

Transport

Roads and Bridges

Macao has 347.2 kilometres of roads and highways, including 190.1 kilometres on the Macao peninsula; 91.3 kilometres on Taipa Island and Cotai; 44.4 kilometres on Coloane; 2.9 kilometres in New Urban Zone Area A and the bridge connected with New Urban Zone Area A; 8.7 kilometres in the Zhuhai-Macao border crossing area on the Artificial Island of the Hong Kong-Zhuhai-Macao Bridge; 4.6 kilometres in the campus of the University of Macau (including the cross-river tunnel); and 1.5 kilometres in the Macao border crossing area and related extension zones of the Hengqin checkpoint.

Three bridges and a strip of reclaimed land link the Macao peninsula with Taipa island and Coloane island. Opened to traffic in October 1974, the Nobre de Carvalho Bridge (also known as the Macao-Taipa Bridge) is 2.5 kilometres long. The 4.4-kilometre Friendship Bridge was completed in April 1994. The 2.1-kilometre Sai Van (West Bay) Bridge was completed in December 2004 and opened to traffic in January 2005. In addition, the 800-metre Lotus Flower Bridge was completed in December 1999 and opened to traffic in March 2000. Linking the reclaimed area between Taipa and Coloane with Zhuhai City's Hengqin island and connected to the Guangzhou-Zhuhai Expressway, this bridge is the second land route between Macao and its neighbouring cities.

Macao has 468.9 kilometres of roads for motor vehicles. This figure includes 204.5 kilometres on the Macao peninsula; 151.2 kilometres on Taipa island and Cotai; 68.7 kilometres on Coloane island; five kilometres on Nobre de Carvalho Bridge; 10.2 kilometres on the Friendship Bridge; 4.2 kilometres on the Sai Van Bridge; 1.6 kilometres on the Lotus Flower Bridge; 5.6 kilometres in New Urban Zone Area A and the bridge connected with New Urban Zone Area A; and 17.9 kilometres in the Zhuhai-Macao border crossing area on the Artificial Island of the Hong Kong-Zhuhai-Macao Bridge. There are also 14 kilometres of roads of the University of Macau (including the cross-river tunnel) and three kilometres in the Macao border crossing area and related extension zones of the Hengqin checkpoint.

Public Transport

Macao has a well-established public transport network connecting the Macao peninsula and the two islands. A variety of vehicles, including buses, taxis and light rail transit, are available for local residents and tourists.

Public Bus Service

Public bus service in Macao is currently operated by two bus companies: Transportes Urbanos de Macau, S.A.R.L. (Transmac) and Sociedade de Transportes Colectivos de Macau, S.A. (TCM).

At the end of 2022, there were 1,110 buses in service – 115 minibuses, 230 medium-sized buses and 765 large buses, on 85 routes. In 2022, a total of 168 million passengers were served, representing a decrease of 12.8 percent over the 2021 figure, covering a total distance of 47.9 million kilometres, representing a decrease of 4.35 percent over the 2021 figure.

The Government signed the amendment to the concession contract regarding the Public Service of Road Mass Transport for the first and fourth tender sections and the amendment to the concession contract regarding the Public Service of Road Mass Transport for the third tender section with Transportes Urbanos de Macau, S.A.R.L. (Transmac) and Sociedade de Transportes Colectivos de Macau, S.A. (TCM), respectively. The two companies provide bus services under the new contracts starting from 1 January 2021, for a period of six years.

Sociedade de Transportes Colectivos de Macau, S.A.

Sociedade de Transportes Colectivos de Macau, S.A. (TCM) (previously known as Companhia de Transporte de Passageiros entre Macau e as Ilhas) has been providing public services since the 1950s. With over 60 years of developmental history, TCM is one of the two bus companies approved by the MSAR Government and the only second-tier enterprise under the state-owned Nam Kwong (Company) Limited, which is headquartered in Macao.

TCM operates 57 of the MSAR Government's Section III public bus routes, accounting for 64 percent of routes operated in Macao, with 280,000 (330,000 pre-pandemic) passengers served per day and an average total distance of 70,000 kilometres covered each day.

TCM will adhere to the vision of "Building a Low Carbon Macao and Embracing a Green Life" proposed by the MSAR Government as its corporate development principle, and continue to introduce new models and environmentally friendly buses, aiming to provide safe, fast and quality bus services for Macao residents and the public.

Transportes Urbanos de Macau, S.A.R.L. (Transmac)

Transportes Urbanos de Macau, S.A.R.L. (Transmac) was previously known as Companhia de Autocarros Fok Lei. Founded in 1952, it was restructured and changed its name to Transportes Urbanos de Macau in July 1988. It is the largest bus company in Macao. The company introduced the ISO Quality Management System in 2004 for overall management, making it the first franchised bus company in Macao to pass the ISO 9001:2015 Quality Management System. In 2022, Transmac received the Industry and Commerce Merit award from the MSAR Government.

Transmac has around 1,070 employees and a fleet of over 400 buses that serve 36 bus routes covering Macao, Taipa and Coloane islands. During 2022, 78,643,739 passengers were carried and 22,279,334 kilometres covered.

To keep in line with the Government's environmental protection policies, Transmac introduced the first extended range electric bus in Macao in 2018. Transmac will continue introducing more energy efficient vehicles that are suitable for Macao.

Macao Light Rapid Transit Corporation Limited

The Government established the Macao Light Rapid Transit Corporation Limited in accordance with By-law No. 8/2019. Macao Light Rapid Transit Corporation Limited is mainly responsible for building and maintaining the infrastructure and facilities necessary for the operations of the

Light Rapid Transit system, as well as the LRT operation management and provision of passenger services. Other extended services include advertising and commercial services. The company is committed to supporting the Government's public transportation policy, thereby elevating people's quality of life and convenience in commuting.

The Macao LRT Taipa line officially commenced operation in December 2019. The line is 9.3 kilometres long, with 11 stations, covering the major residential areas, old districts, and tourist spots of downtown Taipa, linking Macao's three major ports of entry by sea, land and air.

Taxis

At the end of 2022, Macao had 1,389 licensed black taxis and 300 special taxis. There were 7,169 licensed taxi drivers.

Traffic Management

Transport Bureau

The Transport Bureau was established in May 2008. It is responsible for: studying, planning, promoting and implementing the Government's road transport policies; pursuing road improvements; regulation of vehicles; as well as installing, maintaining and improving transportation and pedestrian infrastructure.

Vehicle Statistics

At the end of 2022, there were 249,581 vehicles on Macao's roads, including 128,196 motorcycles, 114,066 light vehicles and 7,319 heavy vehicles. During the year, 10,603 new vehicles were registered, 15.1 percent less than in 2021. Of these, 5,861 were motorcycles and 4,044 were cars.

Traffic Monitoring

Traffic management and monitoring are essential for ensuring the safe and orderly operation of the transport system. The Government has installed closed circuit TV (CCTV) and radar speed monitoring systems to monitor traffic conditions on the Macao-Taipa Bridge and main roads.

The system includes 48 video cameras and 11 speed monitoring systems on and near the Friendship Bridge, 111 video cameras and 21 speed monitoring systems on and near the Sai Van Bridge and surroundings, and 14 video cameras and four speed monitoring systems on and near the Ponte Governador Nobre de Carvalho. Also, there are 743 video cameras and 87 speed monitoring radar units; a comprehensive system of 89 monitors at road junctions to detect speeding, vehicles jumping red lights and driving in contravention of road markings; as well as 20 monitors to detect illegal parking, installed in various locations. On the Macao artificial island of Hong Kong-Zhuhai-Macao Bridge, 57 video cameras have been installed.

According to the Public Security Police, during 2022 the monitoring systems identified 9,370

cases of speeding on highways, 1,423 cases of speeding along the bridge, 4,661 cases of jumping red lights, and 17,089 cases of illegal parking.

Parking

As at 31 December 2022, Macao had 62 public car parks, which together provided 25,927 parking spaces for light vehicles, 595 spaces for heavy vehicles, and 18,522 spaces for motorcycles.

Public Car Parks in Macao	
Name of car park	Available parking spaces
Pak Lane Car Park	507 light vehicles
Pak Tou Car Park	211 light vehicles
Pak Lai Car Park	355 light vehicles
Pak Lik Car Park	417 light vehicles
Pak Lok Car Park	411 light vehicles, 300 motorcycles
Pak Vai Car Park	502 light vehicles
Pak Kai Car Park	208 light vehicles
Pak Wai Car Park	1,019 light vehicles
Pak Keng Car Park	161 light vehicles
Alameda Dr. Carlos d'Assumpcao Car Park	720 light vehicles
Pak Wu Car Park	644 light vehicles, 196 motorcycles
Pak Kong Car Park	287 light vehicles, 35 heavy vehicles
Sewage Treatment Plant Car Park	276 light vehicles, 452 heavy vehicles
Vasco da Gama Garden Car Park	179 light vehicles, 154 motorcycles
Iao Hon Park Multi-Storey Car Park	406 light vehicles, 404 motorcycles
Art Garden Car Park	351 light vehicles, 446 motorcycles
Ferreira do Amaral Roundabout Car Park	247 light vehicles, 580 motorcycles
Ho Yin Garden Car Park	415 light vehicles, 542 motorcycles
Malaca Street Car Park	215 light vehicles, 563 motorcycles

(Cont.)

Public Car Parks in Macao	
Name of car park	Available parking spaces
S. Lourenco Market Car Park	60 light vehicles, 74 motorcycles
Estrada Flor de Lotus Heavy Vehicle Car Park	108 heavy vehicles
Macao Science Center Car Park	415 light vehicles, 413 motorcycles
Lido Car Park	62 light vehicles, 24 motorcycles
Transport Bureau Car Park	148 light vehicles, 178 motorcycles
Cheng Choi Building Car Park	304 light vehicles, 518 motorcycles
Mong Sin Block Car Park	133 light vehicles, 231 motorcycles
Almirante Sergio Road Car Park	155 light vehicles, 106 motorcycles
Fai Fu Building Car Park	215 light vehicles, 194 motorcycles
Flor de Lotus Road Car Park	416 light vehicles, 512 motorcycles
Tranquilidade Road Car Park	58 light vehicles, 93 motorcycles
Parque Central da Taipa Car Park	1,343 light vehicles, 1,379 motorcycles
The Taipa Temporary Ferry Terminal Car Park	740 light vehicles, 196 motorcycles
Edificio Mong In Car Park	143 light vehicles, 237 motorcycles
Edificio do Lago Car Park	678 light vehicles, 1,132 motorcycles
Edificio Koi Nga Public Car Park	307 light vehicles, 366 motorcycles
Edificio Ip Heng Public Car Park	389 light vehicles, 606 motorcycles
Edificio Cheng Chong Public Car Park	244 light vehicles, 386 motorcycles
Edificio Lok Kuan Public Car Park	362 light vehicles, 550 motorcycles
Rua da Ponte Negra Public Car Park	95 light vehicles, 80 motorcycles
Fai Yat Building Public Car Park	259 light vehicles, 228 motorcycles
Cheng Chun Building Car Park	54 light vehicles, 38 motorcycles
Cheng I Building Car Park	283 light vehicles, 286 motorcycles

(Cont.)

Public Car Parks in Macao	
Name of car park	Available parking spaces
Iat Seng Building Car Park	292 light vehicles, 315 motorcycles
Chun Shu Mei Car Park	197 light vehicles, 197 motorcycles
Vala Das Borboletas Car Park	369 light vehicles, 165 motorcycles
Iat Fai Building Car Park	59 light vehicles, 132 motorcycles
Alameda da Harmoniai Car Park	209 light vehicles, 146 motorcycles
Rua da Bacia Sul Car Park	306 light vehicles, 214 motorcycles
Fai Ieng Building Car Park	121 light vehicles, 107 motorcycles
Hong Kong-Zhuhai-Macao Bridge Checkpoint Building (West) Car Park	3,089 light vehicles, 2,054 motorcycles
Hong Kong-Zhuhai-Macao Bridge Checkpoint Building (East) Car Park (beyond Macao border)	3,000 light vehicles
Patane Municipal Market Complex Car Park	116 light vehicles, 194 motorcycles
New Wholesale Market Car Park	230 light vehicles, 198 motorcycles
Cheng Tou Building Car Park	80 light vehicles, 83 motorcycles
Border Gate Sports Complex Car Park	788 light vehicles, 800 motorcycles
Bairro da Ilha Verde Building Car Park	1,427 light vehicles, 1,628 motorcycles
Joao Lecaros Car Park	46 light vehicles, 56 motorcycles
Qingmao Border Control Car Park	158 light vehicles, 207 motorcycles
Mong Tak Building Car Park	476 light vehicles, 280 motorcycles
Edificio Toi Fai Car Park	105 light vehicles, 119 motorcycles
Mong-Há Sports Centre Car Park	264 light vehicles, 212 motorcycles
A-Ma Transport Interchange Car Park	201 light vehicles, 403 motorcycles

As at 31 December 2022, there were 7,702 parking meters for light vehicles, of which 214 were one-hour parking meters, 5,695 were two-hour parking meters and 1,793 were four-hour parking meters. There were 858 non-metered parking spaces. There were 3,031 parking meters for motorcycles, of which 1,730 were two-hour parking meters and 1,301 were four-hour parking meters. There were 29,376 non-metered parking spaces for motorcycles.

Road Safety

According to statistics provided by the Public Security Police, 11,169 traffic accidents occurred in Macao during 2022, resulting in 3,984 injuries and seven fatalities.

The Public Security Police Force and the Transport Bureau continued promoting the importance of compliance with traffic regulations, thus strengthening the understanding of laws and sense of road safety among local residents. Workshops and talks about road safety were also held in schools, community centres, non-governmental organisations and private organisations, to strengthen the understanding of road safety among local residents through long-term education. During 2022, the road safety seminars and workshops co-organised by the Transport Bureau and Traffic Department attracted 4,458 participants from 24 schools and organisations.

Cross-border Traffic

Cross-border Land Routes

Five land routes link Macao and mainland China: the Border Gate, the Zhuhai-Macao Cross-border Industrial Zone, Qingmao, the Hong Kong-Zhuhai-Macao Bridge checkpoint, and the Macao border crossing area of Hengqin.

In 2022, the numbers of arrivals of Macao residents via the Border Gate, Hong Kong-Zhuhai-Macao Bridge, Macao border crossing area of Hengqin checkpoint, Zhuhai-Macao Cross-border Industrial Zone and Qingmao checkpoint were 15,763,037, 1,017,547, 1,232,141, 95,205 and 2,880,505, respectively.

During 2022, there were 5,325,019 visitor arrivals by land, representing a decrease of 24.3 percent from the previous year's figure.

Of these, 3,913,011 entered via the Border Gate; tourists from mainland China and Hong Kong represented 89.1 percent and 9.9 percent of the total, respectively.

There were 148,148 visitors who arrived via Hong Kong-Zhuhai-Macao Bridge checkpoint; tourists from mainland China and Hong Kong accounted for 70.8 percent and 28.2 percent of this total, respectively.

The number of visitors who arrived via the Macao checkpoint of Hengqin Port was 889,103, while 5,651 arrived via the Zhuhai-Macao Cross-border Industrial Zone. There were 369,106 visitors who arrived via the Qingmao border checkpoint; tourists from mainland China and Hong Kong accounted for 89.9 percent and 10.1 percent of this total, respectively.

Cross-Border Marine Transportation Services

The Outer Harbour Ferry Terminal, Taipa Ferry Terminal and Inner Harbour Ferry Terminal provide cross-border transportation services for passengers travelling between Macao and Hong Kong and mainland China. Scheduled passenger ferries to Hong Kong and mainland China are operated by the Shun Tak China Travel — Companhia de Gestão de Embarcações (Macao), Limitada; Far East Hydrofoil Company; Hong Kong-Macao Hydrofoil Company; Yuet Tung Shipping Company; and Cotai Waterjets (Macao) Limited.

Outer Harbour Ferry Terminal

The Outer Harbour Ferry Terminal commenced operations in 1993. The terminal has a total floor area of 65,000 square metres, and provides 14 berths and a helicopter pad on its rooftop. The main building is a three-storey building, with the first floor as arrival floor, the second as departure floor and the third as food and beverage, shopping and passenger waiting area. The terminal provides maritime passenger transportation services between Macao and various places including Sheung Wan, Tsim Sha Tsui and Hong Kong International Airport in Hong Kong, Fuyong and Shekou in Shenzhen, and Jiuzhou Port in Zhuhai. Moreover, it also provides helicopter transportation services between Macao and Hong Kong, and between Macao and Shenzhen.

Due to the pandemic, the Outbound Harbour Ferry Terminal continued suspensions of ferry services between Macao and Hong Kong, Fuyong in Shenzhen and Jiuzhou Port in Zhuhai during 2022. The service between Macao and Shekou in Shenzhen was suspended several times due to the pandemic; it resumed on 14 September, with three scheduled ferry sailings daily, and the shipping company would increase the number of sailings according to circumstances.

Taipa Ferry Terminal

The Taipa Ferry Terminal commenced operation in June 2017, with a total floor area of 200,000 square metres, 16 berths, three multi-functional berths for ferries and a helicopter pad on its rooftop. The ground floor and first floor serve as the arrival floor and departure floor, respectively, with a food square in the west of the ground floor. The Terminal provides maritime passenger transportation services between Macao and various places including Sheung Wan, Tsim Sha Tsui, Tuen Mun and Hong Kong International Airport in Hong Kong, Fuyong and Shekou in Shenzhen, Humen in Dongguan, and Jiuzhou Port in Zhuhai to provide leisure cruise services.

Due to the pandemic, the Taipa Ferry Terminal suspended the ferry services between Macao and Hong Kong, Fuyong in Shenzhen, Humen in Dongguan and Jiuzhou Port in Zhuhai during 2022; the service between Macao and Hong Kong International Airport resumed on 30 December 2022; and the service between Macao and Shekou in Shenzhen was suspended several times due to the pandemic; it resumed on 14 September, with six scheduled ferry sailings daily, and the shipping company would increase the number of sailings according to circumstances.

Inner Harbour Ferry Terminal

The Inner Harbour Ferry Terminal, which commenced operation in 2008, has a total floor area of

1,200 square metres and two berths. The ground floor is the arrival hall and the first floor is the departure hall. The terminal provides maritime passenger transportation services between Inner Harbour Ferry Terminal and Wanzai in Zhuhai.

Due to the pandemic, the ferry service between the Inner Harbour Ferry Terminal and Wanzai in Zhuhai was suspended several times during 2022; it resumed on 5 August, maintaining a sailing every 30 minutes.

Maritime Passenger and Cargo Transportation

During 2022, the numbers of arrivals of Macao residents via the Outer Harbour Ferry Terminal, Inner Harbour Ferry Terminal and Taipa Ferry Terminal were 1,002, 134,471 and 7,174, respectively. Regarding visitor arrivals, 167,146 passengers arrived in Macao by sea, representing a decrease of 16.8 percent compared with the 2021 figure. Of these, 27,963 entered Macao via the Outer Harbour Ferry Terminal, 45,560 via the Inner Harbour Ferry Terminal, and 93,623 via the Taipa Ferry Terminal.

In 2022, 86,021 containers, holding 127,786 TEUs (twenty-foot equivalent units) were shipped into and out of Macao by sea, representing increases of 1.1 percent and 2.99 percent, respectively, over the 2021 figures.

Yuet Tung Shipping Company Limited and Macau Cruise Development Company Limited commenced operating regular sightseeing maritime routes at the Inner Harbour Ferry Terminal in September 2018 and October 2019, respectively.

Shun Tak China Travel Ship Management (Macao) Limited commenced operating Macao Aquatic Trek charter services at Taipa Ferry Terminal and Coloane Pier in December 2018, and on 1 July 2021 began utilising Barra Pier for passenger embarkation and disembarkation.

In 2022, there were 1,016 Macao Aquatic Trek charter services, with a total of 15,362 passengers. Due to the pandemic, there were several suspensions of Macao Aquatic Trek charter services, as Shun Tak China Travel – Companhia de Gestão de Embarcações (Macao) was requested to suspend its services from 12 August, while from 1 October the other two shipping companies rescheduled their services to weekends and holidays.

2022 Sightseeing Maritime Routes		
	No. of Sails	No. of Passengers
January 2022	118	914
February 2022	188	4,525
March 2022	134	711
April 2022	203	3,212

(Cont.)

2022 Sightseeing Maritime Routes		
	No. of Sails	No. of Passengers
May 2022	204	2,611
June 2022	109	1,099
July 2022	0	0
August 2022	0	0
September 2022	2	24
October 2022	47	1,706
November 2022	4	144
December 2022	7	416

Cross-Border Helicopter Services

Helicopters are the most convenient way to travel between Macao and Hong Kong and between Macao and Shenzhen. A Hong Kong-Macao helicopter passenger transportation service was inaugurated in 1990. The Shenzhen-Macao helicopter passenger transportation service was launched in 2002 and operated by East Asia Airlines. In accordance with the Government's anti-pandemic policies, the helicopter services between Macao and Hong Kong and between Macao and Shenzhen have been suspended since 5 February 2020.

Ports

Outer Harbour

The Outer Harbour is located on the east coast of the Macao peninsula, which is primarily the Outer Harbour Ferry Terminal and designated for scheduled high-speed ferries between Macao and Hong Kong and Pearl River Delta. Its watercourse is 120 metres wide and 4.4 metres deep.

Inner Harbour

Located on the west coast of the Macao peninsula, the Inner Harbour has many piers for loading and discharging cargo, plus Pier 11A, the ferry terminal, used by passenger ferries licensed by the Marine and Water Bureau. The South Sampan Pier between Piers 8 and 9 is used by crewmembers of ships berthed in the Inner Harbour to land and depart. In line with the MSAR Government's anti-pandemic effort, use of the South Sampan Pier has been suspended from 1 March 2021.

The Macao Channel is 60 metres wide, and its fairway is 55 metres wide and 3.5 metres deep.

Taipa

The Taipa Ferry Terminal is situated on the north-eastern tip of Taipa island, and is exclusively for scheduled high-speed ferries shuttling between Macao and Hong Kong, and between Macao and the Pearl River Delta area. Its fairway is 120 metres wide and 4.4 metres deep.

Ka Ho Harbour

Located on the northeast shore of Coloane island, Ka Ho Harbour consists of the Fuel Oil Terminal, Cement Terminal, Ka Ho Container Port, and Power Plant Terminal. Its approach channel is 75 metres wide and 4.4 metres deep.

Ka Ho Container Wharf and Fuel Oil Terminal

Phase One of Ka Ho Container Wharf commenced operations in December 1991. With a total construction area of 49,524 square metres, it includes a container wharf, container yard and warehouses. At present, it has two berths, of 135 metres and 171.4 metres in length; a 10,428-square-metre cargo working area; a 23,828-square-metre container yard; and 2,850 square metres of cargo warehousing space. The terminal's annual handling capacity is 100,000 TEUs.

In 2022, Ka Ho Harbour handled 12,060 inbound TEUs (twenty-foot equivalent units) and 10,725 outbound TEUs; both figures include re-exports.

The Fuel Oil Terminal commenced operation in June 1995. It can store a wide variety of fuel oil imported into Macao, and can simultaneously load and unload two fuel-carrying vessels. It has 14 storage tanks with a combined capacity of 86,000 cubic metres.

Marine and Water Bureau

The Marine and Water Bureau was created through a restructuring of the former Maritime Administration, and is under the Secretariat for Transport and Public Works of the MSAR Government. It is a public department with administrative autonomy, and is responsible for exercising maritime authority, promoting the development of maritime activities, and coordinating water resources management and water supply.

To promote and assist economic development of the fishery sector, in 2007 the Government promulgated By-law No. 3/2007 to establish the Fisheries Development and Support Fund. The Fisheries Development and Support Fund started to receive applications on 30 April 2007. The loans approved by the end of 2022 totalled around 85.47 million patacas.

To accord with the anti-pandemic work, the Marine and Water Bureau implemented a series of related measures and work. Regarding the maritime passenger transportation, the Marine and Water Bureau designated part of the Taipa Ferry Terminal as a Government medical surveillance

site and COVID-19 regular nucleic acid testing collection station.

Ships

Maritime Registration

By law, all vessels engaged in economic activities – including freighters, passenger vessels, fishing boats and auxiliary boats – must be registered with the Marine and Water Bureau and the Commercial and Movable Goods Registry. The registration procedures are designed to verify conformity with official requirements concerning technology, safety and environmental protection. Maritime registration is a prerequisite for vessels seeking commercial registration. There were 258 registered vessels at the end of 2022.

In addition, maritime and commercial registration is required for vessels over 2.5 metres in length that are used for non-profit-making purposes, such as water sports, fishing or recreational activities. These include ocean-going, coastal, inshore, channel and river pleasure boats. There were 71 registered vessels in this category at the end of 2022, including nine that were newly registered.

Seafarer Registration

According to the law, Macao residents aged 18 or above may apply for seafarer registration with the Marine and Water Bureau. All Macao residents who wish to conduct professional maritime activities on commercial vessels, auxiliary boats or fishing boats are required to register with the Marine and Water Bureau beforehand. At the end of 2022, a total of 50 people held seafarer's books issued by the Marine and Water Bureau.

Maritime Training School

The Maritime Training School is Macao's only nautical education institution. Its principal objectives are to provide theoretical and practical training in maritime subjects and harbour management, as well as related scientific knowledge.

Most of the training school's students are staff members from the Marine and Water Bureau, Macao Customs Service, Fire Service and Public Security Police Force, as well as sailors, fishermen and nautical athletes in Macao. The training school also provides after-school activities for youngsters and students.

During 2022, the school held a total of 24 training courses, with a total of 520 trainees.

Government Dockyard

The Government Dockyard is a department under the Marine and Water Bureau. As well as shipbuilding and ship repairs, it is responsible for maintaining and repairing government vehicles, verifying their status and inspecting them, handling newly purchased vehicles, as well as making and installing vehicle identification plates. At present, most of the vessels built and repaired at

the Government Dockyard belong to the Marine and Water Bureau and Macao Customs Service.

In 2022, the Government Dockyard built two new vessels – one 38-metre beacon vessel for the Marine and Water Bureau, and one 11-metre fibreglass vessel. It also carried out 204 vessel maintenance projects, 154 of which were completed. The shipyard carried out 2,003 projects concerning examination, maintenance and repair of 1,786 vessels.

Civil Aviation

Civil Aviation Authority

The Civil Aviation Authority was founded on 4 February 1991, in accordance with Decree-Law No. 10/91/M dated 4 February 1991. It is constituted as a public institution under the Secretariat for Transport and Public Works, and it enjoys autonomy over administration, finances and property. It is responsible for directing, controlling and monitoring all civil aviation activities in Macao, and the operations of all aircraft registered in Macao.

Aviation Service

To implement its “Open Skies” policy, the Government has adopted a series of measures to enhance Macao’s civil aviation infrastructure network. Every effort has been made to attract additional investment from domestic and foreign airlines, to promote the use of Macau International Airport, and to enhance the development of passenger and cargo transportation.

To increase cooperation with the international aviation community, the Government will continue to forge new air services agreements with countries around the world. By 31 December 2022, Macao had initialled air services agreements with 50 nations and regions, 41 of which had been officially signed.

Signatories of Air Services Agreements with Macao	
Nation	Signing date
Brazil	15/07/1994
Finland	09/09/1994
Austria	04/11/1994
Belgium	16/11/1994
The Netherlands	16/11/1994
Luxembourg	14/12/1994
New Zealand	09/03/1995

(Cont.)

Signatories of Air Services Agreements with Macao	
Nation	Signing date
Portugal	31/08/1995
Switzerland	05/09/1995
Singapore	27/10/1995
Malaysia	31/10/1995
Thailand	01/11/1995
United States	03/07/1996
Vietnam	07/08/1996
Germany	05/09/1996
DPR Korea	08/12/1996
Denmark	11/12/1996
Sweden	11/12/1996
Norway	11/12/1996
South Korea	03/04/1997
The Philippines	18/07/1997
India	11/02/1998
Nepal	19/02/1998
South Africa	04/04/1998
Brunei	24/05/1998
United Arab Emirates	06/12/1998
Russia	21/01/1999
Myanmar	12/03/1999
Australia	24/08/1999
Poland	22/10/1999

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Signatories of Air Services Agreements with Macao	
Nation	Signing date
Pakistan	15/11/2000
Czech Republic	25/09/2001
Cambodia	12/12/2001
United Kingdom	19/01/2004
Iceland	13/07/2004
Maldives	16/01/2006
France	23/05/2006
Sri Lanka	08/06/2006
Mongolia	27/06/2006
Japan	10/02/2010
Laos	25/06/2013
Oman	Initialled
Indonesia	Initialled
Israel	Initialled
Greece	Initialled
Slovakia	Initialled
Cape Verde	Initialled
Chile	Initialled
Turkey	Initialled
Qatar	Initialled

Other agreements:

The MSAR Government has signed the following agreement on aviation with the Portuguese Government:

Agreement	Signing date
Protocol on Cooperation in Civil Aviation Between the Portuguese Republic and the Macao Special Administrative Region of the People's Republic of China	9 September 2002

The MSAR Government has signed the following multilateral agreements with the European Union:

Agreement	Signing date
Agreement between the Government of the Macao Special Administrative Region of the People's Republic of China and the European Union on Certain Aspects of Air Services	23 November 2013

As at 31 December 2022, two airlines were registered in Macao and providing flight services: Air Macao Company and Sky Shuttle.

The fleets and scheduled flight services of the two companies were as follows:

Airline	Fleet	Destinations
Air Macao Co, Ltd	6 x Airbus A320 4 x Airbus A320neo 8 x Airbus A321 4 x Airbus A321neo	Shanghai (Pudong, Hongqiao), Beijing (capital, Daxing), Hangzhou, Xiamen, Nanjing, Ningbo, Chengdu, Nanning, Chongqing, Taiyuan, Tianjin, Zhengzhou, Changzhou, Qingdao, Fuzhou, Wenzhou, Yiwu, Nantong, Taipei, Tokyo, and Hanoi.
Sky Shuttle (Helicopter service)	2 x Agusta AW139	No service

The numbers of pilots licensed by the Civil Aviation Authority, as at 31 December 2022, were:

Airline	Number of licensed pilots
Civil Aviation Authority	0
Air Macau Company Limited	160
Sky Shuttle	4
Total	164

Macau International Airport is located at the eastern end of Taipa island and neighbouring waters. The terminal building was constructed on a rock-cut platform at Ponta da Cabrita, while the apron was built on reclaimed land. East of the apron, the air-traffic control building, control tower and ancillary fire station are on Kia Kiong Islet. The runway is on an artificial island linked to the apron by two taxiway bridges.

The main fire station is on the runway island, next to the oblique taxiway. The airport is within easy reach of the Macao peninsula, the Outer Harbour and Zhuhai via motorway, the Friendship Bridge and the Lotus Flower Bridge. Commuting time from each of these points is less than 20 minutes.

Macau International Airport handled 599,185 passengers during 2022, 47.8 percent less than in 2021. Its cargo volume was 51,401 tonnes, representing an increase of 5.8 percent. A total of 13,642 flights took off or landed, representing a decrease of 13.6 percent.

The number of private and commercial air charters decreased from 141 in 2021 to 90 in 2022, representing a decrease of 36 percent.

Air Traffic Control

Since it opened in 1995, the airport's air traffic control system has followed the International Civil Aviation Organization standards, to ensure service efficiency and flight safety. Air traffic control facilities include secondary surveillance radar, ground radar and the Automatic Terminal System. Telecommunications facilities include AMHS, while air-ground communications facilities include a UHF radio station, and navigation facilities include a Doppler VHF omnidirectional radio range (DVOR) apparatus and Instrument Landing System.

The zone with Macao's air traffic control service is classified as Category-C under International Civil Aviation Organization (ICAO) standards. The keyhole-shaped air traffic zone is centred on Macau International Airport. It extends up to an altitude of 3,000 feet and a radius of five nautical miles. The western boundary is a straight line parallel to and three nautical miles from the runway. To the south, the zone forms a rectangle five nautical miles wide and extending southwards for 10 nautical miles.

Macao's air traffic zone lies between the Hong Kong and Guangzhou flight information zones. All aircraft, including helicopters entering Macao airspace, are supervised by the airport control tower. Arriving and departing aircraft can land or take off from both the southern and northern approaches. The mainland China authorities control air traffic to the north of Macao's air zone, while traffic to the south is controlled by the Civil Aviation Department of Hong Kong. Since traffic in the Pearl River Delta airspace is busy and complex, the air-traffic control authorities of Macao, mainland China and Hong Kong must work closely to ensure the safety and efficiency of air traffic control in Macao and the neighbouring air zones.

Aircraft Noise

Macau International Airport was constructed offshore and far from residential communities, avoiding the need to install soundproofing. However, to protect Zhuhai from noise pollution caused

by northbound flights taking off from the runway, aircraft are not allowed to pass the 231-degree radial line of Zhuhai's Jiuzhou omni-directional beacon station.

Aviation Security

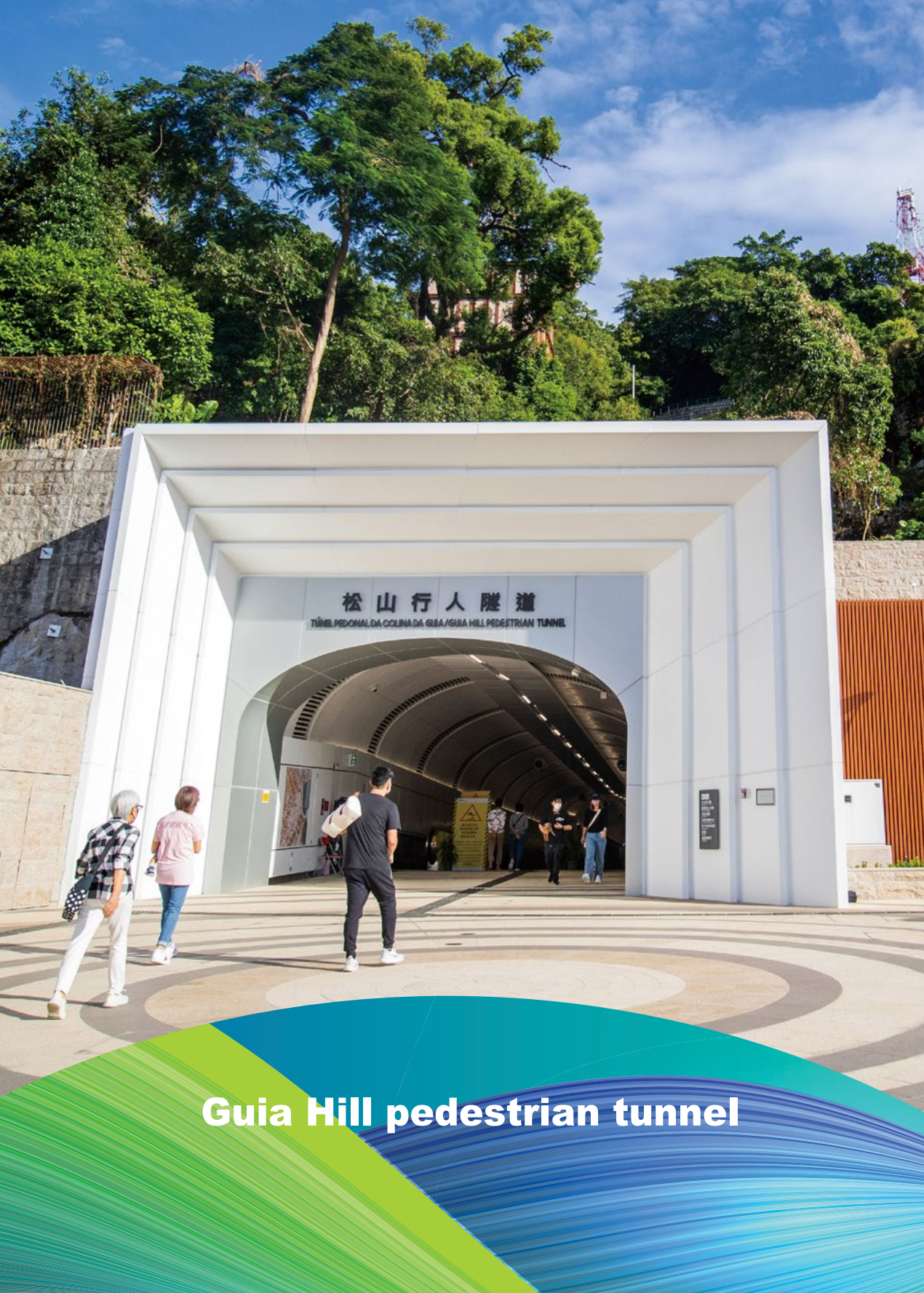
Under By-law No. 16/2022 issued on 19 April, the security plan of MSAR civil aviation is intended to ensure the safety, normal operations and efficiency of international civil aviation activities in Macao. The security plan is essential to protect passengers, crew, airport staff and the public, as well as ensuring the normal, uninterrupted operations of aircraft, facilities and equipment.

The MSAR civil aviation security plan involves the Civil Aviation Authority, the Public Security Force and public security departments, airport operator, air freight operators and air transportation service providers.

The airport operator is responsible for formulating and implementing the airport security plan, to ensure that the security measures and procedures comply with the security requirements of aviation in Macao and the International Civil Aviation Organization (ICAO) standards and recommendations.

Macau International Airport Company

Macau International Airport Company (CAM) has been appointed by the Government to operate Macau International Airport. It was responsible for the airport's construction, and it is now responsible for its operation. The Government approved the company's application in 2001 to extend its franchise by a further 25 years, to 2039.



Guia Hill pedestrian tunnel





The Guia Hill pedestrian tunnel, a major component of the Pedestrian System Surrounding Guia Hill, opened on 1 October. The tunnel passes through the NAPE district to Avenida de Horta e Costa, shortening the walking distance from 1,100 metres, around Guia Hill, to about 400 metres. It also connects with nearby escalators to provide an even faster, more convenient walking route for citizens and tourists. The walking system is designed to integrate with nature, with Macao's world heritage as the theme for decorations, creating a comfortable leisure space that has been widely acclaimed by the public.