

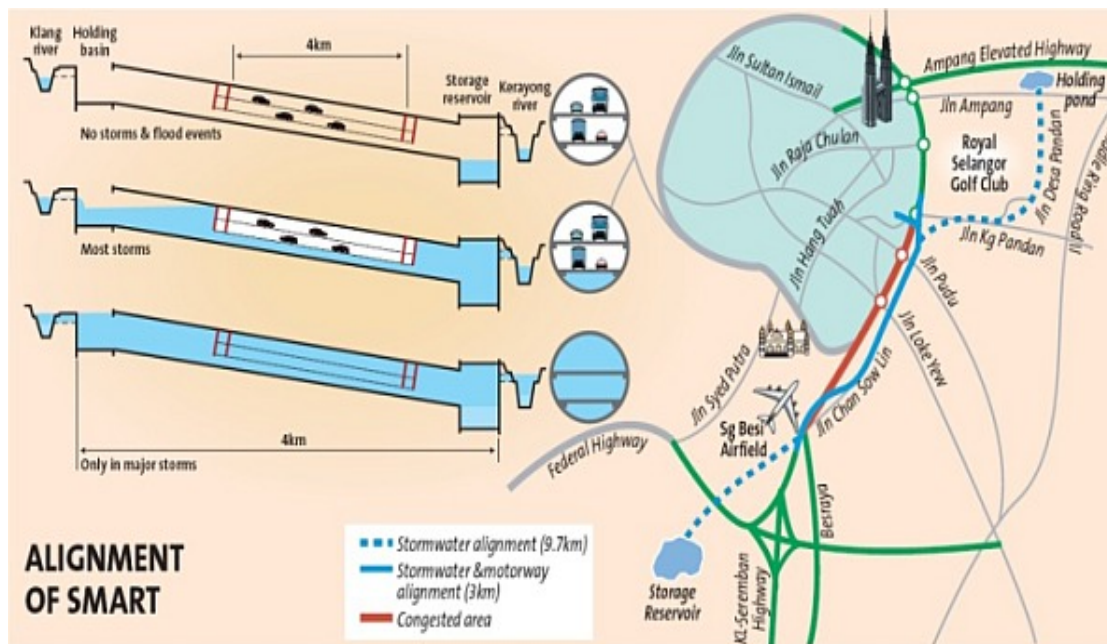
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Opening of SMART tunnel to reduce flood risks and traffic jams

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Photos by SAMUEL ONG

In April and October of 2001, and again in June 2003, massive floods in Kuala Lumpur caused serious damage. It was apparent that the rivers flowing through the city were unable to hold the water and space constraints did not permit river improvement work. It was then that the storm water management and road tunnel project (SMART) was offered as a solution to end flooding in the capital city. More than three years have gone by since construction began and the highway is due to open at the end of this month. STAR METRO gains an insight into the workings of this RM1.9bil tunnel.



WHEN the storm water management and road tunnel project (SMART) was offered as a solution to end two of the city's major problems – the flood and traffic crisis, many city folks were not sure about the workings of this mega project and wondered how it was going to rid the city off its perennial nuisance.

The very idea of a single tunnel that serves two distinct purposes is just mind-boggling and yet fascinating at the same time.

A tunnel built to rid flash floods and ease traffic congestion is indeed what the city needed but what worried people most was the fear that in the event of a flood what happens to those still inside it?



Water detour: The pump room where flood water will be pumped to the Department of Drainage and Irrigation's pump system.

SMART general manager (operations) Mohd Fuad Kamal Ariffin assures the public that safety is their top-most priority.

"Safety has been of paramount importance to us hence when designing the tunnel all safety features and precautions have been taken into consideration.

"We used state-of-the-art technology and unique safety features to build this tunnel," he said.

SMART's purpose is to solve the flood problem in the city, but it is also designed to relieve traffic congestion from the Kg Pandan roundabout to the KL–Seremban Highway at Sg Besi.

Primary Role: To solve Flooding

"The storm water tunnel helps divert flood water entering Sungai Klang and Sungai Ampang into a holding basin in Kg Berembang.

"The water will subsequently be channelled via the tunnel to a reservoir in Taman Desa before being released into Sungai Kerayong."

This process, Mohd Fuad said, would reduce the floodwater coming from Sg Klang and thereby preventing Sg Gombak and Sg Klang from bursting their banks and overflowing in the event of a storm.

It is the tunnel's primary role - to ease flooding caused by heavy rains at the confluence of Sg Klang and Sg Ampang.



Key gate: The flood gate which channels water to the Taman Desa holding pond.

Secondary Role: To ease Congestion

The secondary role is to relieve traffic congestion heading into and out of the KL-Seremban Highway.

Hence apart from the 9.7km-long water diversion tunnel, a 3km two-deck highway has been built inside as a means to kill two birds with one stone.

Work on the highway has been completed but it will only be opened at the end of the month while the storm water system will only be operational by the end of June.

“Once open the highway will provide motorists direct access to the Bukit Bintang area, a journey that will only take five minutes,” said Mohd Fuad, adding that 30,000 motorists are expected to use the SMART tunnel daily.

The tunnel is an alternative route for motorists to avoid the Jalan Tun Razak congestion.

In the case of Flooding

In the event of a flood, Mohd Fuad said the operation of the highway in SMART system would work on a three-principle mode.

Mode 1 is under normal condition, when there is not much rain there is no need to close the highway.

Mode 2 is when there is moderate storm, and some water needs to be diverted to the tunnel and confined to the lowest drainage chamber in the tunnel. A set of twin gates has been installed at either end of the tunnel and is kept shut at all times in order to keep traffic safe in the tunnel. The highway inside the tunnel will still be open.

Mode 3 is when there is a major storm and much larger discharge will have to be passed through the tunnel and hence the entire tunnel will have to be closed to traffic.

At this stage, the highway will be closed to traffic.

Variable messages signs (VMS) located at the highway entrance will inform motorists that the highway is closed and to use alternative routes.

Sufficient time will be given to allow the last vehicle to exit the highway before the automated floodgates are opened to allow water to pass through.

The highway will only be re-opened to traffic within 48 hours after closure.

“There can never be a situation where someone has been left behind as we're not going to close the flood gates until and unless everyone is out,” said Mohd Fuad.

What happens if there is traffic jam in the tunnel during a major storm?

“Then alternatives will be identified. Traffic from the highway heading towards the city centre will be diverted to the service road of Jalan Davis and off Jalan Tun Razak,” Mohd Fuad said.

While traffic heading south will be diverted onto the East-West link.

“Through the control centre in Jalan Davis we will be notified by the Drainage and Irrigation Department and and with help from the police and Kuala Lumpur City Hall motorists will be diverted to take alternative routes.

Safety a Priority

SMART's tunnel is unlike any other tunnel in the world. It has been built with unique features with emphasis on safety.

Automated Flood Gates – The water-tight gates are installed at either end of the highway tunnel to separate the highway from the storm water tunnel for the safety of the highway users.

The floodgates will remain closed at all time during traffic operation and opened only when the tilting road gates in the ingress and egress are closed.

The first line of protection against water entering the road tunnel is an emergency gate at each end. There will be five gates at either end of the highway: two floodgates, two road gates, and an emergency gate.

Emergency Exits – a cross passage between decks at 250m intervals acts as exits during an emergency.

Ventilation/escape shafts at 1km intervals – the air ventilators will constantly renew the air and maintain the air quality within the highway.

To protect the ventilation system during flooding, the system consists of a series of shafts each containing an exhaust and fresh air injector.

Equipped with fire-fighting equipment, telephone, over 200 CCTVs and surveillance at 1km intervals along the highway tunnel.

Control Tower – State-of-the-art SCADA technology has been especially designed for the monitoring and surveillance of the SMART tunnel.

- SMART stands for Stormwater Management and Road Tunnel.
- Project initiated to alleviate flood problems in KL.
- Project is implemented through a joint venture with MMC Berhad and Gamuda Berhad.
- SMART is implemented under the close supervision of the government, namely the Drainage and Irrigation Department of Malaysia and Malaysia Highway Authority.
- Local consultant Sepakat Setia Perunding Sdn Bhd in association with Mott MacDonald of UK provides engineering support.
- Costing a whopping RM1.9bil, this major investment will be recovered through toll collection for a period of 40 years.