

Hong Kong's roads are among the most heavily used in the world, with over 732 000 vehicles on 2 101 kilometres (km) of roads — 442 km on Hong Kong Island, 466 km in Kowloon and 1 193 km in the New Territories. Together with the dense development and difficult terrain, it imposes a constant challenge to the highway engineers.

There are 15 major road tunnels, 1 340 flyovers and bridges as well as 1 222 footbridges and subways to keep people and goods on the move.

Hong Kong Island: On Hong Kong Island, the earliest route out of Victoria went around the west end of the Island to Aberdeen. Two roads were built subsequently, one over the centre of the Island and one around its eastern end. Since the opening of the Cross Harbour Tunnel in August 1972, the Kowloon Peninsula has been linked with Hong Kong Island.

With the rapid development on the Island, the westerly route along Pok Fu Lam Road has been widened in stages to four lanes. To cater for the growing development on the southern Ap Lei Chau Island, two bridges were completed in March 1980 and July 1994 to provide direct access to this island.

A north-south route, the section of Route 1 through the centre of the Island, comprising the Aberdeen Tunnel and grade-separated road networks at its approaches, was completed in March 1982, linking Aberdeen with Happy Valley and the Cross Harbour Tunnel.

The construction of the Eastern Harbour Crossing was completed in September 1989. It connects Cha Kwo Ling on Kowloon Peninsula with Quarry Bay on Hong Kong Island.

On the north shore, a dual three-lane road runs from Central to Causeway Bay and connects to the Island Eastern Corridor, which is a dual three-lane expressway, extends 9 km eastward to Chai Wan. Construction commenced in early 1981 and was completed in October 1989. The corridor is mainly built either on elevated structures along the shoreline or as a ground level road on reclaimed land. Improvement works to the corridor from North Point Interchange to Sai Wan Ho was completed in 2003.

Another highway scheme, the section of Route 4 on the north shore of the Island, was completed in January 1990. It provides a free-flow facility in an east-west direction along Connaught Road through Central via the Rumsey Street Flyover, Pedder Street Underpass and the Harcourt Road Flyover. Extension of Route 4 to Kennedy Town was completed in February 1997.

A pedestrian link with escalators and travelators between the central business district and the residential areas in Mid-Levels was completed and opened to the public in January 1994. The covered walkway system provides a direct access for pedestrians so as to minimise the use of private cars and public transport.

A two-way link between Smithfield and Pok Fu Lam Road was completed in January 1998. It improves traffic flow and copes with the increase in traffic from the Western Harbour Crossing.

Kowloon: The first major road network constructed in Kowloon was centred on Tsim Sha Tsui and fanned outwards towards Lai Chi Kok, Kowloon Tong, Kai Tak and onwards to Kwun Tong.

With the rapid development of air travel and manufacturing industry in the early 1960s, the corridor between Kwun Tong and Mong Kok was enhanced. In the early 1970s, the Prince Edward Road Interchange in Kowloon City adjacent to the old airport at Kai Tak was completed. Traffic flow in this corridor was further improved with the completion of the Princess Margaret Road Flyover, which was the first precast pre-stressed concrete flyover constructed in Hong Kong. The increased capacity of the junction of Argyle Street and Princess Margaret Road provided better access to the then developing residential areas in Kowloon Tong.

With the rapid growth of industry in the 1970s, a new road along the foot of the Kowloon Hills in North Kowloon was constructed to provide a more direct link to the developing Container Port at Kwai Chung in West Kowloon. This road, which is known as the Lung Cheung Road and Ching Cheung Road, is now part of Route 7, a trunk road linking Tseung Kwan O in the south eastern New Territories to Kwai Chung. This road has been expanded twice from an original two-lane road to the present dual three-lane configuration with grade separation at each of its eight interchanges.

After the opening of the Cross Harbour Tunnel and its Hong Chong Interchange in 1972, and as tunnel use grew, it became essential to improve the roads connecting to it. The completion of the elevated East Kowloon Way in 1981 and the Kai Tak Tunnel in 1982 provided better access to Kwun Tong, and the completion in stages of the West Kowloon Corridor between 1987 and end 1996 shortened journey time between Yau Ma Tei and Lai Chi Kok. The flyover at the junction of Argyle Street and Princess Margaret Road was reconstructed in the 1980s to further increase the north/south capacity of the junction in part to cope with the substantial increase in traffic originating from the New Territories. The flyover is a key element of Route 1 in Kowloon which extends from the Cross Harbour Tunnel to the Lion Rock Tunnel and beyond to the New Territories.

The Kwun Tong Bypass was completed in 1991. It connects the Tate's Cairn Tunnel and Tseung Kwan O Tunnel, and also the Eastern Harbour Crossing at Cha Kwo Ling, which opened in 1989.

The Hung Hom Bypass was completed in 1999. It links Salisbury Road in Tsim Sha Tsui East with Hung Hom Road in Hung Hom.

A pedestrian subway system with travelators was completed and operated in October 2004 to link between Tsim Sha Tsui Station at Nathan Road and East Tsim Sha Tsui Station at Salisbury Road. This subway system was also extended to link with nearby hotels and commercial buildings to provide direct access for pedestrians so as to minimize their need to cross busy roads at ground level.

Tsing Sha Highway is a 13-km dual three-lane highway connecting Shatin, West Kowloon and Tsing Yi relieving the heavy traffic loading in Lion Rock Tunnel and Tate's Cairn Tunnel. Regarding the Kowloon sections of the Tsing Sha Highway, the Lai Chi Kok Viaduct (as part of the section of Route 8 between Cheung Sha Wan and Shatin) has been opened to traffic since March 2008, while the Ngong Shuen Chau Viaduct (as part of the section of Route 8 between Cheung Sha Wan and Tsing Yi) has been opened since December 2009.

New Territories: In the New Territories, the construction of new roads, apart from those serving Tsuen Wan, continued at a slow pace until the early 1970s when the new towns were built.

In 1967, the opportunity to link Sha Tin directly with Kowloon came with the need to build a water supply tunnel through the range of hills separating Kowloon and the New Territories. The Lion Rock Tunnel was designed to accommodate a two-lane road as well as three large water pipes. A second two-lane tunnel was subsequently built adjacent to the first and opened to traffic in 1978.

The Tsing Yi Bridge, which connects Tsing Yi Island with Kwai Chung and Tsuen Wan, was completed in 1974. The second Tsing Yi Bridge was constructed and opened to traffic in late 1987. The third Tsing Yi Bridge was constructed and opened to traffic in late 1997.

Tuen Mun Road was partially completed and opened to traffic in May 1978 to link up Tsuen Wan and Tuen Mun. It was fully completed in May 1983. The project provided a challenge to highway engineering since the route involved the construction of many bridges and culverts along terrain. To tackle the aging problem of Tuen Mun Road and to upgrade the road to the current design standard as far as practicable, improvement and reconstruction of a section of Tuen Mun Road from Tsuen Wan to Sham Shing Hui in Tuen Mun commenced in 2008 and was completed in end 2014. Improvement to the Town Centre Section of Tuen Mun Road commenced in end 2009 and was completed in February 2014.

A 7 km long dual two-lane carriageway, which is part of Route 9, links Sha Tin directly with Tsuen Wan via the Shing Mun Tunnel. The project was completed and opened to the public in 1990.

To cope with traffic generated as a result of the growth of new towns in Tai Po, Fanling and Yuen Long, together with the increasing cross-boundary traffic with Shenzhen, the construction of a high capacity trunk road, the New Territories Circular Road, commenced in 1980 to connect these new towns. The whole road was completed in January 1993.

Yuen Long Highway, completed in July 1993, provides a continuation of Route 9 from Tuen Mun to Yuen

Long. To cope with increasing traffic, the highway was widened from a dual two-lane carriageway to a dual three-lane carriageway. The road widening works between Shap Pat Heung Interchange and Tan Kwai Tsuen and between Tan Kwai Tsuen and Lam Tei were completed in March 2006 and July 2007 respectively.

To improve cross border traffic and relieve the road access to northwest New Territories, the Tai Lam Tunnel and its approaches of Route 3 commenced construction in 1995 and was completed in May 1998.

The Ting Kau Bridge forms the vital link between the Tai Lam Tunnel and Tsing Yi section of Route 3 and connects the western New Territories via Tuen Mun Road to the Lantau Link. The bridge and approach viaduct were opened to traffic in May 1998.

To cope with increasing traffic, the section of Castle Peak Road between Siu Lam and So Kwun Wat was widened to a dual two-lane carriageway in December 2000. Widening of the section between Tsuen Wan and Siu Lam was later completed in June 2007.

Tsing Yi North Coastal Road was completed in 2002. It provides a direct link of the Northwest Tsing Yi Interchange via Tsing Tsuen Road with Kwai Chung.

To cope with anticipated increase in traffic, Tolo Highway was widened to dual four-lane carriageway in stages. The section between Ma Liu Shui and Yuen Chau Tsai was completed in 2003. Regarding the section between Yuen Chau Tsai and Tai Hang, the widening was completed in March 2014.

The construction of the new boundary bridge between Lok Ma Chau and Huanggang commenced in November 2003 and was completed in December 2004. The project provided additional dual two-lane to the existing cross boundary link to cope with the growing traffic.

The improved Tung Chung Road was opened to public use in February 2009. The original single-lane road has been improved to a single two-lane road in order to meet the traffic demand and to improve road safety.

Kong Sham Western Highway is a dual three-lane carriageway with a total length of about 5.4 km, extending from Ngau Hom Shek in the north near the shoreline to Lam Tei in the south. The majority of the Kong Sham Western Highway is in the form of viaducts. The road was opened to public use in July 2007.

The Shenzhen Bay Bridge is an additional cross boundary link from Shenzhen to join up with Kong Sham Western Highway on the Hong Kong side. It is a 5.5 km dual three-lane carriageway (Hong Kong section is 3.5 km whereas the Shenzhen section is 2 km). This crossing alleviates the pressure on the existing crossings, enhances the trade between Hong Kong and Southern China, and facilitates further economic development in areas such as finance, logistics and tourism. The Shenzhen Bay Bridge was opened to traffic in July 2007.

Route 8 is a trunk road linking Lantau Island and Sha Tin. The North Lantau Highway and Lantau Link completed in 1997 form part of this route. The section between Cheung Sha Wan and Sha Tin (including Eagle's Nest Tunnel and Sha Tin Heights Tunnels) was commissioned in March 2008. The remaining section

between Tsing Yi and Cheung Sha Wan (including Nam Wan Tunnel and Stonecutters Bridge, which is one of the world's longest span cable stayed bridges) was also fully opened to traffic in 2009.

Airport Access: The relocation of the airport to Chek Lap Kok requires additional road links to serve the new airport and its supporting community. A new expressway serving the airport and Tung Chung new town, comprising the North Lantau Highway, Lantau Link, Cheung Tsing Highway, Cheung Tsing Tunnel, Tsing Kwai Highway, West Kowloon Highway and Western Harbour Crossing, were completed and opened to traffic in 1997.

The whole new airport access measures a total of some 34 km. Leaving the airport, drivers will come onto the 12.5 km North Lantau Highway which was built along the northern coastline of Lantau Island. At the northern tip of Lantau Island, it joins the 4.2 km long Lantau Link. The Lantau Link comprises the cable-stayed Kap Shui Mun Bridge, the Ma Wan Viaduct and, of course the spectacular Tsing Ma Bridge. The main span of Tsing Ma Bridge measures 1 377m, making it the longest suspension bridge in the world carrying both road and rail traffic.

At the northwestern part of Tsing Yi Island, the Lantau Link is connected with the Cheung Tsing Highway which in turn links with the Tsing Kwai Highway. At Lai Chi Kok, the airport access continues along the 4.2 km long West Kowloon Highway that runs along the western coastline of the Kowloon Peninsula. Both Tsing Kwai Highway and West Kowloon Highway are essentially on viaducts, until the route finally enters Hong Kong's first dual three-lane immersed tube tunnel, the Western Harbour Crossing, which measures 2 km from the portal on the West Kowloon Reclamation near Yau Ma Tei to the exit and the end of the new airport access, at Sai Ying Pun on Hong Kong Island.

Building For Future: To cope with traffic growth, the section of Fanling Highway between Tai Hang and Wo Hop Shek Interchange is being widened from dual three-lane carriageway to dual four-lane carriageway with standard hard shoulders. Works commenced in July 2013.

The construction of the Central-Wan Chai Bypass and Island Eastern Corridor Link (CWB) commenced in end 2009. The CWB is a dual three-lane trunk road of about 4.5 km running along the northern shore of Hong Kong Island. It will be an expressway for east-west traffic between Central and North Point relieving the congestion along the existing Connaught Road Central, Harcourt Road and Gloucester Road and coping with the predicted traffic flow in the area. Upon commissioning of the CWB, it will take only about 5 minutes to travel between Central and Island Eastern Corridor in North Point. Linkage between the east of Hong Kong Island and other districts in the western side of the territory will be more direct and the travelling time will be greatly reduced.

The proposed Hong Kong-Zhuhai-Macao Bridge (HZMB), lying across the Lingdingyang of the Pearl River Estuary, is a 42 km long sea crossing that connects the Hong Kong SAR, Zhuhai City of Guangdong Province and Macao SAR. The HZMB-related Hong Kong projects include

the Hong Kong Link Road (HKLR), the Hong Kong Boundary Crossing Facilities (HKBCF) and the Tuen Mun-Chek Lap Kok Link (TM-CLKL). The HZMB and its related Hong Kong projects will form a strategic road network connecting Hong Kong, Macao and Zhuhai.

The HZMB Main Bridge, which is situated within the Mainland waters, is a 30 km long dual three-lane carriageway in the form of bridge-cum-tunnel structure comprising a 7 km long immersed tube tunnel. It runs from the artificial island of Zhuhai and Macao Boundary Crossing Facilities to the eastern artificial island for the tunnel section just west of the Hong Kong SAR boundary. On the project finance, the Main Bridge is jointly funded by the governments of the three places while the construction of the boundary crossing facilities and local link roads at each place will be funded by the respective governments. Because of the substantial cost of the Main Bridge, part of its cost has to be financed by bank loans. The construction of the Main Bridge and the Hong Kong related projects commenced in end 2009 and end 2011 respectively.

The proposed HKLR, connecting the HZMB Main Bridge and the HKBCF, is a 12 km long dual three-lane carriageway comprising sea viaducts, a tunnel and at-grade road sections along the east coast of the Airport Island. The section between HKSAR Boundary and Scenic Hill and the section between Scenic Hill and the HKBCF of the HKLR are implemented under two Design and Build Contracts, which commenced in end May 2012.

The proposed HKBCF will be situated on a 150 ha artificial island (about 130 ha for the HKBCF and about 20 ha for the TM-CLKL Southern Landfall) at the waters off the northeast of the Hong Kong International Airport (HKIA). It connects Zhuhai and Macao via the HKLR and HZMB Main Bridge, as well as the Northwest New Territories (NWNT) and North Lantau via the TM-CLKL. Coupled with the HKIA and the railway and ferry services in its vicinity, it will become an important transportation hub upon completion. About 20 buildings will be built on the island including a passenger clearance building, cargo clearance facilities, etc. to provide passenger and cargo clearance services. The reclamation works for the artificial island commenced in end 2011. While the HKBCF infrastructure works for connecting the HKIA and HKBCF was entrusted to the HKLR contract for the HKLR section between Scenic Hill and the HKBCF, which commenced in May 2012, the HKBCF superstructure works on the artificial island commenced in 2014.

The proposed TM-CLKL is a 9 km long dual two-lane highway linking the HKBCF with the NWNT and North Lantau. Upon completion, the new route will significantly reduce the journey time between the NWNT and Lantau, and will relieve the traffic of the existing road network, including Tuen Mun Road, Ting Kau Bridge, Tsing Ma Bridge, etc. It will serve as an alternative and emergency route of the North Lantau Highway to the HKIA. The advance works of the TM-CLKL commenced in end 2011. The construction works for TM-CLKL commenced in June 2013.

The proposed Central Kowloon Route (CKR) is a dual three-lane trunk road of about 4.7 km connecting West Kowloon with the proposed Kai Tak Development. It will further connect to the road network in Kowloon Bay. It will

provide a new strategic road link across central Kowloon and relieve traffic congestion at peak hours on the existing east-west road links. It is estimated that upon the commissioning of the CKR the journey time between West Kowloon and Kowloon Bay via CKR would only take around 5 minutes. Detailed design of CKR is actively underway.

Highways Department: Highways Department undertakes the planning, design, construction and maintenance of the public road system as well as planning and implementation of the railway system. The department's expenditure for the 2015/16 financial year totalled \$45.4 billion, of which \$0.9 billion was for road and public lighting maintenance and \$20.2 billion for major highway construction and \$24.3 billion for railway construction. The department is also responsible for issuing Excavation Permits and conducting audits of the excavation works on public roads.

Highways Department has an establishment of approximately 500 professionals and 1 600 staff of other grades. It consists of a Headquarters, two Regional Offices — namely Urban and New Territories Regions, a Railway Development Office, a Major Works Project Management Office and a HK-Zhuhai-Macao Bridge Hong Kong Project Management Office.

The Headquarters has seven divisions, ten units which provide specialist services to other offices of the department. The work of each Regional office falls broadly into district administration and highway maintenance. Owing to Hong Kong's rugged terrain, typhoons and rainfall, emergency control centres have been established in Regions and Tsing Ma & Tsing Sha Control Areas to deal with emergency matters such as washouts, fallen trees and landslips.

The Railway Development Office oversees and co-ordinates all necessary administrative arrangements relating to railway development.

The Major Works Project Management Office is responsible for managing, planning and implementing the high priority strategic route and other major highway projects.

The HZMB Hong Kong Project Management Office is responsible for the planning and implementation of the HZMB and its related infrastructure projects including the HKLR and associated boundary crossing facilities within HKSAR and various strategic highway infrastructure projects identified under the Northwest New Territories Traffic and Infrastructure Review.

Highways Department has strong links with the Police and Transport Department. The department also works closely with Building Authority regarding the roads and drainage aspects of private developments.