The transport policy objectives in Hong Kong are to provide and maintain a safe, efficient and reliable transport system in an environmentally acceptable manner for the city’s development. Transport infrastructure need to be integrated well with the city’s land use planning to reduce travel demands, the pressure on the transport system and the environment. Highways in Hong Kong are designed to connect the main centers of population and activities; however, this does not mean their locations are confined to urban area. Highways can be situated in both urban and rural area and traverse through both areas. They are also designed under a higher and stricter standard than ordinary trunk road or primary distributor roads. Currently, there are more than 20 highways in Hong Kong, approximately 145.5 km (90.4 mi) in total. Three of them are built in the past decade, they are the “Hong Kong – Shenzhen Western Corridor”, “Kong Sham Western Highway” and the “Penny’s Bay Highway”. Their lengths are 5.5km, 5.4km and 1.5km respectively. The first two were built in 2007 in response to the fact that the existing links between Hong Kong and Shenzhen were near saturation and expected to reach the capacity in 2006. The two highways act as new cross border infrastructure to connect the two cities. For the Penny’s Bay Highway, it was built in 2005 and links the North Lantau Highway to Hong Kong Disneyland Resort. Some of the highways that are planned or under construction include the Tuen Mun- Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB). The TM-CLKL is a 9km long dual 2-lane highway between Tuen Mun and North Lantau. The construction has started in 2013 and the south and north connection of the link are expected to complete by 2016 and 2018 respectively. For the TMWB, preliminary design and assessments are still in progress. TM-CLKL and TMWB will provide the most direct link between the Northwest New Territories (NWNT) and the Hong Kong - Zhuhai – Macao Bridge, also the airport and Lantau. This route will reduce the travel time between NWNT and Lantau significantly to release capacity of existing roads and offer support to logistics industry through providing access to the airport.

For existing highways, there are also plans for reconstruction, improvement or adding capacity into the highway. Like the Tuen Mun Road reconstruction project which has started in 2008. Since the Tuen Mun Road was built in 1977, the facility’s standards may not be the most updated, the project would bring the road up to current standard as far as practicable. Actions include reconstruction of pavement, widening of traffic lanes, upgrading the roadside slopes… etc. Moreover, the Tuen Mun Road Town Center Section was widened from a dual 2-lane carriageway to a dual 3-lane carriageway in February 2014. This would help to relieve congestion and to meet anticipated traffic growth in the district. As we can see, highways in Hong Kong are usually built in response to economic growth, new business development, increase in traffic demands… etc. It is not necessary for them to be situated in urban areas, sometimes they can provide the function of connecting urban and rural areas, even to the nearby city in mainland China.

Highways in Hong Kong are subjected to a higher building standard since they are supposed to carry a high volume of traffic at a higher speed. For a dual carriageway freeway with 2 lanes, 3 lanes and 4 lanes, the minimum carriageway widths are 7.3m, 11m and 14.6m respectively. Each highway will be incorporated with a 3.2m width central reserve. While the minimum carriageway widths for 2-lane, 3-lane and 4-lane primary distributor roads are 6.75m, 10m and 13.5m. Wider roads are required for highways to accommodate more vehicles. A nearside hard shoulder should be provided on all sections of the highway and any pedestrian facilities should be completely segregated from vehicular traffic. Currently, the Hong Kong government has no plan for removing any highways in the city.

Driving on highways in Hong Kong is not charged except for the Lantau Link which links to the Hong Kong International Airport. There is not plan for charging highway users as well. In China, national highways are used to connect regional administrative centers, urban with population over 200,000 and major transportation hubs. The total length of the highways is estimated to be 118,000 km. Through the end of 2011, there are already 71,000 km of national highways.

The highways in China are supposed to alleviate the intense traffic congestion in the country to improve the competitiveness. As the income per capita is steadily increasing, transportation demand is expected to grow rapidly; capacity of the highway network has to be improved to accommodate various business development.

The capital city Beijing is the starting point of 7 national highways, radiating to different parts of the country, including Shanghai, Harbin, Hong Kong… etc. Since the highways in Beijing are relatively long, they are usually separated into many sections. Over the past decade, many sections were opened to traffic successively. However, among the 7 national highways, at least 5 of them are just partially finished. Some sections of the highway are still under construction.

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construction or in planning stage. For instance the G6 Beijing-Lhasa Expressway, the highway is supposed to reach Tibet and Lhasa, but due to the climatic and geological conditions, the last part of the highway still does not have a precise construction timetable.\(^6\)

There are also some controversies involve with the construction or planning of the highways. Like the G3 Beijing-Taipei Expressway, the China government plans to use this highway to connect mainland China with Taiwan. There is opposition from Taiwan and many people also question about the feasibility of building such highway. Taiwan authority does not admit such a development plan; it claimed that it is just a unilateral plan by mainland China. Due to safety and political reasons, Taiwan has never intended to devise such a complicated construction plan. Some of the political parties in Taiwan are worry about that the highway will be a way for the mainland army to invade Taiwan.\(^7\) Even if Taiwan does not oppose the plan, this sophisticated and extremely long highway still needs a huge amount of money for designing and developing techniques for the construction. It may take 20-30 years to complete the whole plan.\(^8\)

Also, for the G4 Beijing-Hong Kong-Macau Expressway, it will link up the mainland section with some highways in Hong Kong and also the Hong Kong- Zhuhai- Macau Bridge to reach the final destination Macau. However, the construction of the bridge was once stopped because of the judicial review on the bridge’s EIA report. A citizen claimed that the EIA report was not comprehensive enough in terms of the impact of the bridge on air quality.\(^9\) The construction of the bridge and more than 70 other relevant infrastructure was stopped and about 8.8 billion HKD was loss. The project was then delayed for more than 9 months.\(^10\)

As for the planning of new highways, the 7\(^{th}\) Ring Road is currently under construction. It is a highway with a length of 940km, connecting Beijing with Hebei Province. About 90km of the highway will be situated in Beijing and the rest of it will be covered by Hebei Province. The 7\(^{th}\) Ring Road is expected to open in 2017. After the completion of the highway, not only the traffic congestion problem can be solved, but also logistics and other issues. It can also promote the formulation of industry along the highway.\(^11\)

Last but not least, the Beijing authority is now planning to introduce weight charge system in some of the highways in the city, including G4 and G5 national highway. The weight charge system refers to charging vehicles according to the overall weight of the goods carrying, per

\(^6\) [http://baike.baidu.com/view/2160879.htm](http://baike.baidu.com/view/2160879.htm)

\(^7\) [http://big5.huaxia.com/tslj/jjsp/2013/08/3467100.html](http://big5.huaxia.com/tslj/jjsp/2013/08/3467100.html)

\(^8\) [http://b5.secretchina.com/news/13/08/10/508215.html?%E5%8C%97%E4%BA%AC%E6%AC%B2%E5%BB%BA%E9%AB%98%E9%80%9F%E5%85%AC%E8%B7%AF%E9%80%9A%E5%8F%B0%E5%8C%97%20%E5%B0%88%E5%AE%B6%E7%A8%B1%E4%B8%8D%E5%A4%A7%E5%8F%AF%E8%83%BD(%E5%9C%96)](http://b5.secretchina.com/news/13/08/10/508215.html?%E5%8C%97%E4%BA%AC%E6%AC%B2%E5%BB%BA%E9%AB%98%E9%80%9F%E5%85%AC%E8%B7%AF%E9%80%9A%E5%8F%B0%E5%8C%97%20%E5%B0%88%E5%AE%B6%E7%A8%B1%E4%B8%8D%E5%A4%A7%E5%8F%AF%E8%83%BD(%E5%9C%96))


\(^10\) [http://paper.wenweipo.com/2012/08/30/NS1208300003.htm](http://paper.wenweipo.com/2012/08/30/NS1208300003.htm)

kilometer rates...etc. Overloaded vehicles will be charged progressively. This can help to reduce the number of overload vehicles travel on the highway to prevent traffic accidents. 12

In Los Angeles, there are more than 30 highways including California State Route, U.S. Highway and Interstate highway. The Department of City Planning has the general aim of establishing a citywide strategy to achieve long-term mobility and accessibility within the city. One of the goals in the transport sector is to provide adequate accessibility to work opportunities, essential services and mobility for residents, workers, travelers in Los Angeles. To this end, highways are built in various locations to enhance the accessibility of different parts in the city. 13 Another goal is to create an integrated system of pedestrian priority street segments, bikeways and scenic highways which strengthens the city’s image and provides access to employment opportunities, services and open space. The street system has to be safe and convenient for pedestrian, bicycle so that the sidewalks along all designated major and secondary highways are maintained at a minimum 10-foot width. 14

There are clear designations and standards for different kinds of freeways in Los Angeles. Most of the highways in Los Angeles are built more than 40 or 50 years ago since the city is the pioneer in establishing highway system. But there are continuous improvement plan for different highways in the city to improve the performances of the highways. First of all, there are three kinds of highways in Los Angeles. They are the Major Highway – Class I, Major Highway – Class II and Secondary Highway. Highways with more than 50,000 average daily trips (ADT), four travel lanes in each direction during peak hours plus left turn lanes at signalized intersections and 3,200 vehicles per hour (vph) in each direction during peak hours are under the first category. They are required to have 12’ sidewalk and 13’ curb lane, 4 full-time through lanes, 2 part-time parking lanes and 1 median/left turn lane. The other two types of highways are under less strict requirement due to the lower utilization rate. 15

Several highway projects had been started in different highways to improve the performance and the utilization of the highway system in the city. For example the I-5 Widening and HOV project. The I-5 is one of the most congested highways in Los Angeles and its capacity is no longer enough for the city’s population and transportation needs. The 3 lanes highway has a low speed traffic speed at below 20 mph or just slightly faster at 25 mph, cars are moving very slowly and cause serious congestion. 16 Therefore, the project would add capacity to the highway by widening it from 3 general purpose lanes to 4 general purpose lanes with one high-occupancy vehicle (HOV) lane in each direction. In total, there will be 5 lanes in each direction. In addition to widening the highway, the project will also upgrade it to current design  

13 http://planning.lacity.org/cwd/gnlPln/TransElT/T4Objctv.htm#goalab
14 http://planning.lacity.org/cwd/gnlPln/TransElT/T4Objctv.htm#goalac
15 http://planning.lacity.org/cwd/gnlPln/TransElT/T6StStd.pdf
16 http://www.sgvtribune.com/general-news/20131207/i-5-widening-project-will-connect-la-to-orange-county-in-a-bigger-way
standards, 18 structures including bridges, overcrossings and under crossings along the highway will be upgraded with major reconstruction. The project has started in 2013 and will continue until late 2017 or early 2018.

Another highway example is the I-405 Sepulveda Pass Improvements Project, this project was finished in May 2014. A 10-mile HOV lane and supporting infrastructure such as ramps, bridges and sound walls were added to the highway. The Skirball Center Dr., Sunset Bl. and Mulholland Dr. bridges were removed and replaced. By adding capacity and supporting infrastructure to the highway, existing and forecasted traffic congestion can be reduced, a decrease in commuter time can improve mobility and mitigate air pollution problem in the area. The construction was more than 15 months behind schedule because a retaining wall built for the new car-pool lane was collapsed. This has extended the completion of the project and caused more than $100 million over budget. Citizens that are using the the I-405 were dissatisfied with the delay because the project has already caused inconvenience to them. The way connecting other destinations was blocked due to the construction and they have to avoid traffic by going out at off-hours, the delay had even make the situation worse. Pressure from the residents has pushed for the request of the federal review of the 405 project.

http://www.metro.net/projects/I-405/

Appendix

Highways in Hong Kong

1. Tuen Mun Road 16.2 kilometres (10.1 mi)
2. North Lantau Highway 12.8 kilometres (8.0 mi)
3. Tsing Long Highway 12.5 kilometres (7.8 mi)
4. Tolo Highway 11.3 kilometres (7.0 mi)
5. Fanling Highway 10.0 kilometres (6.2 mi)
6. Yuen Long Highway 10.0 kilometres (6.2 mi)
7. Island Eastern Corridor 8.6 kilometres (5.3 mi)
8. San Tin Highway 7.9 kilometres (4.9 mi)
9. Hong Kong–Shenzhen Western Corridor 5.5 kilometres (3.4 mi)
10. Kong Sham Western Highway 5.4 kilometres (3.4 mi)
11. West Kowloon Highway 5.1 kilometres (3.2 mi)
12. 大老山 Tate's Cairn Highway 4.2 kilometres (2.6 mi)
13. Sha Lek Highway 4.2 kilometres (2.6 mi)
14. Tsuen Wan Road 4.1 kilometres (2.5 mi)
15. (to the airport) Lantau Link 4.0 kilometres (2.5 mi)
16. Tsing Kwai Highway 3.5 kilometres (2.2 mi)
17. Sha Tin Road 3.4 kilometres (2.1 mi)
18. Kwun Tong Bypass 3.0 kilometres (1.9 mi)
19. Tai Po Road - Sha Tin Section 1.8 kilometres (1.1 mi)
20. Penny's Bay Highway 1.5 kilometres (0.93 mi)
21. Sha Tin Wai Road 1.4 kilometres (0.87 mi)
22. Cheung Tsing Highway 1.2 kilometres (0.75 mi)

National Highways in Beijing

G1 Beijing–Harbin Expressway
G2 Beijing–Shanghai Expressway
G3 Beijing–Taipei Expressway
G4 Beijing–Hong Kong–Macau Expressway
G5 Beijing–Kunming Expressway
G6 Beijing–Lhasa Expressway
G7 Beijing–Ürümqi Expressway
Highways in Los Angeles

Three types of highways

a. Major Highway - Class I

Selection Criteria: more than 50,000 ADT

Performance Criteria:
- four travel lanes in each direction during peak hours
  + left turn lanes at signalized intersections
- 3200 vehicles per hour (vph) in each direction during peak hours

b. Major Highway - Class II

Selection Criteria
- Major highways (Class II) should typically be located one mile apart in a grid system.
- 30,000 to 50,000 ADT

Performance Criteria:
- three travel lanes in each direction during peak hours
  + left turn lanes at signalized intersections.
- 2400 vph in each direction during peak hours

c. Secondary Highway

Selection Criteria:
- Secondary highways supplement the through-traffic carrying characteristics of major highways. They should typically be located one mile apart midway between major highways in a grid system.
- 20,000 to 30,000 ADT

Performance Criteria:
- two travel lanes in each direction during peak hours
  + left turn lanes at signalized intersections.
- 1400 vph in each direction during peak hours

19 http://www.stonebrowndesign.com/uploads/9/7/6/9/9769402/losangeleshighwaymap.png
Standards of highways

1. Major Highway-Class I \(^{(1)}^{(2)}^{(4)}\) • 126\(^{`}\) ROW
   • 12\(^{`}\) sidewalk/pkwy. + 13\(^{`}\) curb lane
   • 6 full-time through lanes
   • 2 part-time parking lanes
   • 1 median/lef turn lane

NB. The standard Major Highway-Class I cross section can accommodate transit priority treatment without lane or roadway modification. Peak-hour parking restrictions (TANS) may be required.

2. Major Highway-Class II\(^{(4)}^{(5)}\)
   a. standard\(^{(5)}\) • 104\(^{`}\) ROW
   • 12\(^{`}\) sidewalk/pkwy. + 13\(^{`}\) curb lane
   • 4 full-time through lanes
   • 2 part-time parking lanes
   • 1 median/lef turn lane

NB. The standard Major Highway-Class II cross section can accommodate transit priority treatment without lane or roadway modification. Peak-hour parking restrictions (TANS) may be required.

   b. pedestrian priority segments\(^{(4)}\) • 17\(^{`}\) sidewalk/pkwy. + 6\(^{`}\) curb pkg.
   • 4 full-time through lanes
   • All-day parking
   • 1 median/lef turn lane

3. Secondary Highway\(^{(1)}\)
   a. standard\(^{(2)}\) • 90\(^{`}\) ROW
   • 10\(^{`}\) sidewalk/pkwy. + 19\(^{`}\) curb lane
   • 4 full-time through lanes
   • All-day parking
   • 1 median/lef turn lane

   b. pedestrian priority segments\(^{(4)}\) • 15\(^{`}\) sidewalk/pkwy. + 6\(^{`}\) curb pkg.
   • 4 full-time through lanes
   • All-day parking

NB. Left turn lanes may be necessary at intersections with major or secondary highways, requiring removal of curb parking on both sides of the street and both sides of the intersection for the entire length of the standard flare section.