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### DOCUMENT CONTROL

REV	DOCUMENT TITLE & COPY NUMBER	Date	Prepared by	Reviewed by	Approved by
0	Sentosa Gateway Congestion Mitigation Operations Copy____of ____	15 <sup>th</sup> December 2009	Melvin Yeo (SOE)	Alfred Loh (SOE)	Soh Ling Tim (MOPN)
1	Sentosa Gateway Congestion Mitigation Operations Copy____of ____	XX October 2013	Chiam Zhi Wei (DysOE) Chua Teck Leong (AOM, ITSO OCC)	Ng Soon Han, Frankie (DOM, ITSO OCC)	Yeo Se Lay (SM,Ops)
2	Sentosa Gateway Congestion Mitigation Operations Copy____of ____	XX December 2020	Daniel Wu (AOM) Lye Keng Fatt (DM, ITSO OCC)	Ng Soon Han, Frankie (Mgr, ITSO OCC)	Yeo Se Lay (DDIT)

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### AMENDMENT HISTORY RECORD

Rev No.	Effective Date of Change	Section & Sub- Section Amended	Amendments/ References	Party Requesting for Change
1	XX Oct 2013	Whole Document	Due to organization change of division name from ITSO to ITSO.	DOM, ITSO OCC
2	XX Dec 2020	Whole Document	Due to change of Staff Designations in ITSO OCC. Delete SOE, insert DM Delete DySOE, insert DyAM	Mgr, ITSO OCC

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## Section 1. Introduction

- 1.1.1 With the opening of Resorts World Sentosa RWS (there will be an expected increase in both crowd and vehicle movement into and out of Sentosa.
- 1.1.2 During special events and even normal daily peaks need the intervention and co-operation of all partners within the Sentosa gateway precinct and the state to mitigate any congestion that may result from a sudden inflow and outflow of vehicles from Sentosa.
- 1.1.3 The precinct partners are RWS, Sentosa Development Corporation, Vivo City, St. James, Singapore Police Force and LTA.

## Section 2. Personnel Involved

- a) ITSO OCC staff
- b) ITSO Ops & Planning staff
- c) External Agencies
- d) Precinct Partners

## Section 3. Actions & Process

### Sub-Section 3.1 Normal Daily Peak

- 3.1.1 For daily operations Sentosa Gateway area shall be monitored by Zone “B “ with SGT OE and DyAM. DM shall provide the necessary supervision.
- 3.1.2 For any situation requiring the opening up of the dynamic lane the DyAM & DM shall follow the process reflected in ITSO/OCC/SOP/NOP02.014.
- 3.1.3 ITSO OCC shall handle monitor & work closely with the various agencies and stakeholders security representatives (Contact Numbers are reflected in Attachment 1) in managing the junctions around the HarbourFront area. These include Telok Blangah/Kampong Bharu junction, Telok Blangah/Sentosa Gateway junction, Telok Blangah/ HarbourFront Walk junction, Telok Blangah/ Harbourfront Ave. junction and Telok Blangah/Henderson Rd junction.
- 3.1.4 For any congestion observed zone OE shall adjust the traffic lights according to the congested approach and at the same time inform the relevant stakeholder security representative if the cause of congestion is seen to be originating from the stakeholders premises so that they can take the appropriate measures.
- 3.1.5 For any congestion from Sentosa Island or RWS with tailback observed from the webcams to be on the bridge ITSO OCC will inform SDC's rangers or representative so that they can implement their congestion mitigation measures.
- 3.1.6 If Sentosa or RWS is turning away vehicles ITSO OCC shall facilitate by giving more green time to vehicles on the Sentosa Gateway approach and to flush if necessary without adversely affecting Telok Blangah Rd approach too much (Note for any tweaking of traffic lights, the tailback on Telok Blangah Rd should not reach the half way point on the down ramp of AYE exit slip).

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- 3.1.7 Zone “B” OE shall open IR for any slow traffic observed and implement “Heavy Traffic at Telok Blangah Rd” on AYE (Tuas) will be implemented if traffic is observed to tailback till Telok Blangah/Kampong Bahru Rd. DyAM to monitor for mediacorp broadcast
- 3.1.8 ITSO OCC will deploy LTM if necessary for any traffic diversion, when the congestion reaches the Kampong Bahru junction. SMS escalation to management required.
- 3.1.9 For any events or advance events planning the process is reflected in ITSO/OCC/SOP/AOP03.006
- 3.1.10 For any radio messages that need to be broadcast but unable to be done via the IW incident record (e.g Sentosa & RWS carparks full), to manually fax to traffic watch during traffic watch operational hours, outside the traffic watch operational hours to call Head ITSO OCC for assistance.

### **Sub-Section 3.2 Congestion Due Incident**

3.2.1 For any Incident along Sentosa Gateway and Sentosa Island:

- SDC to deploy rangers for incident recovery
  - TP & SPF to be activated
  - ITSO OCC shall disseminate traffic information (via radio broadcast and EMAS) to motorists.
  - ITSO OCC shall deploy LTM & VRS if necessary. (For Sentosa Gateway incident recovery, cost should be recovered from SDC.)
  - LTM / SDC Rangers/SPF to conduct traffic diversion. Diversion point to be decided by TP/SPF
- Note ITSO OCC shall escalate via sms to management

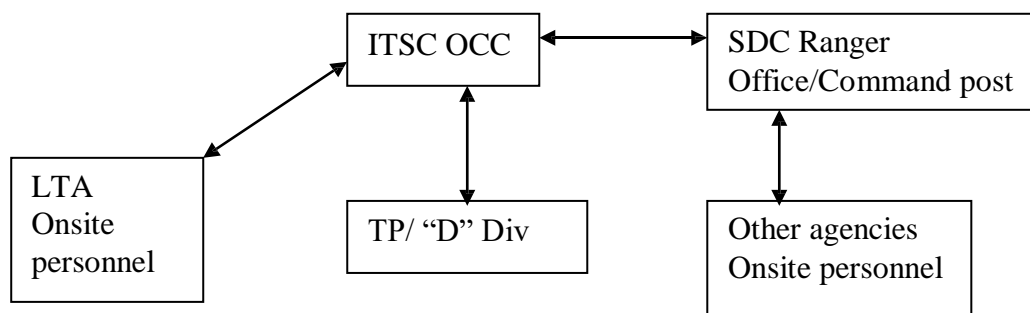
3.2.2 For any incident along Telok Blangah Road:

- TP & SPF to be activated for incident management
- ITSO OCC shall disseminate traffic information (via radio broadcast and EMAS) to motorists & fine-tune traffic signals
- ITSO OCC shall deploy LTM & VRS if necessary for incident recovery and/or traffic diversion.

3.2.3 Train disruption service, either Sentosa Express or NEL HarbourFront:

- ITSO OCC will disseminate traffic congestion information to motorists
- ITSO OCC will tweak traffic signals
- Inform LTOC and SPF/TP of any congestion resulting from the train service disruption.
- SDC will encourage affected passengers to use the broadwalk.
- SBST agreed not to use Vivo City bus stop for boarding of bus bridging services due to NEL disruption, this bus stop will only be used for alighting of passengers only.

3.3.4 Communications Protocol:



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#### **Section 4. Abbreviations**

CCTV Close Circuit TV  
 ITSO Intelligent Traffic System Operations  
 IR Incident Record  
 LTA Land Transport Authority  
 LTM Land Transport Authority Traffic Marshals  
 NEL North East Line  
 OE Operations Executive  
 OCC Operations Control Center  
 DyAM Deputy Assistant Manager.  
 RIM Road Infrastructure Management  
 RWS Resorts World Sentosa  
 SBST SBSTransit  
 SDC Sentosa Development Corporation  
 DM Deputy Manager  
 SPF Singapore Police Force  
 TP Traffic Police  
 VRS Vehicle Recovery Service  
 VMS Variable Message Signs

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## **ATTACHMENT 1-HarbourFront Precinct Partners**

### **Contact:**

Sentosa Ranger Office	:	62791155, 62791156
Yizid (SDC Ranger PIC)	:	9784 7762
Mindy (Vivocity Ops Asst manager):		91001488
Vivocity Security	:	63769158
Harbourfront Centre Security	:	63776223
Harbourfront Centre Fire Control Centre:		63769158
Clementi Police Ops Room	:	68727765, 68727766
Duty Officer	:	67767820
TP Command Post	:	6547 6016/6018

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## Attachment 2-Sentosa Causeway Bridge Congestion Markers



## Causeway Bridge Tower 1 &amp; 2 Markers

## Note:

- 1) The above markers are the various congestion triggering points to inform the SDC rangers once the congestion tailback has reached the markers for in bound Sentosa traffic.
- 2) For out bound Sentosa traffic once the congestion tailback reaches the causeway bridge half-way markers, ITSC OCC will give more green time to the Sentosa Gateway approach without adversely affecting the Telok Blangah Rd traffic. **IF** measure does not work and tailback goes past the half way marker, Duty DM will inform Head ITSO OCC who will in turn inform management for a decision to activate dwelling in favour of Sentosa Gateway approach (ITSO OCC must give a real time verbal situation report of Telok Blangah Rd to Head ITSO OCC to relay to management so that an informed decision can be made).

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## **ATTACHMENT 3-Congestion Diversion Plans.**

### **A3.1) Plan 1-Congestion due to carparks full or slow admission processing (Without Incidents).**

A 3.1.1 When carparks are full or admission processing is slow, Sentosa and RWS shall implement their own traffic management schemes within Sentosa Island itself to prevent traffic congestion tailback, will include diverting visitors away from Sentosa island via the roundabout.

A 3.1.2 When SDC is diverting traffic out of Sentosa Island they will inform ITSO OCC, which in turn will give more green time at Sentosa Gateway/Telok Blangah junction in favour of Sentosa gateway approach without adversely affecting Telok Blangah Rd approach

A 3.1.3 ITSO OCC shall monitor the webcams and inform SDC Rangers office once the tailback (and vehicles are not moving for 5mins) and reaches the half-way point on Sentosa causeway, ITSO OCC shall inform SDC rangers office and monitor the situation.

A 3.1.4 If the congestion tailback reaches tower 1 & 2 on the Sentosa Causeway, ITSO OCC will call SDC Ranger's office to inform them of the situation.

A 3.1.5 OEs shall implement the following messages on TIPs, upon trigger from SDC, this is only for **when carparks for both RWS & Sentosa are full** "CARPARKS FULL AT SENTOSA ISLAND, USE ALTERNATIVE CARPARKS". Fax the predetermined fax to traffic watch or call Head ITSO OCC during traffic watch non-operational hours.

A 3.1.6 Normalize all activated equipment once SDC call to report carpark situation is no longer full.

A 3.1.7 For all conversations with SDC please get the callers name.

\* Note: The processes above were in consultation and agreement with 'D' division, TP and SDC.

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## Plan 1A) Carpark full for Sentosa Island



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### Plan 1B) RWS Ramp A slow down causing congestion to towers 1& 2 markers



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**A3.2) Plan 2-Congestion Due To Incidents****Incident with Lane blockage**

A 3.2.1 When there is a traffic incident affecting lane capacity along Sentosa Gateway or the Sentosa Causeway i.e. 1 out of 3 lanes closed or 2 out of 3 lanes closed due incident. ITSO OCC shall open an IR monitor the situation, inform 'D' division/TP and ITSO OCC implement the appropriate messages if required.

A 3.2.2 If the incident is on the Sentosa Causeway and there is a congestion tailback, TP/SPF may affect traffic diversions if situation requires a diversion. TP or SPF shall inform ITSO OCC of any diversion so that the traffic lights can be adjusted, appropriate messages implemented and inform our management.

A 3.2.4 ITSO shall activate LTM (if required) and VRS (if incidents involves vehicles or obstacles blocking lane or lanes).

A 3.2.5 If traffic incident is on Telok Blangah Road ITSO shall inform 'D' division/TP and implement the appropriate messages if required. VRS will be dispatched to assist (LTM to be activated to open up the dynamic lane if the incident is near to the dynamic lane area refer to ITSO/OCC/SOP/NOP02.014 for details).

A 3.2.6 SPF/TP shall inform ITSO OCC if diversion is required, if required ITSO OCC shall implement the appropriate messages, adjust traffic light and inform management.

**Incident with total blockage on one bound**

A 3.2.7 For situations where one bound of the access to Sentosa Gateway is blocked, reverse flow needs to be activated. SDC shall be the triggering agency in declaring the implementation of the reverse flow scheme. Note this means that if ITSO OCC detects and confirm a one bound blockage and ITSO OCC will inform SDC, SDC shall inform that they are initiating the plans and ITSO OCC shall inform TP & 'D' division. If incident is detected by SDC and confirmed, they shall inform ITSO OCC of implementation of reverse flow plan (see diagrams below for details). ITSO OCC will inform TP & 'D' division.

NOTE: For both types of incident, message for display on TIDs 4103, 4107, 3196 & 3198 “ \_\_\_\_\_(to fill in nature of incident) AT SENTOSA GATEWAY, AVOID JAM AT TELOK BLANGAH RD”

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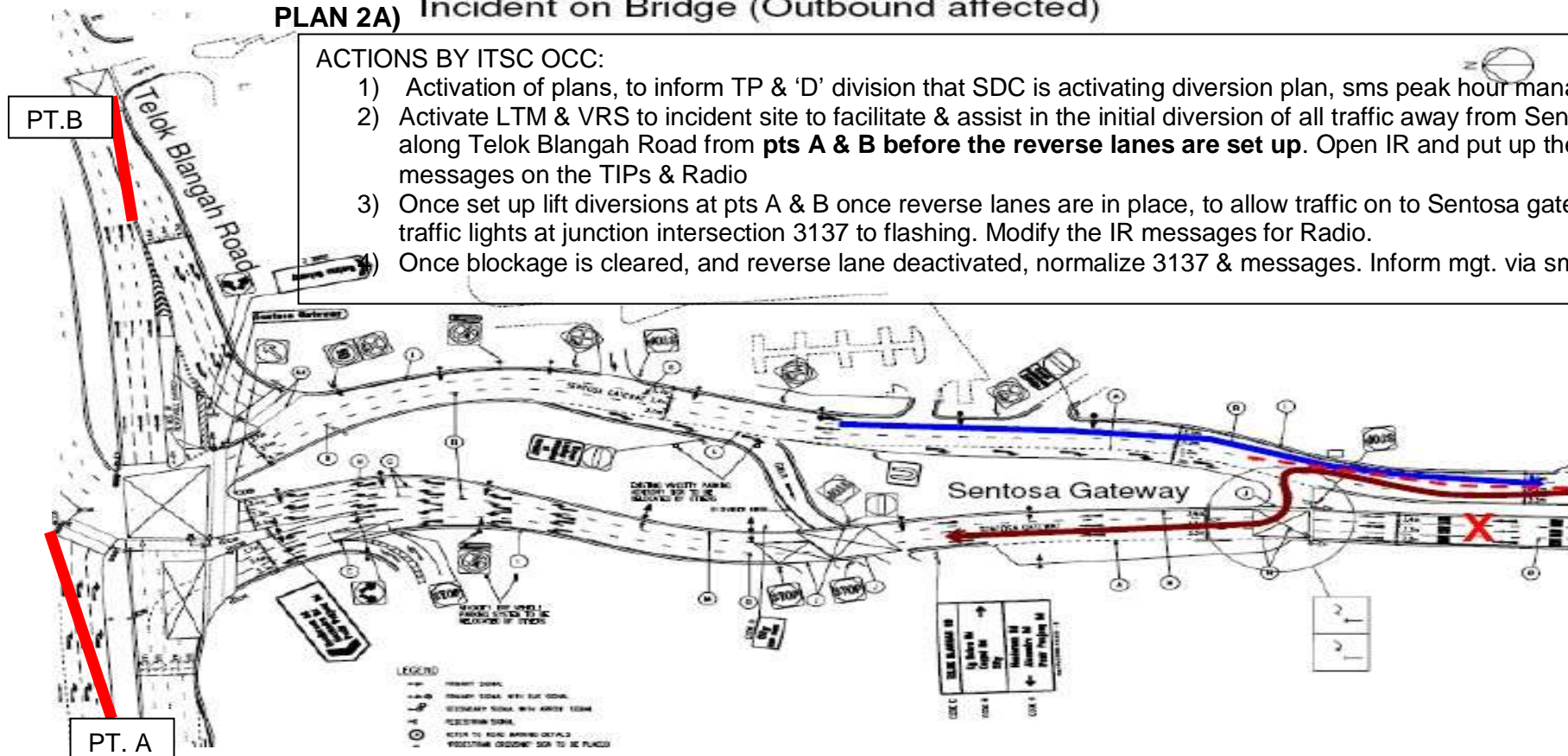
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### Reverse Flow Diversion Due Incident Affecting One-bound of the Bridge

#### PLAN 2A) Incident on Bridge (Outbound affected)

##### ACTIONS BY ITSC OCC:

- 1) Activation of plans, to inform TP & 'D' division that SDC is activating diversion plan, sms peak hour management of incident
- 2) Activate LTM & VRS to incident site to facilitate & assist in the initial diversion of all traffic away from Sentosa Gateway along Telok Blangah Road from **pts A & B before the reverse lanes are set up**. Open IR and put up the respective VMS messages on the TIPs & Radio
- 3) Once set up lift diversions at pts A & B once reverse lanes are in place, to allow traffic on to Sentosa gateway. Activate the traffic lights at junction intersection 3137 to flashing. Modify the IR messages for Radio.
- 4) Once blockage is cleared, and reverse lane deactivated, normalize 3137 & messages. Inform mgt. via sms.



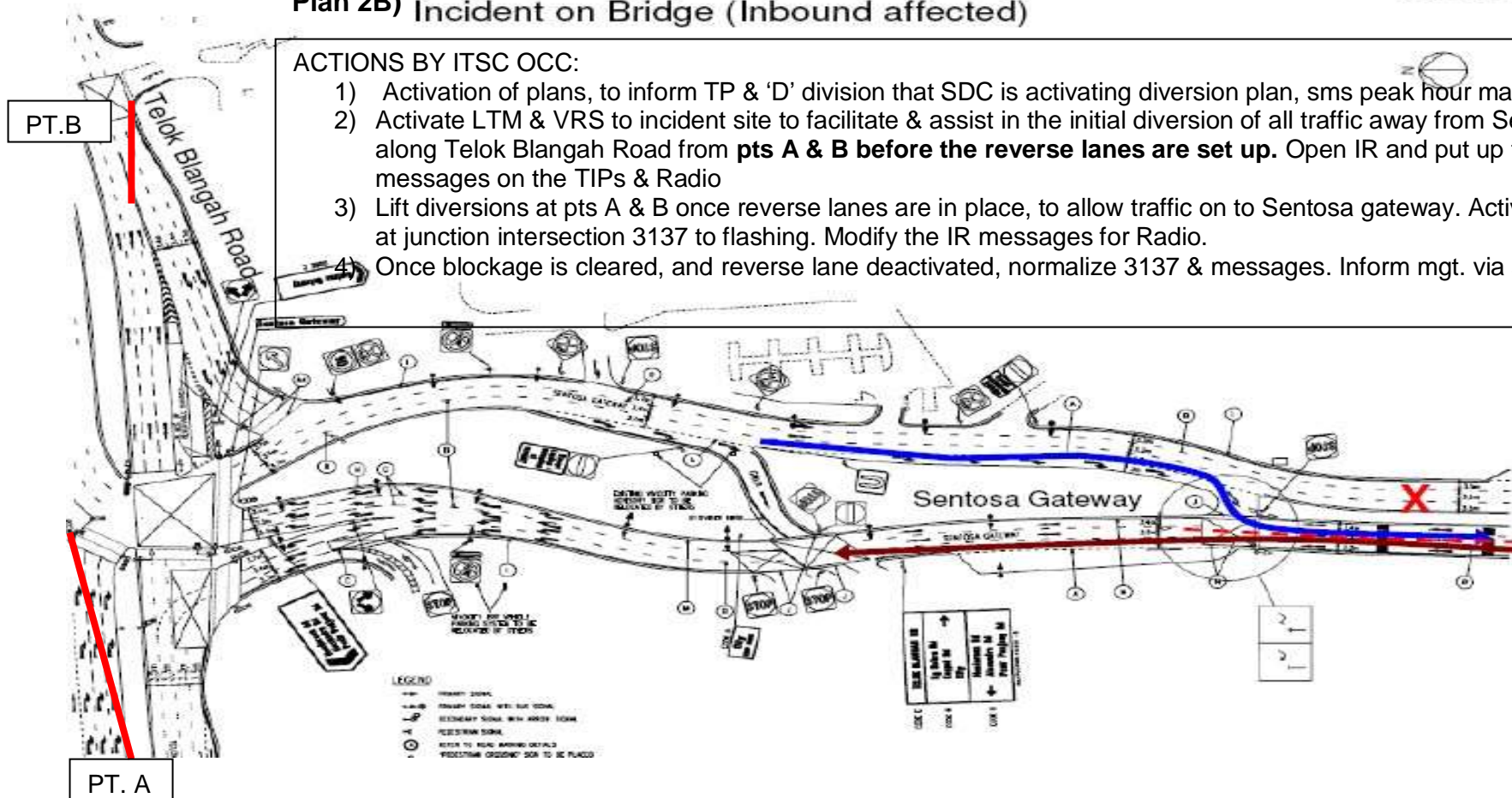
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### Plan 2B) Incident on Bridge (Inbound affected)

#### ACTIONS BY ITSC OCC:

- 1) Activation of plans, to inform TP & 'D' division that SDC is activating diversion plan, sms peak hour management of incident
- 2) Activate LTM & VRS to incident site to facilitate & assist in the initial diversion of all traffic away from Sentosa Gateway along Telok Blangah Road from **pts A & B before the reverse lanes are set up**. Open IR and put up the respective VMS messages on the TIPs & Radio
- 3) Lift diversions at pts A & B once reverse lanes are in place, to allow traffic on to Sentosa gateway. Activate the traffic lights at junction intersection 3137 to flashing. Modify the IR messages for Radio.
- 4) Once blockage is cleared, and reverse lane deactivated, normalize 3137 & messages. Inform mgt. via sms.

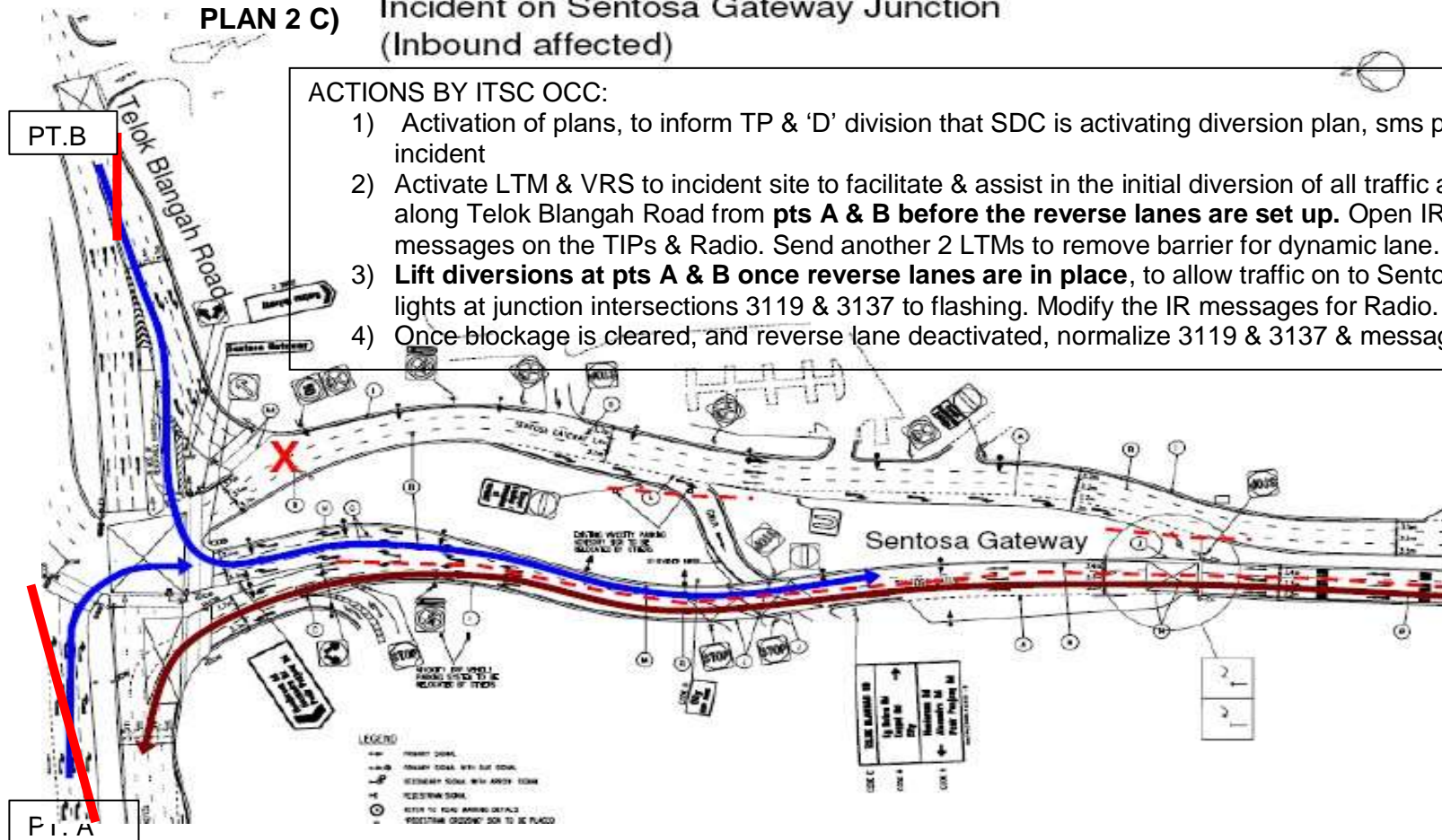


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### PLAN 2 C)

### Incident on Sentosa Gateway Junction (Inbound affected)



#### ACTIONS BY ITSC OCC:

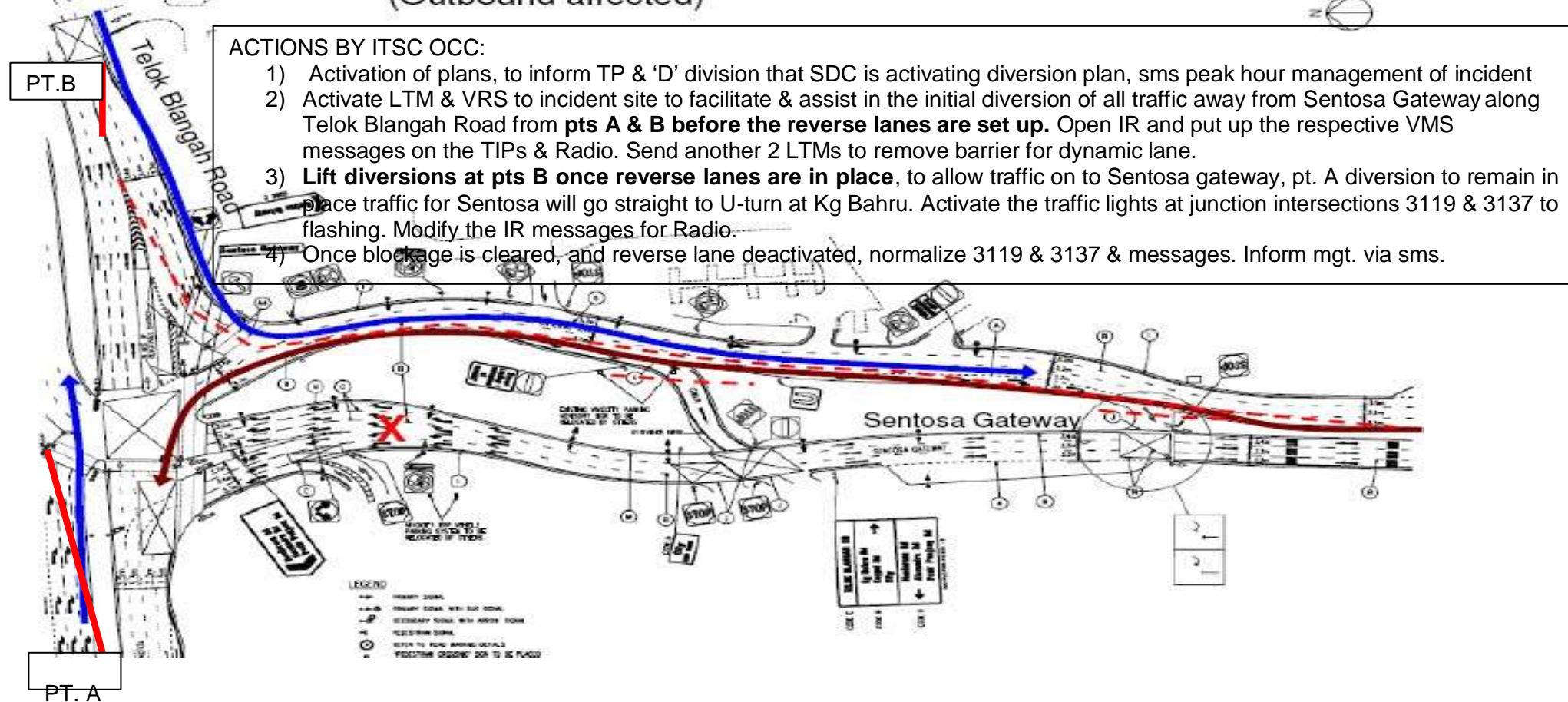
- 1) Activation of plans, to inform TP & 'D' division that SDC is activating diversion plan, sms peak hour management of incident
- 2) Activate LTM & VRS to incident site to facilitate & assist in the initial diversion of all traffic away from Sentosa Gateway along Telok Blangah Road from **pts A & B before the reverse lanes are set up**. Open IR and put up the respective VMS messages on the TIPs & Radio. Send another 2 LTMs to remove barrier for dynamic lane.
- 3) **Lift diversions at pts A & B once reverse lanes are in place**, to allow traffic on to Sentosa gateway. Activate the traffic lights at junction intersections 3119 & 3137 to flashing. Modify the IR messages for Radio.
- 4) Once blockage is cleared, and reverse lane deactivated, normalize 3119 & 3137 & messages. Inform mgt. via sms.

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### Incident on Sentosa Gateway Junction (Outbound affected)



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### **A2.3) Plan 3-Traffic Diversion due High Risk Security Threat or Crisis on Sentosa Island**

A 3.3.1 If the incident is catastrophic or of high security risk in nature (as determined by SCDF or SPF) diversion will be affected by SPF to divert traffic up to West Coast Highway, for traffic along Kampong Bahru, to be diverted at Lower Delta/Kampong Bahru junction and for traffic along Telok Blangah Road towards city right turn into Sentosa will be closed off. TP or SPF shall inform ITSO OCC of any diversion so that the traffic lights can be adjusted, appropriate messages implemented and inform our management.

A 3.3.2 ITSO shall activate LTM (if required) and VRS (if incidents involves vehicles or obstacles blocking lane or lanes).

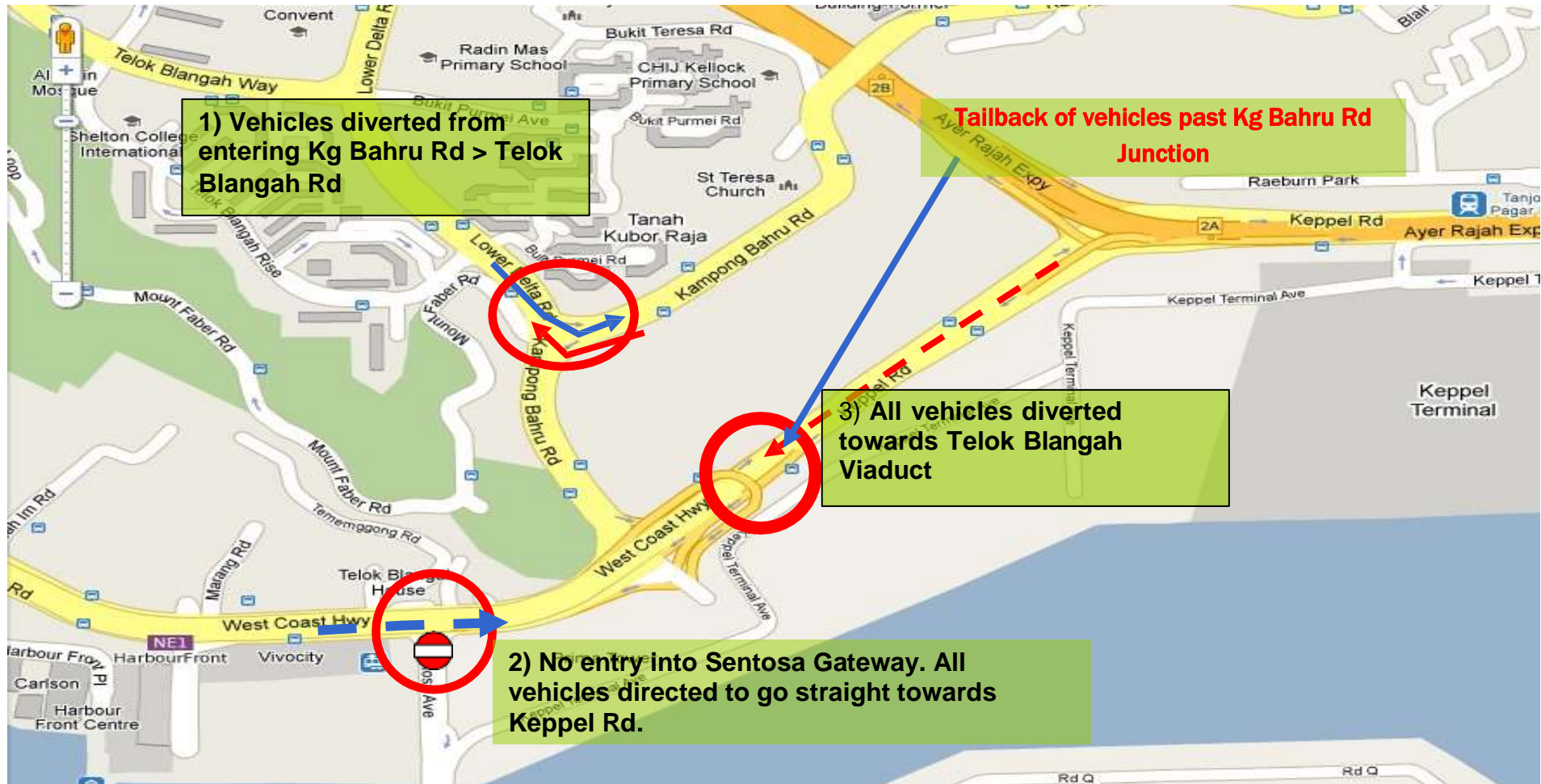
A 3.3.4 SPF/TP shall inform ITSO OCC if diversion is required, if required ITSO OCC shall implement the appropriate messages, adjust traffic light and inform management.

A 3.3.5 Message for display on TIDs 4103, 4107, 3196 & 3198 “RD DIVERSION AT TELOK BLANGAH RD, AVOID JAM AT TELOK BLANGAH RD”

Note: The processes above were in consultation and agreement with ‘D’ division, TP and SDC

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