

RM1.9 BILLION PROJECT

'SMART' KILLS 2 BIRDS WITH 1 STONE

This engineering wonder has saved Kuala Lumpur billions in terms of flood damage and eased traffic flow



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THE Stormwater Management And Road Tunnel (SMART) system in Kuala Lumpur is the longest stormwater drainage tunnel in Southeast Asia and first dual-purpose tunnel in the world.

With a diameter of 13.2m and stretching 9.7km from Kampung Berembang lake in Ampang to the Taman Desa lake near Salak Selatan, it is a system designed to kill two birds with one stone — to tackle flash floods in the city centre and relieve traffic congestion in Jalan Tun Razak, Jalan Sungai Besi and the Loke Yew flyover in Pudu.

The RM1.9 billion project was made possible through a joint venture between the Malaysian Highway Authority, the Drainage and Irrigation Department (DID), the Malaysian Mining Corporation Bhd and Gamuda Bhd.

Construction began in November 2003, during which two tunnel boring machines from Germany were used.

The project was finally completed in 2007 after several delays.



The Stormwater Management And Road Tunnel has been featured alongside other prominent tunnels in top documentary channels. PIC BY AIZUDDIN SAAD

The project also consisted of a storage reservoir and twin box culvert to divert the floodwaters.

There are two portions of the tunnel — the stormwater and motorway channels — that operate in four modes.

The first mode operates during usual conditions of low rainfall without storms, and the motorway will remain open for motorists to use.

The second mode will be triggered when there is a moderate storm: The floodwaters will be diverted into a bypass tunnel in the lower channel. On the upper channel, vehicles are still allowed to pass through the tunnel.

The third and fourth modes are activated during a major storm, and all channels of the tunnel, with a combined capacity of three million cubic metres of

water, will be closed off to drain the floodwaters.

Before the mode is activated, all vehicles will be vacated and automatic water-tight floodgates will be opened.

The tunnel will remain closed for a maximum of 48 hours as cleaning takes place via pressure washing before it is reopened to traffic.

Putting in mind the safety aspect, First Responder and Medical Response Vehicles have been deployed in SMART in case of emergency. The tunnel is monitored 24/7 through the supervisory control and data acquisition monitoring and surveillance system, with more than 200 closed-circuit television cameras installed at various points.

The tunnel also connects the city centre to the south-bound portion of the North-South Expressway via Jalan Sungai Besi.

Motorists can bypass traffic jams on city roads and enjoy shorter travelling time by using the tunnel. For instance, travelling from the Jalan Sungai Besi interchange to the Jalan Tun Razak exit near the Kampung Pandan roundabout takes around four minutes in clear traffic, instead of 15 minutes before the project was completed.

The project was even featured in established international documentary programmes, including *Extreme Engineering* on the Discovery Channel and *Megastructures* on the National Geographic Channel.

It was also listed in the top 10 greatest tunnels in the world by CNN back in 2016. It was named alongside other prominent tunnels, including the Gotthard Base Tunnel in Switzerland, Guo-

hang Tunnel and Bund Sightseeing Tunnel in China.

CNN mentioned that SMART had saved local authorities billions of ringgit through the prevention of damage and disaster brought about by floods.

Denmark-based consulting engineering group Ramboll had also praised the project. Its head of tunnels, Alun Thomas, had previously explained how the engineering marvel worked wonders in controlling floods and relieving traffic congestion at the same time.

"SMART is a combined road and flood-relief system. It can be completely flooded to get rid of stormwater and turned back into a road in a few hours," he was quoted as saying.

Recently, the fourth mode was activated during the downpour on Sept 10 — the seventh time the highest level of flood was initiated in its history.

DID director-general Datuk Nor Hisham Mohd Ghazali recently said the diversion of three million cubic metres of water, if not done in time, could have flooded an area of 1km² radius from Masjid Jamek in Kuala Lumpur.

It was reported that if the SMART system was not activated to full capacity, a 15ha area in the city centre — the size of 20 football fields — could have been submerged that day. Many other low-lying areas were inundated with water that rose as high as three metres.

According to reports, five worst flood-hit areas on that day were Lebuhraya, Jalan Raja Alang (Kampung Baru), Lorong Air Eleh (Setapak), Jalan Gurun and Jalan San Ah Wing (Semarak). Without the tunnel, the situation could have been worse.



Datuk Nor Hisham Mohd Ghazali

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