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An In-Depth Analysis of Malta's Air Connectivity in 2024

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Abstract

This discussion paper presents a comprehensive analysis of Malta's air connectivity in 2024, utilising new, detailed forward-looking and backward-looking databases. The paper evaluates trends in scheduled passenger flights, seat capacity, airline competition and the resulting environmental impact. The analysis shows that with 55,850 scheduled flights connecting Malta to 109 airports across 35 countries, the island has demonstrated significant growth in its aviation network during 2024. Ryanair and KM Malta Airlines dominated operations, contributing nearly 70% of total flights. Seasonal variations significantly influenced flight frequencies and connectivity, with peaks during summer months. Using detailed flight GPS data and hourly weather data, the analysis also examines the environmental costs of aviation, including carbon emissions and noise pollution. Furthermore, with the upcoming removal of free ETS aviation allowances by 2026, this paper finds that one-way ticket prices for flights to and from Malta on average could increase by over €10 per passenger. By utilising such detailed data, the paper provides valuable insights for policymakers to balance the goals of enhancing connectivity and promoting sustainable aviation practices.

JEL classification: L93, Q53, Q58, R41

Keywords: Aviation Policy, Aviation Growth, Carbon Emissions, Sustainable Aviation, Aircraft Operations, Environmental Impact

Table of Contents

Executive Summary

Malta's recent developments in air connectivity were already analysed in a Central Bank of Malta policy note (Sant, 2020). This highlighted significant connectivity growth between 2005 and 2019, largely driven by low-cost carriers. However, the COVID-19 pandemic halved these connections to just 70 in 2020, with reduced flight frequencies and competition. By 2023, connectivity rebounded to 100 direct routes, still below pre-pandemic levels (Sant, 2024).

Building on these findings, this discussion paper provides an updated, in-depth analysis of Malta's air connectivity in 2024. Unlike earlier studies which focused exclusively on the number of connected airports, this paper adopts a more comprehensive approach, evaluating key metrics such as flight frequency and seat capacity. Additionally, it addresses the environmental impact of aviation by calculating the exact impact of noise pollution and the carbon footprint associated with flights operating to and from Malta. The analysis is based on two datasets: a forward-looking database of scheduled passenger flights available for public booking and a backward-looking dataset based on actual flight GPS data of flights operating to or from Malta International Airport.

The paper shows that scheduled passenger flights totalled 55,850, reflecting a highly seasonal trend, with nearly half of the operations concentrated in the May-September peak period. August recorded the highest activity, with 10.4% of total annual flights, while February experienced the lowest. Despite the seasonal drop in winter, flight activity during off-peak months was stronger than in previous years, indicating growing demand for year-round travel.

Ryanair and KM Malta Airlines dominated Malta's scheduled flights in 2024, operating nearly 70% of scheduled flights combined. Ryanair accounted for 47.1% of all flights, with a strong seasonal focus during summer months, while KM Malta Airlines maintained a steadier year-round schedule, reflecting its strategy of providing consistent connections to major European hubs. Other airlines, such as EasyJet and Wizz Air, showed varying degrees of seasonality, with legacy carriers like Lufthansa and Emirates ensuring reliable year-round connections to global transport networks.

Connectivity reached 109 airports in 35 countries in 2024, a recovery from the 70 connections in 2020 but below the 125 airports in 40 countries in 2019. Seasonal variations influenced connectivity, with July and August offering the highest connectivity (108 airports), while winter saw significant drops. While Malta retained year-round links to 30 countries, connections to five others were limited to the summer months due to seasonal leisure demand. Geopolitical factors, such as Russia's invasion of Ukraine further impacted connectivity levels.

Scheduled flights to and from Malta in 2024 provided 10,331,054 seats available across various airlines. Ryanair dominated the market, offering nearly half of the total capacity, followed by KM Malta Airlines, which accounted for 22%. Other airlines, such as Wizz Air and EasyJet, contributed 5% each, while legacy carriers like Lufthansa and Emirates added 3% each. Smaller shares were distributed among Turkish Airlines, Jet2, British Airways, ITA Airways, and others. The significant market share of Ryanair and KM Malta Airlines highlights their central role in shaping Malta's air travel landscape, with other airlines contributing to a more diverse connectivity network.

The distribution of over 10 million seats reflected a wide range of connections, with Rome Fiumicino leading as the top destination (556,543 seats annually), followed by London Gatwick (539,612 seats) and Catania (441,312 seats). Other major European hubs, including Munich, Frankfurt, and London Heathrow, also featured prominently, each offering over 200,000 seats. London emerged as a critical market, with combined seat capacity from Gatwick, Heathrow, and Stansted exceeding 1 million annually, further cementing its role as Malta's key destination. Leisure destinations such as Ibiza and Chania demonstrated significant seasonality, with heightened capacity during summer months.

With regards to countries, Italy and the United Kingdom were Malta's largest markets, collectively accounting for nearly 45% of total seat capacity. Italy led with 2.5 million seats, showing strong year-round demand and seasonal peaks in summer, while the UK offered just under 2 million seats with steadier monthly distribution. Germany, France, and Poland ranked next, highlighting their importance as tourism and business travel markets. Spain, Greece, Switzerland, and Belgium also contributed substantial seat capacities, with stable year-round demand from secondary markets.

In 2025, passenger movements are projected to grow further to 9.3 million. Malta's connectivity is set to surpass pre-pandemic levels, with airlines introducing both new routes and increased competition on existing ones. Announced routes for 2025 include connections to entirely new destinations such as Helsinki, Santorini, Rimini, and Benghazi. Qatar Airways will also reinstate its connection to Doha, a key hub for long-haul travel. Additionally, airlines such as EasyJet, Ryanair, SAS, Volotea and KM Malta Airlines are adding new services to destinations like London Southend, Glasgow, Bordeaux, Copenhagen, Warsaw and Istanbul.

Scheduled passenger flights to and from Malta International Airport generated approximately 1.11 million metric tons of CO2 emissions in 2024, consuming 352 million kilograms of fuel. With the removal of free ETS allowances by 2026, airlines will adopt the polluter-pays principle, increasing ticket prices based on CO_2 emissions. For flights to and from Malta, prices are expected to rise by an average of €10.10 per passenger at an ETS price of €80 per metric ton of CO_2, and €13.92 at €110.

In addition to scheduled passenger flights, total flights from Malta, including private, cargo, and military operations, contributed 1.24 million metric tons of CO2 emissions. Private jets, cargo flights, and other non-scheduled operations accounted for 132,000 metric tons, with private jets alone contributing 25,000 metric tons. Meanwhile, aircraft noise remains a significant environmental concern, especially for communities in close proximity to the airport. Noise levels peaked at 100 decibels in areas closest to the airport, such as Gudja, Luqa, and Kirkop. Villages along primary flight paths, including Birżebbuġa, Qormi, and Attard, experienced elevated noise levels due to concentrated take-off and landing activities.

In the future, capacity constraints, seasonal delays, and compliance with EU environmental regulations pose significant hurdles. Policymakers must prioritize strategies such as fleet modernization, sustainable fuel adoption, and operational efficiency to balance connectivity goals with environmental considerations. This holistic approach is essential to maintaining Malta's air connectivity at a competitive and sustainable level.

1. Introduction

Malta's recent developments in air connectivity were analysed in a 2020 Central Bank of Malta Policy Note[2]. The study highlighted significant route expansion from the Maltese Islands between 2005 and 2019, largely driven by the introduction and growth of low-cost carriers. By 2019, Malta boasted direct connections to 125 airports in 40 different countries, including 118 to mainland Europe, four in the Middle East and three in Africa. The COVID-19 pandemic and the consequent restrictive measures which ensued, drastically impacted this connectivity. In 2020, the number of direct routes fell significantly to just 70. Subsequent research[3] revealed a significant rebound in air connectivity by 2023, with direct connections increasing to 100. However, this figure still fell short of the 2019 levels, underscoring the lingering effects of the pandemic on Malta's air connectivity.

This discussion paper builds on previous work by providing an updated analysis of Malta's air connectivity in 2024. Furthermore, while the previous studies focused exclusively on the number of airports connected to Malta, this paper adopts a more comprehensive approach. It examines not only the number of connected airports but also key metrics such as flight frequency, seat capacity on each route, delay analysis and other critical metrics. Additionally, it addresses the direct environmental impact of aviation by calculating noise pollution and carbon footprint associated with all flights to and from Malta.[4]

The analysis is based on two datasets. The first is a forward-looking database of scheduled passenger flights, focusing on flights available for individual booking by the general public. The second dataset is backward-looking and focuses on actual GPS data from flights that have already occurred at Malta International Airport. This dataset is more comprehensive, as it includes not only passenger flights but also private jets, cargo flights, and other aviation activity.

By integrating these datasets, the paper offers a deeper understanding of Malta's air connectivity, shedding light on its trends and environmental impact. This holistic analysis equips policymakers with valuable insights to inform strategies for enhancing connectivity while addressing the environmental challenges posed by aviation in an increasingly sustainability-focused regulatory context.

The Discussion paper is organised as follows. Sections 2 and 3 provide an in-depth connectivity and seat capacity analysis, respectively, followed by an outlook on 2025 air connectivity in Section 4. Section 5 provides a delay analysis, before moving to carbon footprint calculation of flights in Sections 6 and 7, and a noise pollution analysis in Section 8. The final section summarises and concludes.

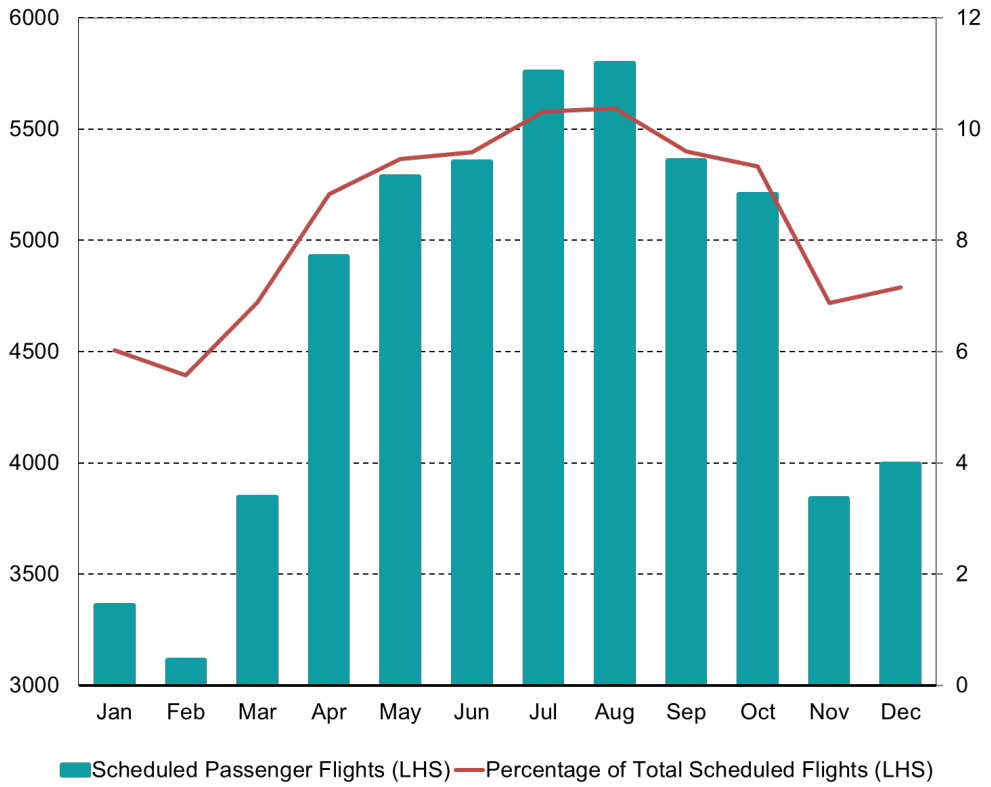
[2] Sant, K (2020), "*An Analysis of Recent Developments in Malta's Air Connectivity*", Policy Note, Central Bank of Malta.
[3] Sant, K (2024), "*Analysing post COVID-19 Air Connectivity and the Implications of a New National Airline*", Quarterly Review Box, Central Bank of Malta.
[4] Note that I only consider the direct environmental impact of aviation. Thus, noise and emissions from ancillary activities such as transport, aircraft maintenance, and airport operations are not estimated.

2. Connectivity Analysis

This section analyses air connectivity to and from Malta serviced by scheduled passenger airlines during 2024. The analysis is based on a newly compiled dataset obtained from various online sources, including Malta International Airport official flight schedules and airline websites. Note that the database focuses exclusively on flights available for individual booking by the general public, thus excluding charter flights or flights offered only as part of wider travel packages. Private jet charters and other types of private flights are also excluded, ensuring that the analysis concentrates solely on air connections which are available to the public for leisure or business travel. Note that for simplicity, any reference to the Maltese national airline, KM Malta Airlines, throughout this analysis, also includes flights operated by its predecessor, Air Malta, which ceased operations on 30th March 2024.

Scheduled passenger flights to and from Malta totalled 55,850 in 2024. As expected, flight operations were highly seasonal, with nearly half (49.3%) occurring during the May-September peak period (see Figure 1). August recorded the highest number of flights, with 5,796 operations, representing 10.4% of the annual total. July followed closely behind, with 5,757 flights, accounting for 10.3% of the year's flights. Despite the typical drop in winter, the off-peak months still saw stronger-than-usual activity. February had the fewest scheduled flights, totalling 3,116, yet demonstrating significant flight operations even during the low season.

Figure 1: Total and Percentage of 2024 Scheduled Passenger Flights

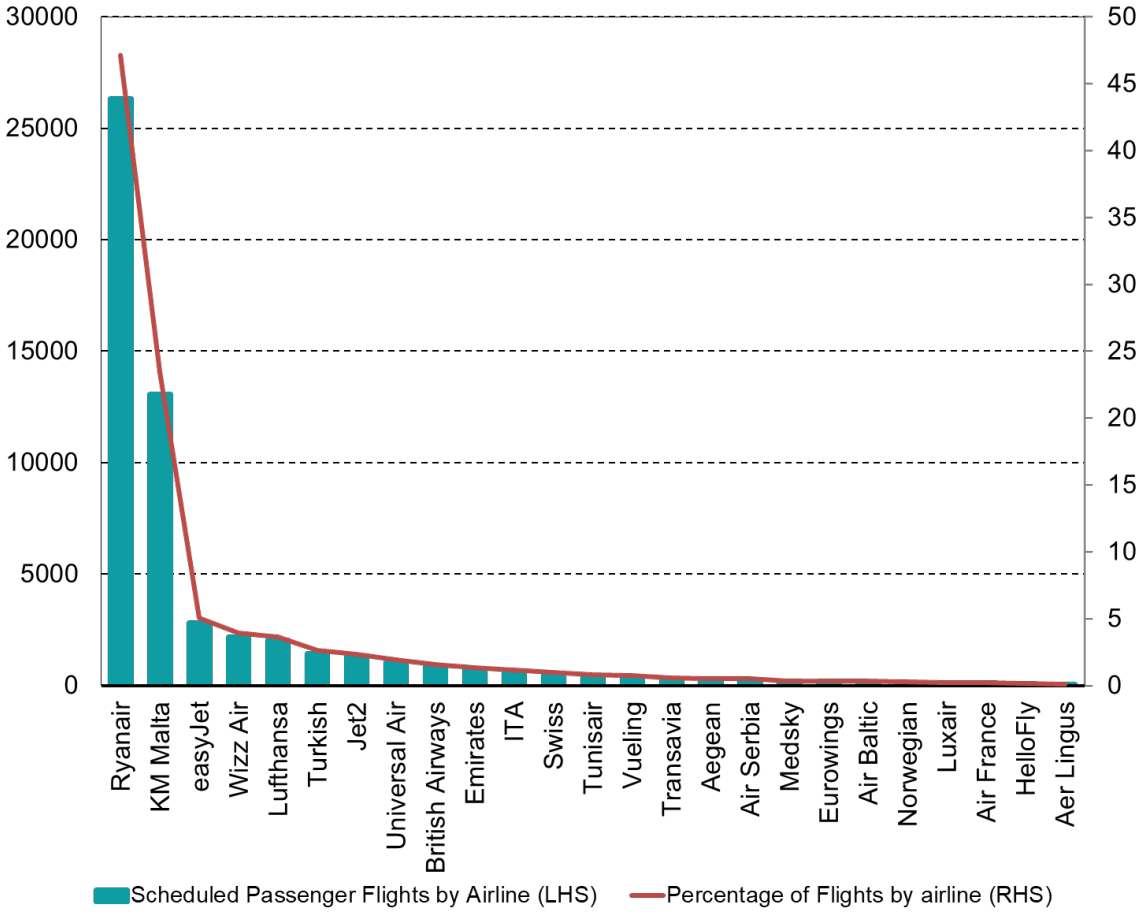


Note: LHS axis shows total number of scheduled passenger flights to/from Malta airport. RHS axis shows monthly scheduled passenger flights as a percentage of total.
Source: Author's Calculations

A total of 25 different airlines operated scheduled flights to and from Malta in 2024, with Ryanair and KM Malta Airlines dominating the market (see Figure 2). Ryanair scheduled 26,312 flights, accounting for nearly half (47.1%) of all scheduled flights. The Maltese national carrier – KM Malta Airlines – followed with 13,072 flights, representing approximately a quarter of the total (23.4%). EasyJet ranked

a distant third, scheduling 2,817 flights (5%), followed by Wizz Air with 2,191 flights (4%), and Lufthansa with 2,030 flights (3.6%).

Figure 2: Total and Share of 2024 Scheduled Passenger Flights by Airline



Note: LHS axis shows total number of scheduled passenger flights to/from Malta airport by airline. RHS axis shows scheduled passenger flights by airline as a percentage of total.
Source: Author's Calculations

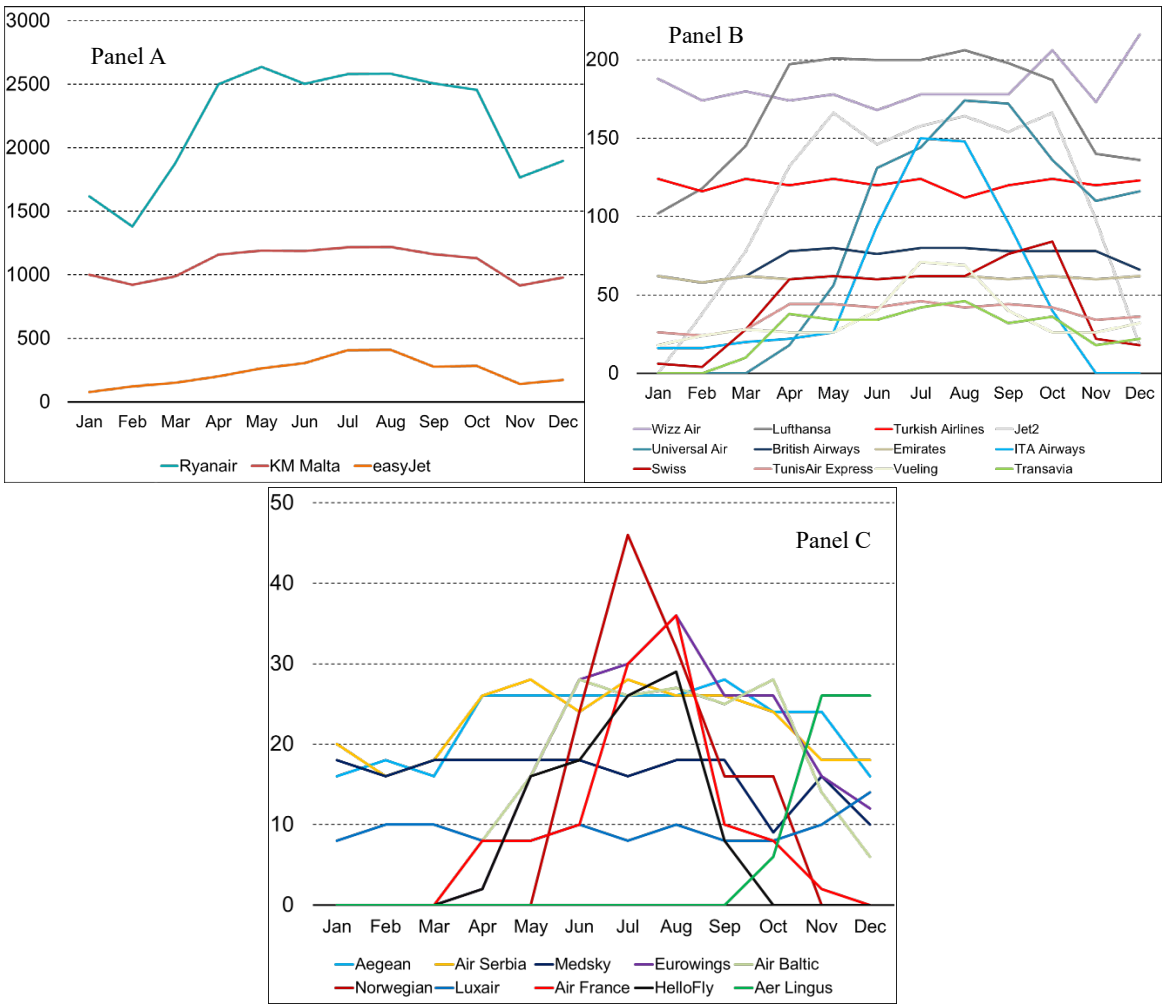
The aforementioned airlines with scheduled passenger flights to and from Malta exhibit varying levels of connectivity throughout the year (see Figure 3). Ryanair maintains a strong presence year-round, with particularly high numbers of scheduled flights during the April-October period, where monthly flights consistently exceed 2,500 (Figure 3, Panel A). This pattern highlights Ryanair's dual focus on providing reliable year-round connectivity, even during the fringe months, while also capitalizing on the intensified seasonal demand during the summer months.

KM Malta Airlines exhibits a more consistent flight schedule with smaller seasonal fluctuations. Although there is a noticeable increase in flights during the April-October period, the variation is less pronounced than Ryanair (Figure 3, Panel A). This reflects the airline's strategy of maintaining steady connections to major European hubs throughout the year, while adding extra flights to such connections during the summer months and the Christmas period to accommodate increased seasonal demand.

Other airlines, including easyJet, Jet2, ITA Airways, Vueling, Norwegian, and Air France, demonstrate highly seasonal operations (Figure 3). These airlines provide minimal or no connectivity during the winter months but significantly increase flights in the summer, reflecting their focus on catering to seasonal demand driven by leisure travel.

In contrast, airlines such as Wizz Air, Turkish Airlines, British Airways, Luxair, and Emirates maintain a consistent flight schedule throughout the year, with relatively stable numbers of monthly flights. This stability reflects their commitment to providing continuous connectivity, regardless of season. Notably, with the exception of Wizz Air, these are primarily legacy or full-service airlines that operate routes to large international hubs. Their consistent schedules underscore their role in connecting Malta to key global and regional transport networks even in the winter months. By offering year-round connectivity to major hubs like London, Istanbul and Dubai, these airlines ensure reliable access to onward connections for both business and leisure travellers.

Figure 3: Monthly Scheduled Passenger Flights to/from Malta by Airline in 2024

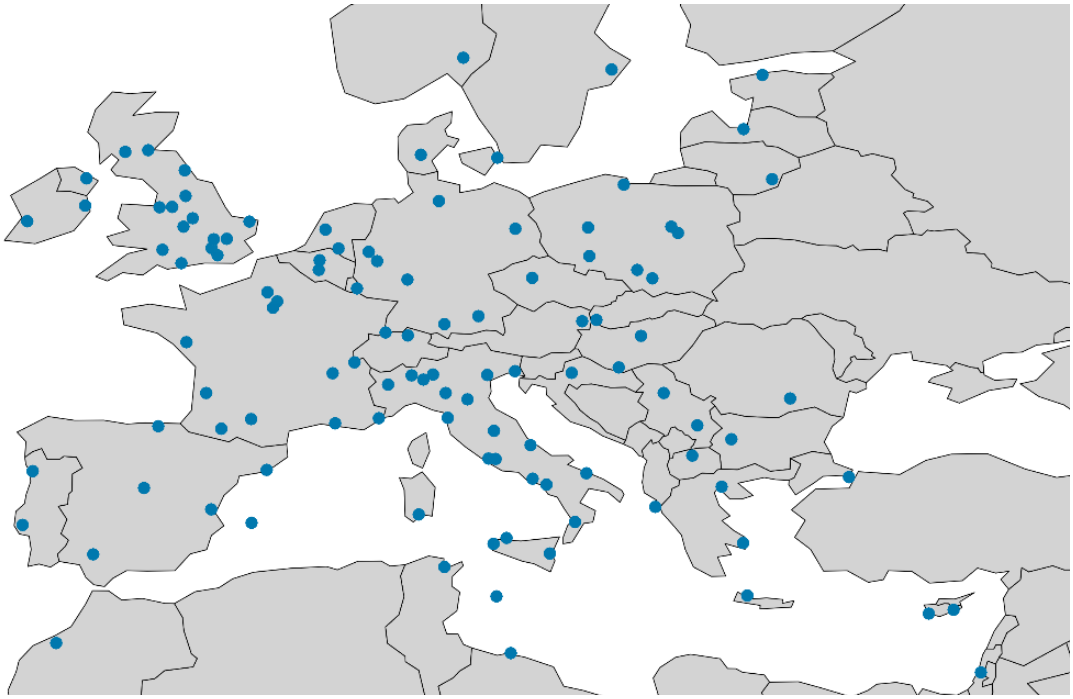


Note: Graphs shows monthly scheduled flights by airline. Panel A focuses on the top 3 airlines (Ryanair, KM Malta and easyJet). Panels B and C focuses on the remaining airlines. Note that the y-axis varies across panels.
Source: Author's Calculations

The 55,850 scheduled flights in 2024 connected Malta to a total of 109 different airports (see Figure 4), marking a significant recovery from the drastic decline in connectivity caused by the COVID-19 pandemic. Prior to the pandemic, Malta had connections to 125 airports in 2019. However, this number dropped sharply to just 70 airports in 2020 (Sant, 2020). By 2023, connectivity had partially recovered to 100 airports (Sant, 2024). This analysis now shows that airport connectivity has continued to improve, albeit still not returning to pre-pandemic 2019 connectivity levels.

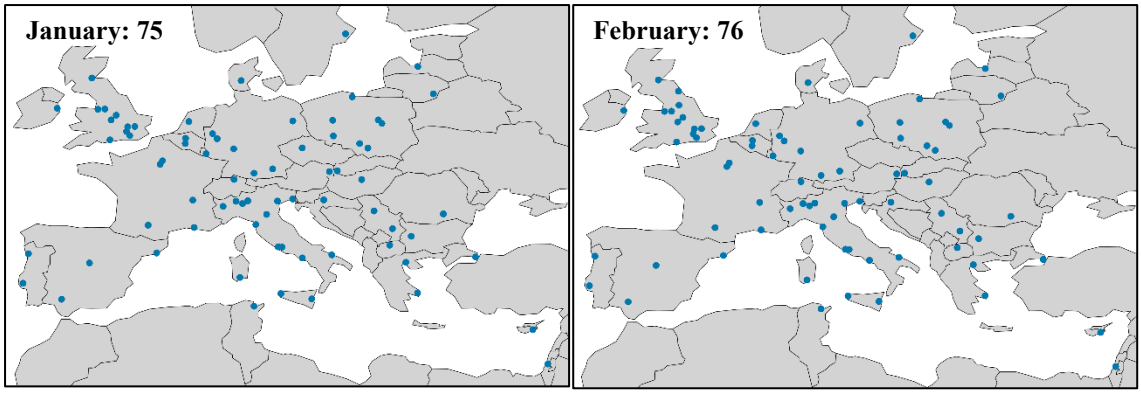
The seasonality of scheduled flights significantly affects connectivity levels throughout the year. Figure 5 illustrates that while the total number of airports connected to/from Malta reached 109 over the year, connections peaked at 108 during the busiest months of July and August, closely followed by September (107) and June (106). In contrast, during the low-season months, connectivity drops sharply, with only 75 connections in January and 77 in December. This highlights that seasonality impacts not only the frequency of routes but also the total number of connections from Malta to other airports.

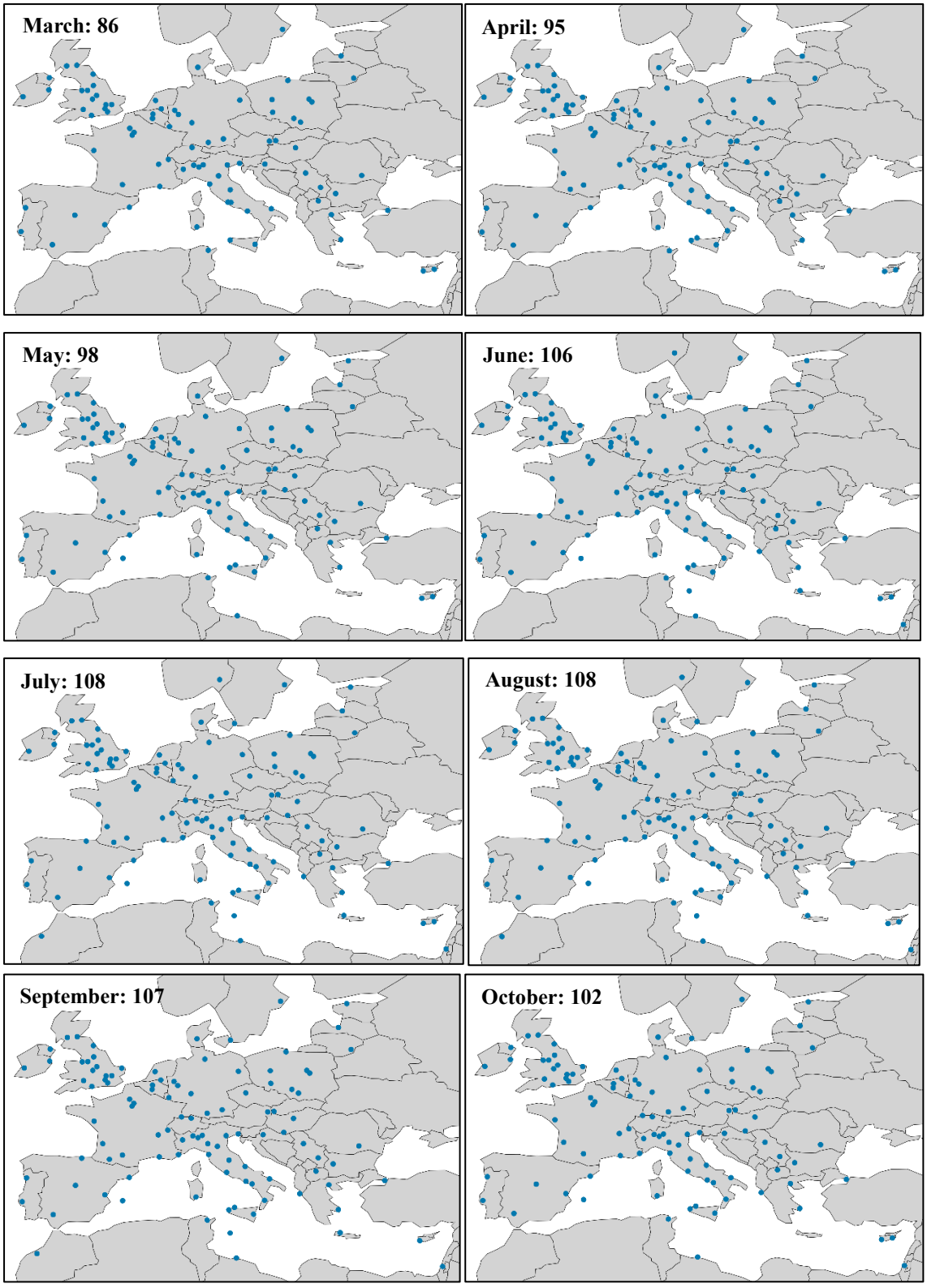
Figure 4: 2024 Scheduled Passenger Flights to/from Malta by Airport

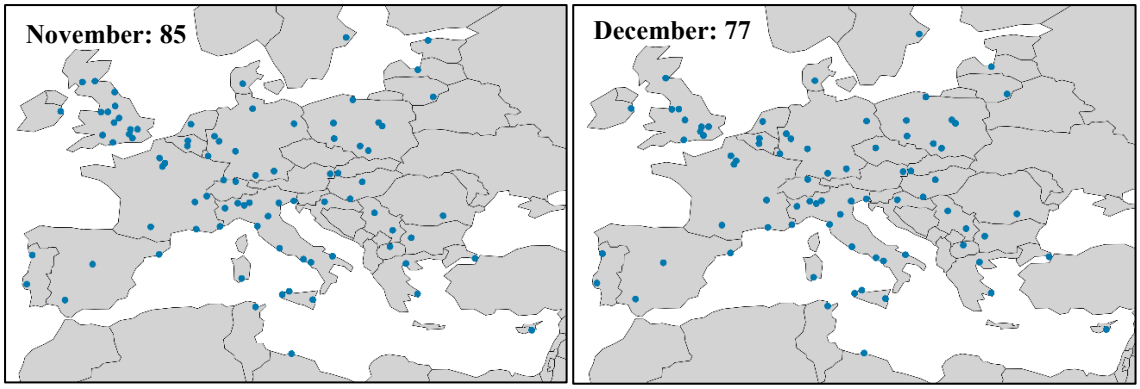


Note: Blue points on figure shows airports directly connected to Malta at any point during 2024. Dubai (DXB) airport is not shown since it includes a stopover at Larnaca (LCA) airport.
Source: Author's Calculations

Figure 5: 2024 Scheduled Passenger Flights by Airport and by Month




March: 86
April: 95
May: 98
June: 106
July: 108
August: 108
September: 107
October: 102



Note: Panels in figure are by month. Blue points on figure shows airports directly connected to Malta in the respective month. Dubai (DXB) airport is not shown since it includes a stopover at Larnaca (LCA) airport.
Source: Author's Calculations

In 2024, Malta maintained scheduled flights to 35 different countries (Figure 6), reflecting the extensive reach of its aviation network. Among these, 30 countries, including key markets such as Italy, the UK, Germany, France, Poland, and Spain, enjoyed year-round connectivity. Other nations with continuous connections included Greece, Switzerland, Belgium, Turkey, Austria, Hungary, the Netherlands, Cyprus, the United Arab Emirates, Serbia, Ireland, Croatia, Romania, Portugal, Tunisia, Bulgaria, Latvia, Slovakia, North Macedonia, Lithuania, Luxembourg, Denmark, Libya, and Sweden.

Figure 6: 2024 Scheduled Passenger Flights to/from Malta by Country

Note: Teal intensity illustrate volume of scheduled passenger flights to/from Malta to the respective country. Lighter shades of teal illustrate less scheduled passenger flights, whilst darker shades illustrate more scheduled passenger flights during 2024.
Source: Author's Calculations

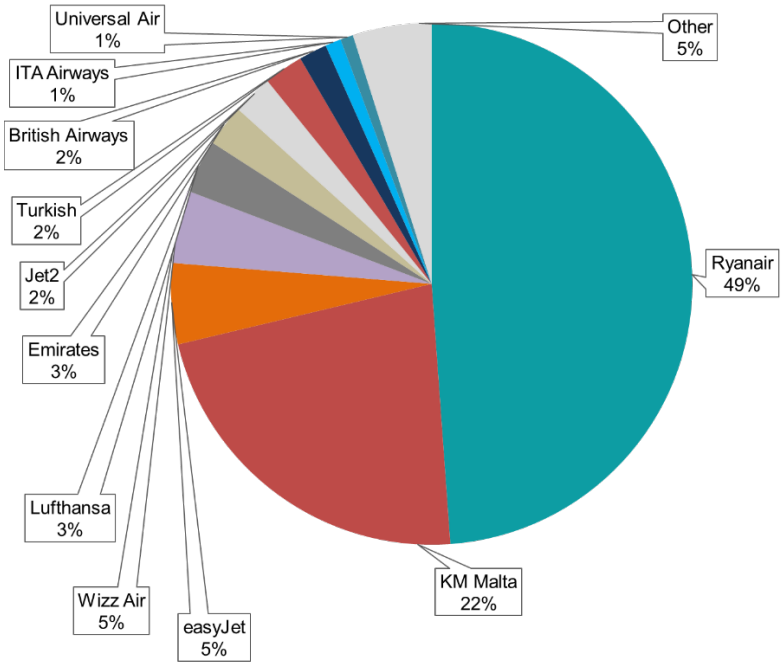
However, 5 countries—Czech Republic, Israel, Estonia, Norway, and Morocco—experienced a loss of connectivity outside the summer months, highlighting the seasonal nature of air travel in these markets. This was particularly pronounced for Norway and Morocco, which had scheduled flights to and from Malta for only three months during the peak summer season. The limited duration of connections to these countries reflects the highly seasonal demand from these regions, which may be driven primarily by leisure travel during warmer months.

It is worth noting, however, that the 35 countries connected to Malta in 2024 are still fewer than the 40 countries with scheduled flights in 2019, prior to the COVID-19 pandemic. However, some of this decline is attributed to geopolitical factors such as Russia's invasion of Ukraine which resulted in the suspension of Malta's connections to Kyiv, St. Petersburg, and Moscow, removing connectivity to both Ukraine and Russia.

3. Seat Capacity Analysis

In 2024, the 55,850 scheduled flights by the 25 different airlines resulted in a total of 10,331,054 seats being offered for sale to/from Malta across the several airports and countries analysed above. Ryanair dominated the market, providing 5,047,495 seats, which accounted for around half of the total seat capacity offering to/from Malta (see Figure 7). Despite operating a small fleet and serving few destinations, KM Malta Airlines remained in a clear second place, offering 2,315,280 seats and accounting for 22% of total seat availability.

Figure 7: 2024 Seat Capacity on flights to/from Malta by Airline



Note: The Figure illustrates seats available for sale on scheduled passenger flights to/from Malta by airline as a percentage of total seats available.
Source: Author's Calculations

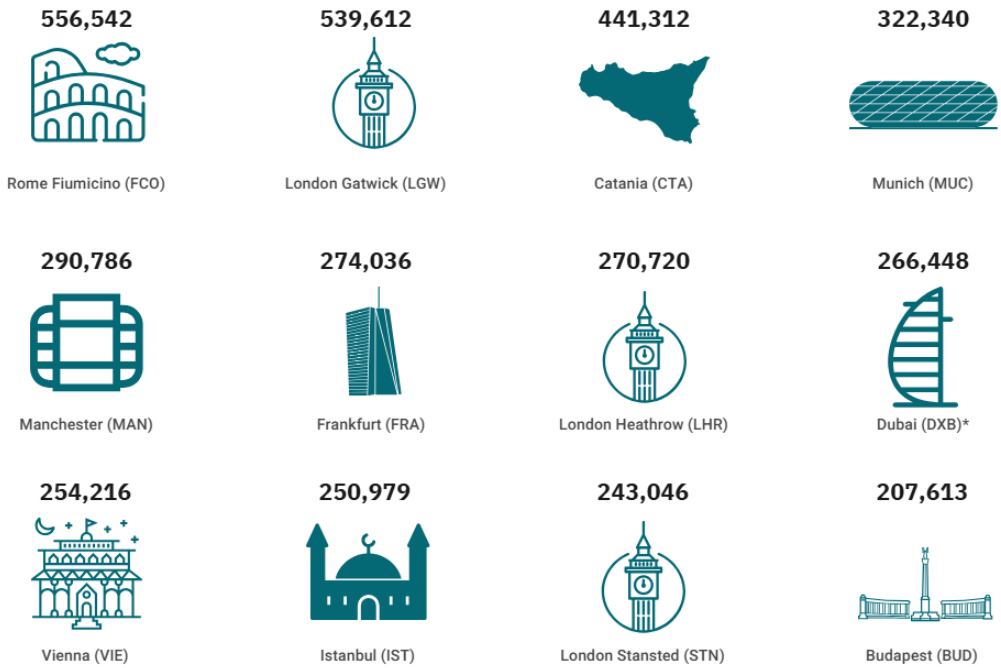
Other airlines also played a notable role in Malta's connectivity. Low-cost carriers such as Wizz Air and easyJet each contributed 5% of total seat capacity. Lufthansa and Emirates followed with a 3% share each, reflecting their focus on specific routes and connecting hubs. Turkish Airlines, Jet2, and British Airways each offered 2% of the total seats. Meanwhile, ITA Airways and Universal Air contributed smaller shares of 1% each. The remaining 5% seat capacity was spread across other airlines. This distribution underscores the prominent role of a few key players, particularly Ryanair and KM Malta Airlines, in shaping the country's air travel market, while other carriers contribute to the broader connectivity network.

The over 10 million available seats to and from Malta were distributed across a diverse range of connections. As illustrated in Figure 8, Rome Fiumicino airport ranked as the top destination, offering the largest seat capacity at 556,542 seats throughout the year. This strong capacity was driven by consistent seat offering across all months, emphasizing its importance as a leading connection for Malta. London Gatwick airport closely followed with 539,612 seats offered, with Catania airport in third with 441,312 seats.

Other major European hubs, such as Munich, Frankfurt, London Heathrow, and Istanbul also featured prominently, each exceeding 200,000 seats annually, together with Dubai. These airports underscore Malta's strong connectivity to some of the busiest aviation hubs. Additionally, cities such as Manchester, Vienna and Budapest demonstrated substantial seat offerings, highlighting their popularity as leisure destinations for travellers to and from Malta.

Notably, London Stansted airport also emerged among the top-ranked airports, alongside Gatwick and Heathrow. Based on these three airports alone, the total seat capacity between Malta and London as a city exceeded 1 million seats in 2024. Moreover, this total does not account for other London airports, such as London Luton, which also contribute significantly to Malta's connectivity with the UK capital, further emphasizing London's dominant position as a key destination.

Figure 8: 2024 Seat Capacity for top airports for flights to/from Malta

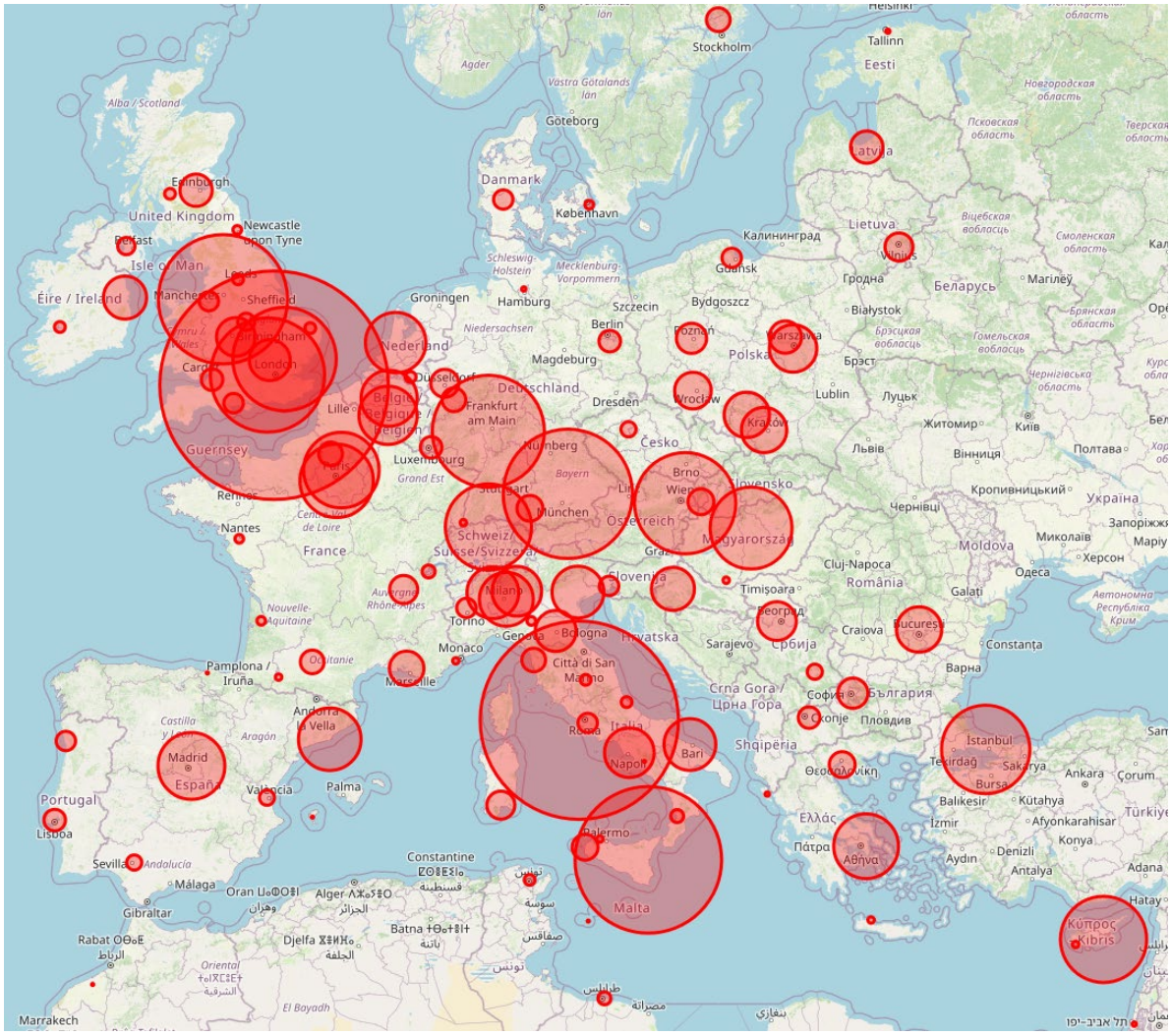


Note: Figure shows total seats available for sale on scheduled passenger flights to/from Malta by airport.
**Dubai Airport (DXB) connection includes a stopover at Larnaca Airport*
Source: Author's Calculations

The airports discussed above are however just a small snapshot of the largest seat offerings to and from Malta. Figure 9 elaborates further to show that thousands of other seats were offered to a wide variety of destinations, with the larger the circle on the figure, the larger the seat capacity to/from that particular airport. Whilst the above-mentioned airports can clearly be identified due to the large circle size – thus showing the high seat capacity to such destinations – the figure shows significant seat capacities to other cities all year round, especially to Madrid, Athens, Paris, Barcelona, Bari, Naples, Milan and Amsterdam, amongst others.

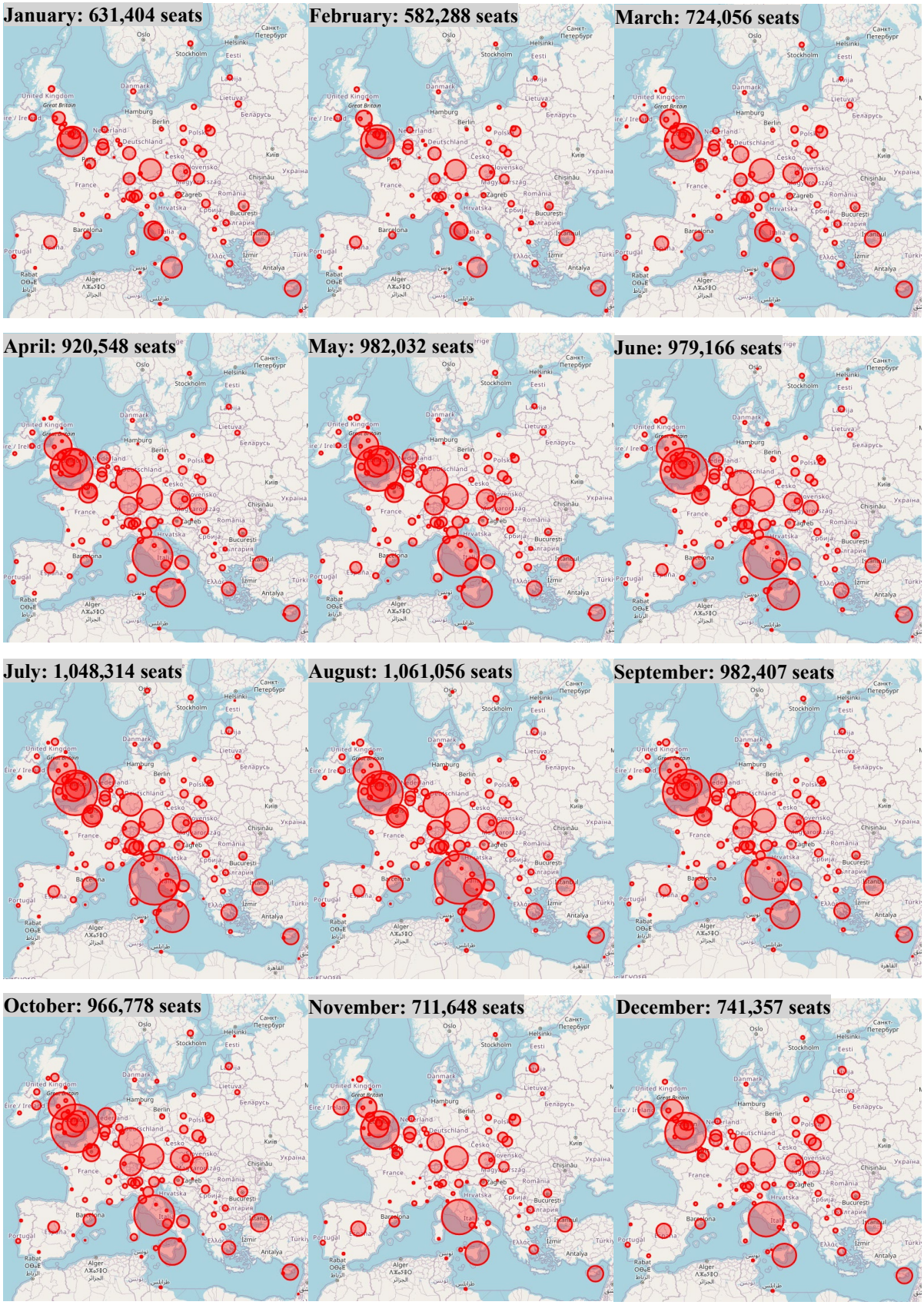
The data also reveal significant seasonal fluctuations for seat capacities (see Figure 10). The seasonality effect is even more pronounced for leisure-focused destinations. Airports such as Ibiza, Chania and Paphos operate exclusively during the summer season, serving the heightened demand for leisure travel in summer.

Figure 9: 2024 seat capacity for flights to/from Malta by Airport



Note: Circle size indicates seat capacity levels. Larger circles show higher seat capacity availability on scheduled passenger flights to/from Malta. Connection to Dubai (DXB) not shown on map since it includes a stopover at Larnaca (LCA).
Source: Author's Calculations

Figure 10: 2024 Monthly Seat Capacity for flights to/from Malta by Airport



Note: Circle size indicates seat capacity levels. Larger circles show higher seat capacity availability on scheduled passenger flights to/from Malta. Connection to Dubai (DXB) not shown on map since includes stopover at Larnaca.
Source: Author's Calculations

In terms of country seat capacity, a total of 2,496,283 seats were available on flights to and from Italy, far surpassing any other country (see Figure 11). Seat capacity to Italy remained consistently high throughout the year, although peaking during the summer months. July and August offered over 276,000 seats per month, compared to a low of 129,326 in February.

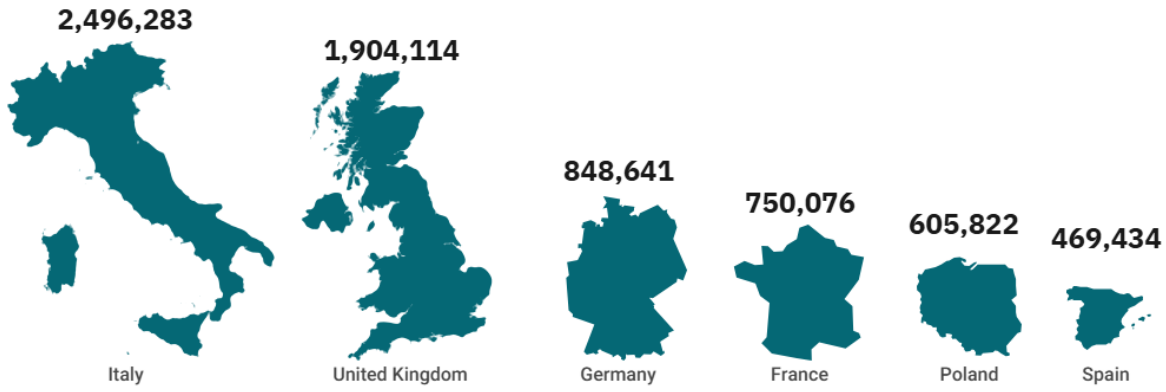
The United Kingdom was the second largest market, with 1,904,114 seats available in 2024. Monthly seat capacities to the UK were more stable, ranging from 102,968 seats in January to a peak of 188,848 in May. Germany ranked third, with 848,641 seats available across the year. The German market exhibited notable seasonality, with summer months offering over 90,000 seats per month compared to just under 50,000 in February.

France and Poland followed with 750,076 and 605,822 seats, respectively. French connectivity, like Germany, exhibited seasonal peaks, reflecting the importance of tourism-driven travel. Polish connectivity, on the other hand, showed a more stable distribution of seat capacity, indicative of the growing strength of Poland as a year-round market.

Spain and Greece contributed 469,434 and 295,816 seats, respectively. Spain's seat capacity showed a steady climb during the spring and summer months, driven by the popularity of Mediterranean leisure travel. Switzerland and Belgium also feature prominently, each with over 270,000 seats annually, highlighting their roles as strong secondary markets. These countries demonstrated consistent capacity across the year, with relatively smaller fluctuations compared to larger markets like Italy and the UK.

Thus, Malta's seat capacity in 2024 highlights the critical importance of Italy and the UK, which together accounted for nearly 45% of total seat capacity. The remainder of the network demonstrates a mix of strong European markets like Germany, France, and Poland, complemented by smaller but significant contributions from Switzerland, Belgium, and other regional players. This diversity ensures Malta's position as a well-connected destination within Europe, although there remains potential to further develop niche and new connections to broaden its air connectivity.

Figure 11: 2024 seat capacity for flights to/from Malta by Country



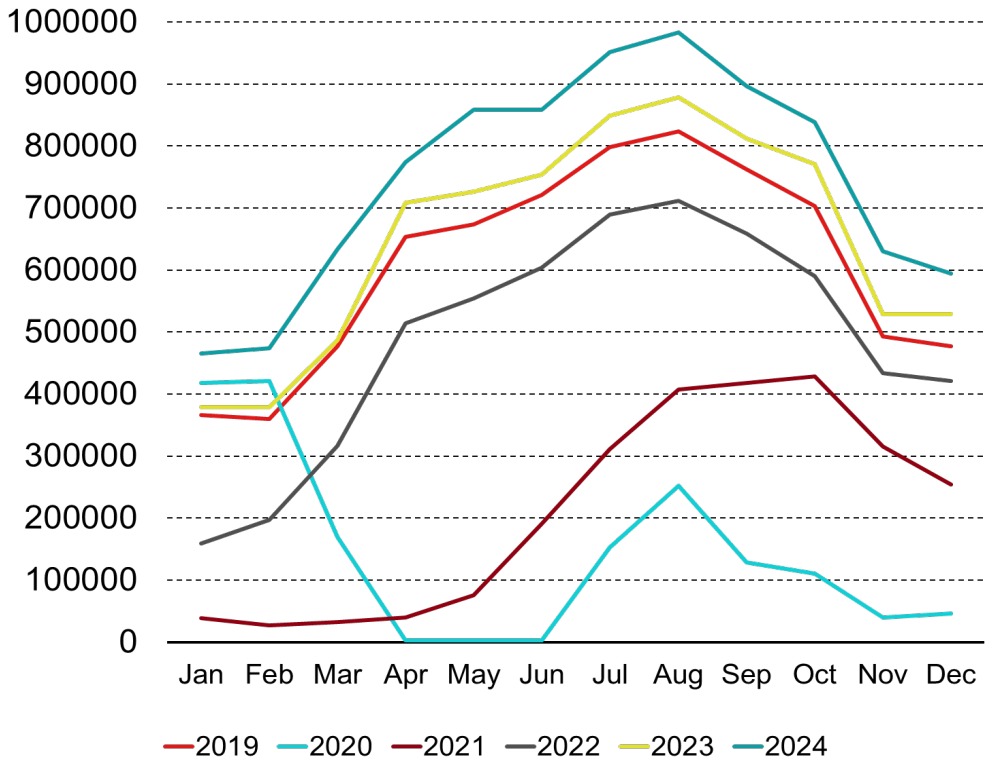
Source: Author's Calculations

4. 2025 Connectivity Outlook

Despite 2024 still falling short of pre-pandemic levels in terms of the number of connected airports and countries, it was a record-breaking year for air passenger movements. This achievement was driven by increased frequencies on existing routes, higher seat load factors throughout, and the use of higher-capacity aircraft by airlines. A total of 8.96 million passenger movements were recorded during the year, reflecting a 15% growth compared to 2023 (see Figure 12). Notably, much of this growth occurred during

the off-season, with passenger traffic in the winter months rising by 20%. Summer traffic also experienced robust growth, with a 12% increase in passenger movements.

Figure 12: Passenger movements to/from Malta Airport (2019-2024)



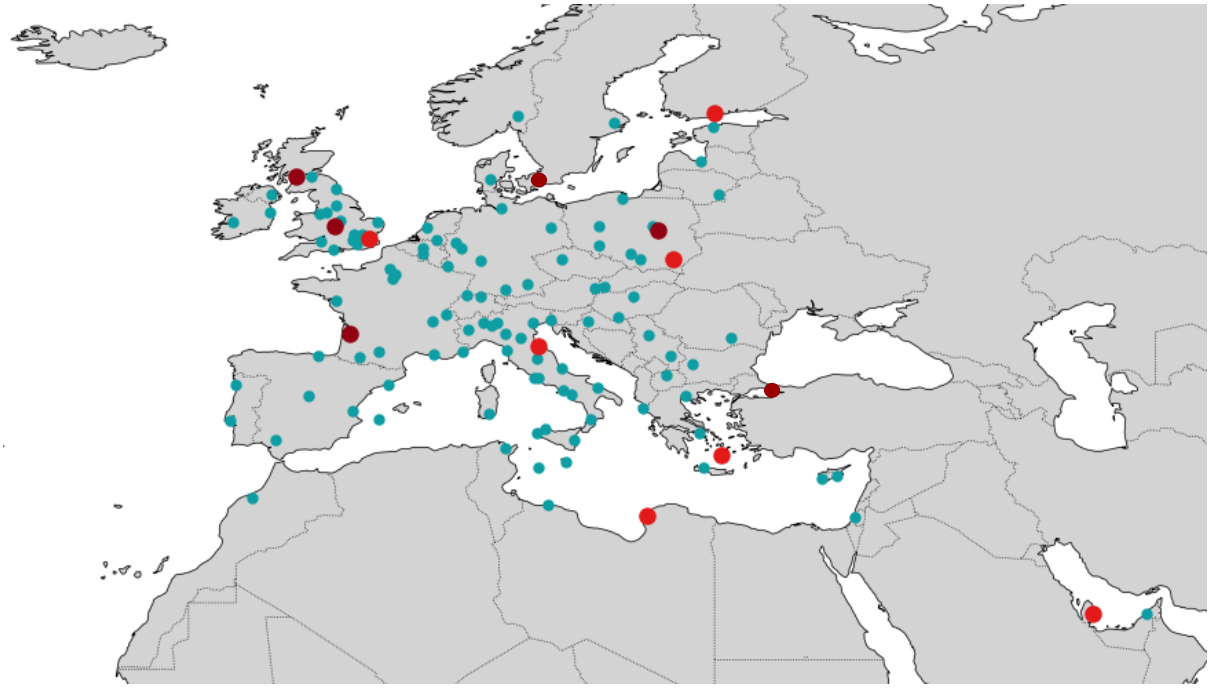
Note: Graph shows monthly passenger movements to/from Malta International Airport for 2019-2024.
Source: Malta International Airport (2025)

Looking ahead to 2025, Malta International Airport expects to welcome around 9.3 million passengers, an increase of over 300,000 passengers over 2024 (Malta International Airport, 2025). In terms of connectivity, while not all airlines have finalised their spring/summer schedules, and additional routes may still be introduced for the autumn/winter season, early indications suggest that Malta's air connectivity will continue to climb to pre-pandemic levels. Figure 13 provides a snapshot of Malta's existing connections in 2024, represented by teal points, alongside newly announced routes for 2025.

The dark red points in Figure 13 illustrate new routes announced for 2025 to airports already served by other airlines. For example, easyJet has announced a new route to Birmingham Airport, which is already served by Jet2, TUI and Ryanair. Similarly, Volotea plans to connect Malta to Bordeaux, currently served by Ryanair, while LOT Polish Airlines has announced a route to Warsaw Chopin airport, which is already served by Wizz Air. Ryanair will also introduce a new route to Glasgow, complementing existing services by Jet2. SAS announced a new route to Copenhagen, complementing existing services by Norwegian. Finally, KM Malta Airlines has announced that, starting in 2025, it will launch flights to Istanbul, a route already served by Turkish Airlines. These additions are expected to increase competition on these routes, whilst offering passengers greater choice in terms of flight times and dates.

New connections announced for 2025 are shown in light red points in Figure 13. EasyJet introduced a route to London Southend Airport, thus intensifying the seat capacity offering from Malta to London as a city. Norwegian Air Shuttle will connect Malta with Helsinki. Ryanair has announced a new route to Rzeszow, and Universal Air is set to introduce services to Santorini and Rimini. Meanwhile Libyan airline Medsky Airways announced a new route to Benghazi, complementing its already existing Libyan route to Tripoli. Finally, a particularly significant development is the return of Qatar Airways' connection to

Figure 13: Existing 2024 connections and new 2025 connections from Malta



Note: Teal points show airports served to/from Malta by scheduled passenger airlines in 2024. Light red points illustrate new connections for 2025. Dark red points illustrate new airlines flying to already existing destinations.
Source: Author's Calculations

Doha. This route, a key link to a major Middle Eastern hub, was lost during the 2020 pandemic and had been present as recently as 2019. Its reintroduction not only restores access to a crucial global gateway but also enhances opportunities for long-haul connectivity for travellers to and from Malta.

5. The Carbon Footprint of Scheduled Passenger Flights

Based on the newly compiled dataset and through the use of a carbon emission calculation approach tailored to Malta and based on the ICAO Carbon Emissions Calculator Methodology (2024) – which considers actual distances flown, aircraft types, engine types and seat load factors – we estimate that scheduled passenger flights to and from Malta International Airport in 2024 consumed 351,977,437 kilograms of fuel. This corresponds to 1,112,248,702 kilograms (or 1,112,248 metric tons) of CO2 emissions.

Table 1: Expected Price Impact of ETS on One-Way Flights to/from Malta

Airline	Total ETS Cost (€80)	ETS Cost per passenger (€80)	Total ETS Cost (€110)	ETS Cost per passenger (€110)
Total	**88,979,896**	**10.10**	**122,347,357**	**13.92**

Source: Author's Calculations

With the scheduled removal of free ETS allowances for airlines by 2026, the aviation industry will fully transition to the polluter-pays principle. Airlines will be required to purchase ETS allowances based on their CO_2 emissions, introducing a significant cost factor into ticket pricing. This analysis evaluates the potential impact on per-passenger ticket prices if these costs are passed fully onto consumers. The results, detailed in Table 1, consider total CO_2 emissions, seat capacity, and seat load factors across flights. Two scenarios are explored: one with an ETS allowance price of €80 per metric ton of CO_2 (approximately the price as of January 2025) and another with an ETS price of €110 per metric ton of

CO_2 (reflecting the historical peak). It is important to note that this analysis exclusively examines price increases stemming from ETS costs. Other factors that could further elevate ticket prices—such as rising aviation fuel taxes or mandatory adoption of Sustainable Aviation Fuel (SAF)—are not included in this assessment. On average, one-way flights to and from Malta are expected to see price increases of €10.10 per passenger at an ETS price of €80 per metric ton of CO_2. This rises to €13.92 per passenger if the ETS price increases to €110 per metric ton of CO_2.

Box 1: Fleet Modernisation and Emission Reduction – A 2024 Case Study on KM Malta Airlines

2024 was a particularly important year for Maltese aviation, with Air Malta – the longstanding Maltese flag carrier since 1974 – being replaced by a new flag carrier, KM Malta Airlines, on 31 March 2024. The new carrier took over Air Malta's then fleet of six young AirbusA320neo aircraft (with the oldest aircraft just 6 years old), and two older Airbus A320 aircraft, already in operation for over 12 and 17 years, respectively. However, from its inception, KM Malta Airlines emphasized its commitment to developing a new business plan focused on an efficient network and a modernized fleet.

To this end, one of the airline's immediate priorities was to replace the two older Airbus A320 aircraft with brand-new Airbus A320neo models during 2024. The A320neo (with neo referring to "New Engine Option") offers significant advantages over its predecessor, the A320, including up to 20% better fuel efficiency, quieter operations with noise levels reduced by approximately 50%, and a longer operational range.

These plans have since materialized, with the seventh Airbus A320neo, registered 9H-NEH, joining the KM fleet on 23 July 2024, and the eighth Airbus A320neo, registered 9H-NEG, entering service in early October 2024. Both aircraft replaced the older A320 models inherited from Air Malta, ensuring that KM Malta Airlines closed the year with a homogeneous fleet of eight Airbus A320neo aircraft. With an average fleet age of just 2.5 years, KM Malta Airlines now operates one of the youngest and most modern fleets in Europe, enhancing its competitiveness while reducing its environmental footprint.

This modernization is particularly critical in the context of the European Union's Fit for 55 initiative, which aims to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. Aviation, as a significant contributor to emissions, is under increased scrutiny. In fact, the phased removal of free allowances under the EU Emissions Trading System (ETS) for airlines by 2026 will place greater financial pressure on carriers to adopt more sustainable operations. By transitioning to the highly efficient Airbus A320neo, KM Malta Airlines is proactively addressing these challenges, ensuring compliance with tightening regulations while minimizing operational costs and emissions.

With these developments, an analysis of the 2024 flight dataset used in this paper reveals that KM Malta Airlines operated approximately 73% of all flights (9,919 flights) using the newer, more efficient Airbus A320neo aircraft during 2024. The remaining flights (3,573 flights) were conducted using the two older Airbus A320 models retained from the Air Malta fleet, as well as wet-leased Airbus A320s and Boeing 737-800s, especially during the peak summer months. Note that a small portion of KM Malta Airlines flights – 54 flights (<0.4%) – could not be analysed due to data issues. Using a carbon emission calculation approach tailored to Malta and based on the ICAO Carbon Emissions Calculator Methodology (2024), which accounts for actual distances flown, aircraft types, and seat load factors, we estimate that KM Malta Airlines flights in 2024 consumed 78,749,527 kilograms of fuel. This corresponds to 248,848,508 kilograms (or 248,849 metric tons) of CO2 emissions. Note that this estimate differs from the figures analysing scheduled KM Malta flights since this analysis includes all KM flights, including flights flown as charters.

In this context, to better understand the environmental and economic impact of KM Malta Airlines' fleet modernization, this box analyses the fuel burn and CO_2 emission savings resulting from the transition to a young and modern fleet. To do so, we analyse two alternative scenarios. The first scenario estimates the fuel burn and CO_2 emissions that would have been generated in 2024 if KM Malta Airlines

had operated an all-Airbus A320 fleet. This reflects the composition of the fleet prior to modernization and aligns with the fleet structure still employed by many European airlines today. Then, the second scenario evaluates the fuel burn and CO_2 emissions assuming all 2024 flights were operated exclusively by Airbus A320neo aircraft. This scenario represents a fully modernized fleet of eight A320neo aircraft and anticipates fleet operations projected for 2025. However, it is important to note that wet-leased aircraft will still rely on older Airbus A320 models in the near term.

Thus, this comparison will allow us to estimate the fuel burn savings, CO_2 emission reductions, and potential cost savings in the future under the EU Emissions Trading System (ETS) as free allowances are phased out by 2026. By analysing these scenarios, we can quantify the benefits of KM Malta Airlines' investment in a modern fleet and its alignment with EU climate targets.

Table 3 summarizes the findings of this analysis. In 2024, if Air Malta and KM Malta Airlines had exclusively operated older Airbus A320 models, the total fuel consumption would have reached 90,257,950 kilograms, resulting in approximately 285,215 metric tons of CO_2 emissions. However, with its six Airbus A320neo aircraft, and through limiting the older Airbus A320 models to just 27% of flights, the airline achieved a significant reduction in environmental impact. Specifically, it saved 11,508,422 kilograms of fuel, equating to 36,367 metric tons of avoided CO_2 emissions during 2024.

Under Scenario 2, where the airline hypothetically operates all flights with the A320neo model (including wet-leased flights), additional savings are projected. The total fuel consumption would decrease by a further 3,835,430 kilograms compared to the current fleet composition (a cumulative reduction of 15,343,852 kilograms compared to Scenario 1). This would correspond to an additional 12,120 metric tons of CO_2 emissions avoided (a total reduction of 48,487 metric tons compared to Scenario 1).

Beyond the environmental and ethical benefits of reduced fuel burn and emissions, these improvements bring substantial financial advantages to the airline. Fuel savings translate directly into cost reductions, as fuel typically accounts for 20% to 30% of an airline’s total operating expenses. Depending on jet fuel prices, these savings can significantly lower the airline’s operating costs. Moreover, with the EU’s initiative to increase the adoption of Sustainable Aviation Fuels (SAF), reducing fuel consumption becomes even more critical. SAF currently costs up to two and a half times more than conventional jet fuel, meaning higher fuel usage would further escalate operating expenses. By minimizing fuel burn, the airline can better manage costs in an era of increasing SAF adoption.

Moreover, in light of the removal of free ETS allowances for airlines by 2026, carriers will operate under the polluter-pays principle, requiring them to purchase ETS allowances based on their CO_2 emissions. Table 2 illustrates the cost implications of this change, assuming an ETS allowance price of €80 per metric ton of CO_2 (approximately the price as of January 2025).

Under Scenario 1, where the airline operates an all-Airbus A320 fleet, the ETS expense would reach nearly €23 million. However, in the real-life scenario, KM Malta Airlines achieves a €3 million saving, reducing the ETS cost to just under €20 million. If the airline were to operate an all-A320neo fleet, the ETS expense would further decrease to below €19 million, representing an additional €1 million in savings. Should the ETS allowance price increase—since prices fluctuate and allowances are traded on the market—the financial benefits of these savings could become even more significant (Table 2).

In conclusion, KM Malta Airlines’ investment in a modern, fuel-efficient fleet has delivered substantial environmental benefits, significantly reducing the airline’s carbon footprint. By transitioning to cleaner Airbus A320neo aircraft, the airline has not only aligned itself with EU climate targets under the Fit for 55 initiative but has also proactively reduced its exposure to escalating carbon costs under the EU Emissions Trading System.

Table 2: Fuel Burn, CO2 Emissions and ETS Costs of KM Malta Airlines flights

Scenario	Fuel Burn (Million KG)	Difference (Million KG)	CO2 Emissions (Million KG)	Difference (Million KG)	ETS Cost: €80 per allowance (Million €)	Difference (Million €)	ETS Cost: €110 per allowance (Million €)	Difference (Million €)
Scenario 1: All A320 fleet	90.3		285.2		€22.8		€31.4	
2024 Scenario: 6 A320neo and 2 A320 aircraft	78.8	-11.5	248.8	-36.4	€19.9	-€2.9	€27.4	-€4.0
Scenario 2: All A320neo fleet	74.9	-15.3	236.7	-48.5	€18.9	-€3.9	€26.0	-€5.3

Source: Author's Calculations

From a financial perspective, this analysis focuses specifically on the cost savings derived from lower fuel consumption and reduced ETS-related expenses. While these factors contribute to long-term financial sustainability, it is important to acknowledge that they represent only part of the broader economic considerations involved in fleet modernization. Other key financial aspects—such as differences in leasing versus purchase costs, the capital expenditure required for new aircraft, and variations in maintenance expenses—also play a crucial role in determining the overall financial impact of this transition. The decision between leasing and purchasing aircraft, in particular, can have significant implications for cash flow, flexibility, and long-term cost efficiency.

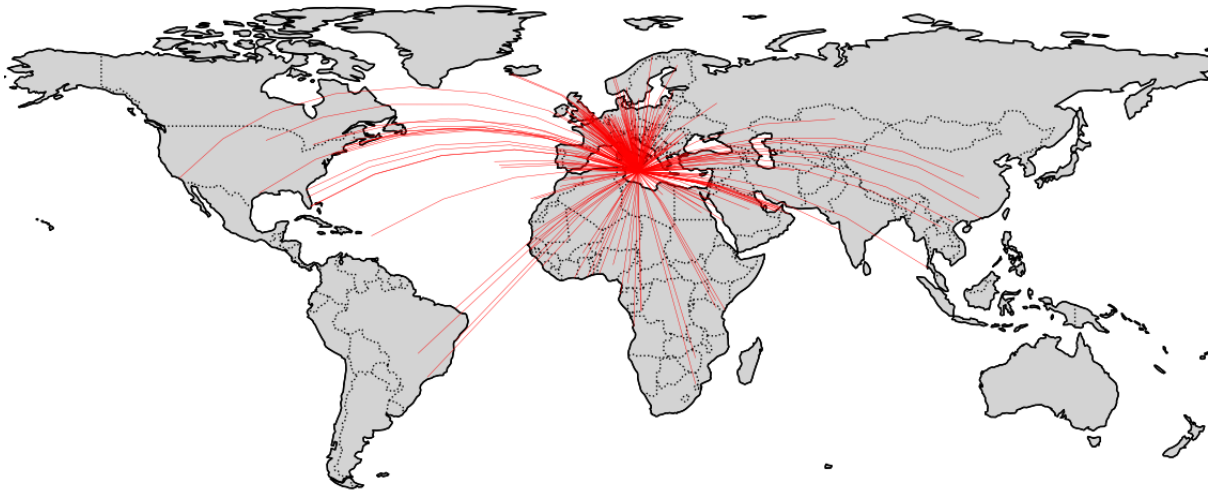
Thus, while the shift to a more fuel-efficient fleet provides clear advantages in terms of fuel cost reductions and ETS compliance, a comprehensive financial assessment must also take into account these additional factors. Ultimately, these considerations will influence the airline's ability to manage operational costs, maintain competitive airfares, and sustain profitability in a highly competitive aviation industry.

6. The Carbon Footprint of All Flights from Malta Airport

While the section above focused on the carbon footprint of scheduled passenger flights, flight activity at Malta International Airport extends beyond these operations. The dataset compiled for this analysis identifies an additional 11,276 flights to and from Malta. After excluding flights operated by helicopters, as well as light aircraft and microlights—primarily used for flight training and leisure—this leaves a further 10,285 flights connecting Malta to various locations worldwide (see Figure 14). As a result, the total number of flights to and from Malta in 2024 amounts to 66,135 flights.

Of these flights, 4,113 (6%) were operated by private jets, which are typically small, luxury aircraft used for business travel or personal use, offering flexibility and exclusivity (see Figure 15). 2,776 flights were classified as other commercial flights, including charter flights (non-scheduled services arranged for specific groups or purposes), aircraft arriving for maintenance operations, and other miscellaneous non-scheduled flights

Figure 14: Route Map of all Flights to/from Malta International Airport in 2024



Note: Map illustrates all flights to/from Malta International Airport during 2024, including business jets, cargo aircraft, air force aircraft, air ambulance flights and government flights.
Source: Author's Calculations

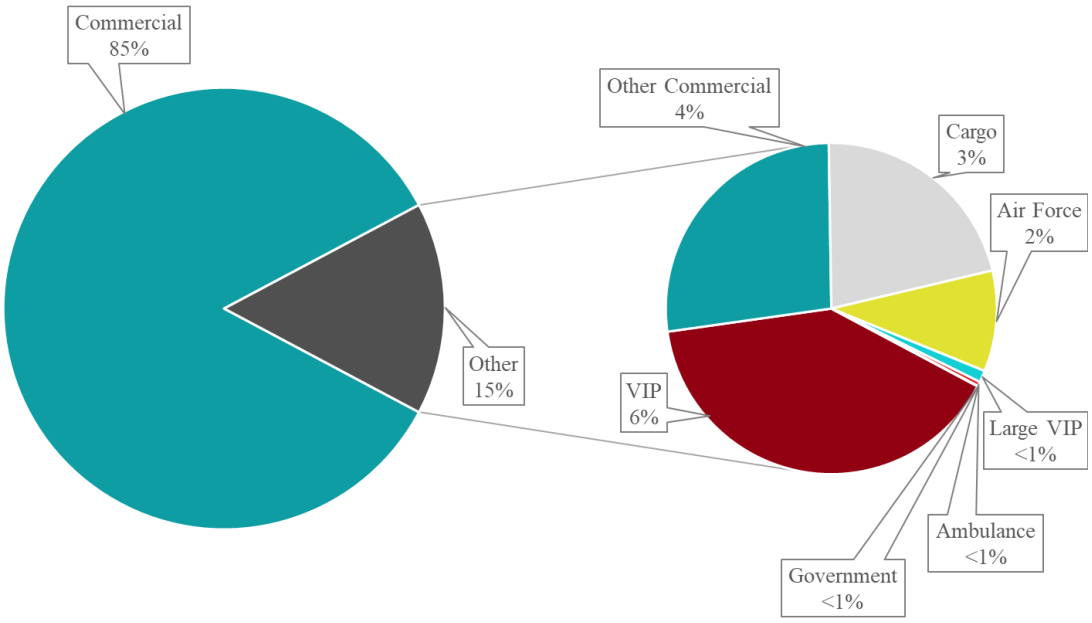
.Cargo flights, accounting for 2,216 flights (3%), are specialized aircraft designed to transport freight and goods, often connecting Malta to international logistics hubs. Additionally, 1,013 flights (2%) were conducted by military aircraft operated by various air forces worldwide, typically for defence-related operations, training, or logistical purposes.

Other categories included 119 flights by large VIP planes, wide-body aircraft reconfigured for use by luxury use, 44 flights operated by air ambulances, which are specially equipped aircraft for medical emergencies, and 4 flights by official government aircraft, used for diplomatic or state purposes. Each of these categories represented less than 1% of the total flight activity.

Using the methodology outlined above, the more than 66,000 flights to and from Malta International Airport in 2024 resulted in the consumption of approximately 394 million kilograms of fuel, releasing a total of 1,244 million kilograms (1.24 million metric tons) of CO2 into the atmosphere (see Table 3).

Breaking this down by flight type, business jets contributed 25.3 million kilograms of CO2 emissions, reflecting their relatively low passenger capacity but high operational frequency. Cargo flights accounted for the highest emissions among non-scheduled services, releasing 44.8 million kilograms of CO2, closely followed by other commercial aircraft flights, which produced 44.5 million kilograms of CO2. These include charter and maintenance-related operations. Flights operated by air forces worldwide emitted 3.2 million kilograms of CO2, while large VIP flights, often used by state officials or prominent individuals, contributed 2.8 million kilograms. Finally, air ambulance flights and government aircraft flights produced 0.2 million kilograms and 0.1 million kilograms of CO2 emissions, respectively.

Figure 15: Percentage of total flights to/from Malta Airport by type of flight



Note: Figure shows percentage of total flights to/from Malta airport by type of flight, with a focus on non-scheduled passenger flights. The LHS pie chart illustrates scheduled passenger commercial flights (85%) of all flights, while the RHS pie chart focuses on the other 15% of all flights, divided into other commercial flights, VIP business jet flights, Cargo flights, Air Force flights, Large VIP flights, Air Ambulance flights and Government aircraft flights.
Source: Author's Calculations

Table 3: Carbon Footprint of flights to and from Malta Airport in 2024

Flight Type	Fuel Burned (KG)	CO_2 Emitted (KG)
Scheduled Passenger Flights	351,977,437	1,112,248,702
VIP (Business Jet) Flights	8,010,065	25,311,805
Cargo Flights	14,167,531	44,769,398
Other Commercial Aircraft Flights	14,086,561	44,513,531
Air Force Flights	1,024,086	3,236,112
Large VIP Flights	896,020	2,831,422
Air Ambulance Flights	74,048	233,992
Government Flights	34,478	108,951
Total	**393,721,048**	**1,244,158,511**

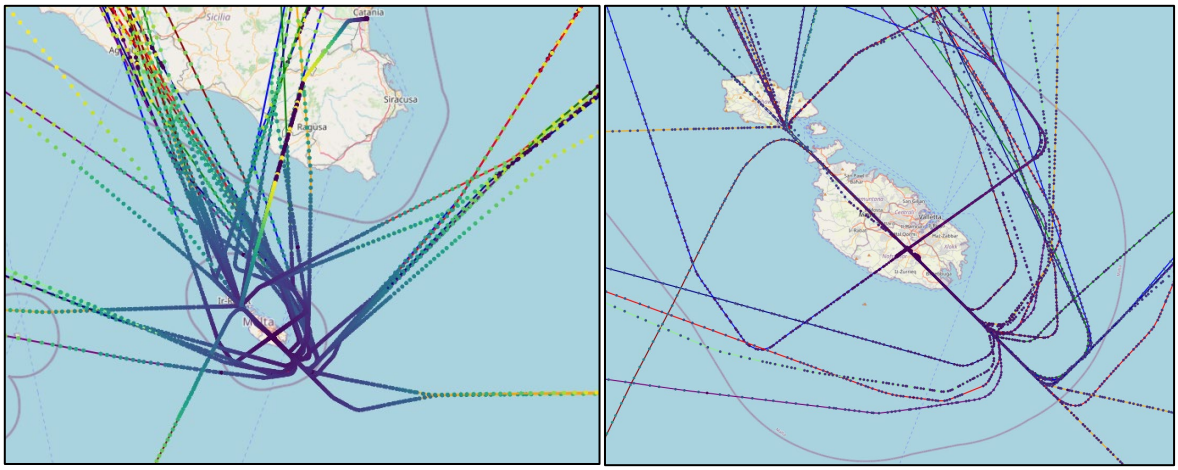
Source: Author's Calculations

7. Noise Pollution Analysis

In addition to carbon emissions, noise pollution from aviation is another significant source of environmental pollution associated with air transport, particularly in areas near airports and flight paths. Aircraft noise is generated by multiple sources, including engine operation during take-off, landing, and taxiing, as well as aerodynamic noise caused by airflow over the aircraft's surface. This noise not only disrupts the daily lives of people living in the proximity to airports, but can also have broader health implications, such as increased stress levels and sleep disturbances.

In Malta, noise pollution from aviation is significant, particularly for villages situated around Malta International Airport and under its primary flight paths. While flights from and to Malta operate to various countries, and therefore approach the island from different areas (see Figure 16), they ultimately converge into a standardized approach route dictated by air traffic control. The specific landing and departure paths are primarily determined by wind conditions, as aircraft must align with the runway direction that offers the safest and most efficient operation. This means that certain areas of the island experience concentrated noise exposure depending on the prevailing wind patterns. The impact is particularly noticeable during peak travel seasons or periods of sustained activity, where the continuous frequency of flights amplifies the overall noise burden.

Figure 16: Flight Approaches to/from Malta Airport in 2024



Note: Figure shows incoming and outgoing flight paths of flights operating to/from Malta Airport in 2024.
Source: Author's Calculations

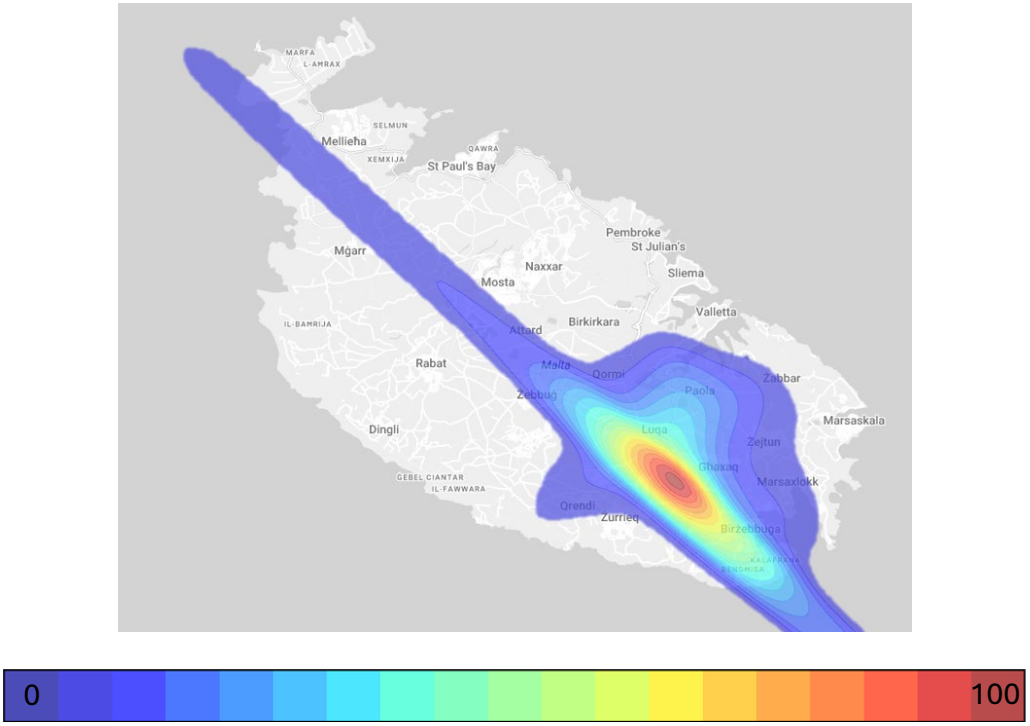
Utilizing actual flight GPS data combined with a database of hourly wind conditions for Malta, this analysis examines the noise pollution generated by flights to and from Malta International Airport in 2024. The heatmaps presented below are computed by carefully considering flight GPS data, the types of aircraft used, and wind conditions at Malta Airport during the specific take-off or landing time of each flight. Figure 17 provides a comprehensive snapshot of noise pollution generated by flights to and from Malta International Airport in 2024. The highest decibel levels are concentrated around the airport itself, where takeoff, landing, and taxiing activities result in intense noise pollution in the immediate vicinity. Villages such as Gudja, Luqa, and Kirkop experience consistent noise from nearly all aircraft operations, at a maximum of 100 decibels.

The increased takeoffs and landings on Runway 31 contribute to elevated noise levels in the southeastern part of Malta, with Birżebbuġa particularly impacted by aircraft noise pollution. Meanwhile,

significant activity in the northwestern areas results in notable noise exposure in villages such as Ħal-Farruġ, Żebbuġ, Qormi, and Attard.

Additional noise pollution, stemming from activity on Runways 05 and 23, as well as wind-related noise propagation, affects other regions. In the southwestern direction, villages such as Mqabba, Siġġiewi, and Qrendi experience varying levels of sound pollution. Similarly, in the northeastern direction, villages including Paola, Fgura, Tarxien, and Santa Luċija are impacted. Wind conditions play a significant role in the propagation of noise, further amplifying the effects in these areas.

Figure 17: Noise Pollution from flights to/from Malta Airport in 2024 (decibels)



Note: Figure shows noise pollution heatmaps for all flights departing or arriving at Malta International Airport in 2024. Noise heatmap is shown by colour, with dark red illustrating 100 decibels, and dark blue illustrating values close to 0 decibels.
Source: Author's Calculations

8. Conclusion

Using detailed forward-looking and backward-looking databases, this paper shows that with 55,850 scheduled flights connecting Malta to 109 airports across 35 countries, the island has demonstrated significant growth in its aviation network. However, connectivity remains below the peak levels of 2019. Low-cost carriers, particularly Ryanair, and KM Malta Airlines have been instrumental in shaping this recovery, offering a balance between seasonal and year-round connections. However, challenges such as seasonal fluctuations, infrastructure constraints, and environmental concerns continue to shape Malta's aviation landscape.

Environmental sustainability is a critical area of focus, as the aviation sector remains a significant contributor to carbon emissions. In 2024, scheduled flights to and from Malta emitted approximately

1.11 million metric tons of CO_2, with Ryanair accounting for the largest share due to its high operational volume. Addressing these environmental challenges will require investments in fleet modernization, the adoption of sustainable aviation fuels (SAFs), and enhanced operational efficiency.

Looking ahead, the EU's regulatory initiatives, including the Aviation Emissions Trading System (ETS), RefuelEU Aviation, and the Single European Sky, will undoubtedly impact Malta's connectivity landscape. The phased removal of free ETS allowances by 2026 will increase operational costs for airlines, compelling them to adopt more fuel-efficient technologies and practices. RefuelEU Aviation, which mandates the gradual blending of SAFs into jet fuel, will further drive costs for airlines operating in Malta, especially given the higher price of SAFs compared to conventional fuel. Additionally, the Single European Sky initiative, aimed at optimizing airspace use and reducing delays, could bring operational efficiencies that benefit Malta's aviation sector. However, these regulations will also pose challenges for smaller carriers and highly seasonal routes, potentially affecting the cost and frequency of flights to and from Malta. This paper finds that on average, flights to and from Malta are expected to see ticket price increases of €10.10 per passenger at an ETS price of €80 per metric ton of CO_2, rising to €13.92 per passenger at €110, further emphasizing the need for strategic adjustments in the industry.

Looking forward, the analysis highlights opportunities for growth and challenges that must be addressed to ensure sustainable development. New routes announced for 2025, including connections to Doha, Helsinki, and Santorini, signal further expansion of Malta's air network. However, infrastructural constraints at Malta International Airport, seasonal delays, and compliance with EU environmental regulations pose significant hurdles. Policymakers must prioritize strategies such as fleet modernization, sustainable fuel adoption, and operational efficiency to balance connectivity goals with environmental considerations. This holistic approach is essential to maintaining Malta's connectivity as a competitive and sustainable aviation hub in the Mediterranean.

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