments in smart grids that can, for example, integrate EVs as flexible storage units.

C. Water

10. The Water Services Corporation (WSC) is the main supplier of water for households and the service industries, including tourism. Ninety percent of the water supplied by the WSC is

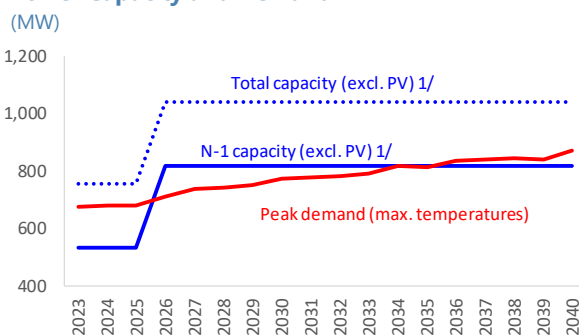
Table 1. Malta: Power Capacity

Generation	777
Fossil fuels	533
Photovoltaic	241
Other renewable	3
Import	225
Total	1,002

Source: NSO, authorities.

Note: Additional temporary diesel power generation capacity of 60 MW has been installed in 2023.

Power Capacity and Demand



1/ Excludes temporary back-up generators.

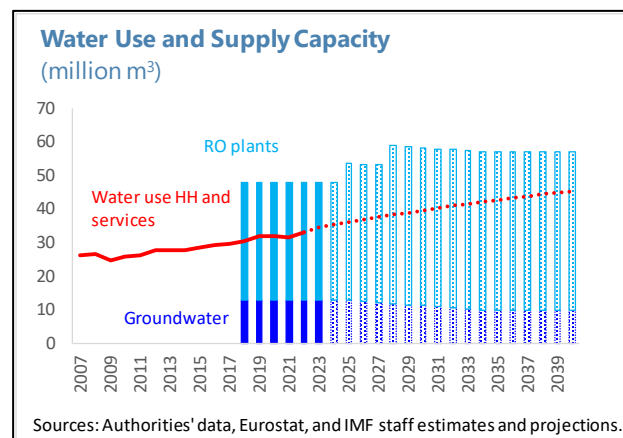
Sources: Authorities, and IMF staff estimates and projections.

⁴ A rise in power outages in 2023 was unrelated to the capacity of the system to provide enough power *per se*; however, the capacity of the distribution network has not kept pace with demand spikes, especially during heat waves. In response, the ENEMALTA (the main electricity supplier and sole distributor) has made significant investments in the distribution infrastructure and also added mobile decentralized (diesel) power generation capacity, and power outages in 2024 have been reduced.

⁵ The authorities maintain an “N-1” policy, which stipulates that power supply must be guaranteed even in the event of the failure of the largest power plant or the interconnector with Italy (in future one of the then two interconnectors).

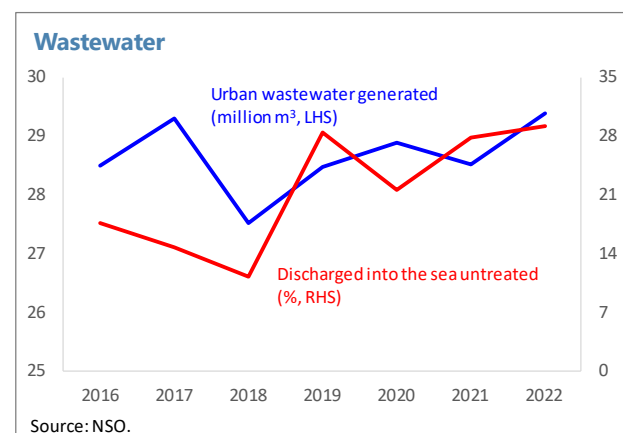
directed to these sectors.⁶ Hence, water use from the WSC and population (including tourists) are closely correlated. Currently, around 36 percent of the public water supply comes from fresh groundwater and surface water, while the remainder is produced by reverse osmosis (RO) desalination plants. The amount of groundwater abstraction has been relatively stable at around 13 million m³ per year, while the production of desalinated water has steadily increased, from around 17 million m³ per year during 2004-13 to around 20 million m³ in 2014-23 (and 24 million m³ in 2023). Losses have been reduced significantly since 2004 but still amount to some 10 percent of total water pumped into the mains.

11. Water demand is set to rise. With the population growing in the baseline scenario to 695,000 by 2040 and growth of tourist arrivals conservatively assumed at 3 percent per year (well below the average over the last decade) with a constant length of stay, the demand for fresh water is estimated to reach about 45 million m³ per year by 2040. If groundwater abstraction declines from around 13 million m³ to 10 million m³ over the next 10 years and losses are contained at around 4 million m³ (which would reduce the loss rate to below 10 percent), this implies a need to produce around 36 million m³ of desalinated water per year then. Malta's RO plants currently have a production capacity of 35 million m³ per year. However, investments are planned to increase capacity to 41 million m³ in 2025 and 47 million m³ by 2028.



D. Wastewater

12. The entire population of Malta is connected to wastewater treatment plants (the first country in the EU). However, the share of urban wastewater discharged untreated into the sea is rising and stands currently at 30 percent.⁷ The share of wastewater receiving at least secondary treatment according to EU requirements is 7½ percent, far below the EU average of 81 percent and in violation of EU directives (though the average pollution removal rate is 80 percent). While some investments have been made to enhance the



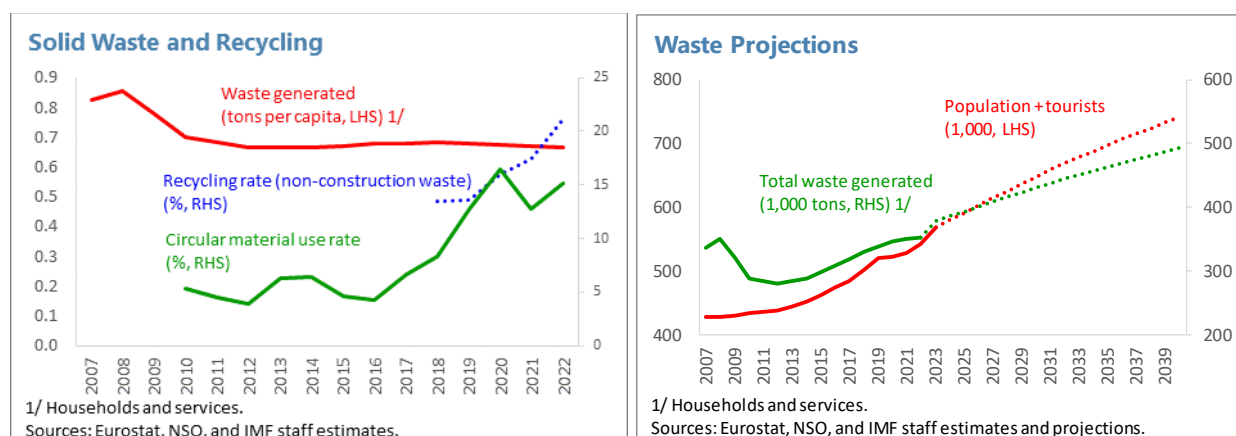
⁶ Some hotels have their own water supply (reverse osmosis plants). The industrial and agricultural sectors also have their own sources, mainly groundwater abstraction.

⁷ To a significant extent, this is because farmyard wastewater is connected to the urban wastewater collection system.

capacity of treatment plants, more will be needed to reach EU standards and keep pace with an expanding population and tourism flows. In this regard, several wastewater treatment and sludge management facilities are to be upgraded by 2027, and the authorities are planning to disconnect farmyard waste from the urban wastewater collection network, thereby improving the operational capacity of the current wastewater treatment infrastructure. Measures to curb seawater infiltration and stormwater runoff intrusion are also underway.

E. Solid Waste

13. Malta has made progress in increasing its use of circular material, reaching 15 percent in 2022, one of the highest rates in the EU (average 11½ percent, median 7½ percent). It also reduced waste generation per capita (by households and service industries) to around 0.7 tons by 2010. However, since then, progress has largely stalled, and a rising population and increasing tourist arrivals have increased total waste generation. Moreover, waste in the construction sector stands at 3.9 tons per capita, well above the EU average (1.9 tons). Despite the higher waste generation, landfill usage (around 300,000 tons/year) has remained broadly unchanged, with incineration and recycling picking up.



14. More investments are needed to cope with increasing volumes of solid waste.

Incineration is increasing, and a waste-to-energy plant is being planned. Under the NRRP, a strategy to reduce waste in the construction sector by increasing recycling rates is also being adopted.

F. Transport

15. Malta's small size and dense population pose unique challenges for land management and transport infrastructure (Table 2). It is difficult to compare Malta with other islands: in Europe, the Spanish region of Menorca comes closest to Malta in terms of area, though it is still more than twice as large as Malta and has a much smaller population. The Balearic Islands in total—also a major tourism destination—are much larger than Malta, with a much lower population density. On the other end, Singapore, while still twice as large as Malta, is similarly densely populated. At the same time, Malta's size and population resemble those of several small- to mid-

sized central European cities.⁸ Most of these cities have public transportation networks that consist not only of bus networks (like Malta) but also tram lines.

Table 2. Malta: Spatial Indicators (2022)

	Malta	Singapore 1/	Balearic Islands 2/
Area and population			
Area (km ²)	315	736	4,984
Population (1,000)	520	6,037	1,187
Population density (persons/km ²)	1,649	8,207	238
Transport			
Road network (km)	2,841	9,644	2,155
Roads/km ²	9.0	13.1	0.4
Roads/1000 persons	5.5	1.6	1.8
Cars/road km	112	69	363
Cars/100 persons	61	11	66
Cars per km ² of artificially covered land	3,658	1,736	1,724
Buses/road km	0.8	1.9	1.2
Buses/100 persons	0.5	0.3	0.2
Rail network	no	yes	no
Land cover and use (2018)			
Artificial land (cover, % of total)	27.5	52.3	9.1
Residential buildings (use, % of total)	17.8	14.1	8.6
Transport (use, % of total)	4.9	11.4	2.6

Sources: Eurostat, Singstat, CEIC data.

1/ 2024 (area and population), 2023 (transport data), 2020 land cover and use data.

2/ Land cover and use data from 2018.

16. A relatively large share of Malta’s land area coverage is “artificial” (mostly buildings and roads). This implies that, while car ownership is comparable to levels in the Balearics (and the EU as a whole), the number of cars per square kilometer of *artificially covered land* (where most traffic occurs) is twice as high as in the Balearics. In Singapore, in contrast, where artificial land cover is almost twice the rate in Malta, car ownership is much lower, with a well-developed public transportation network including buses, metros, and light rails.

17. In Malta, public transport is free for residents, and the bus fleet is relatively large—one bus for every 200 persons, more than twice as many as in the Balearics. However, while take-up has increased significantly, it remains limited, as travel times are relatively long, and buses are also affected by congestion. The government is planning some initiatives to ease congestion, e.g., by managing traffic flows better over the course of the day and introducing express bus lines. However, reducing car use would likely also require measures to increase costs, for example, by raising fuel

⁸ Malta is divided into two NUTS 3 regions: Malta, and Gozo and Comino. Gozo and Comino (two smaller islands off the main island of Malta) have a population density of 552 persons per square kilometer. For example, NUTS 3 regions comparable to Malta in terms of area and population density are Katowice, Copenhagen surroundings, Krakow, Lodz, Poznan, Riga, Szczecin, and Wroclaw.

prices, raising vehicle taxes, and introducing charges for public parking spaces, which the government currently does not intend to pursue.

18. The road network is already very dense—nine kilometers of road per square kilometer, 21 times as many as in the Balearics, though only two-thirds of Singapore’s level. A relatively high share of the total land area is devoted to transport infrastructure. Moreover, experience in other countries suggests that the expansion of the road network only briefly relieves congestion as car ownership and use tend to rise with more roads available. On the other hand, a rail-based public transport system could be effective to limit congestion and offer attractive alternatives to car use. However, this would be either very costly (a metro would require investments amounting to about 34 percent of GDP, though spread over 15-20 years), or encounter geographic constraints (a tram network would, while more efficient than buses, require space for its tracks which would mostly have to be on the surface to contain costs).⁹

G. Conclusions

19. Malta is facing significant investment needs in the short and medium term. While power and water supply capacities are adequate in the short term, investments to enhance capacity in the medium term are needed. In areas such as wastewater treatment and solid waste disposal, investments are needed to reduce environmental stress and comply with EU targets. Transport is the area where the need for action to ease congestion is urgent, while the costs for a sustainable solution are high and implementation would take time. Pricing actions—e.g., on vehicle and fuel taxes, or parking charges—would be helpful.

20. Planning ahead is therefore important. The planned launch of a strategic development plan (the “Vision Malta 2050”) offers an opportunity to spell out a longer-term development strategy. Such a strategy, however, would also need to spell out the investment needs and costs that arise from them.

⁹ Times of Malta ([Government unveils 25-station, €6.2 billion underground Metro proposal](#)). A study conducted in 2022 concluded that a metro system of 35 km length would cost €6.2 (34 percent of 2022 GDP) and would take 15-20 years to build. A first phase could be constructed within five to eight years and cost €3.9 billion.