

# Special event planning and management: Micro operations in the macro landscape. A case study of the Singapore Grand Prix

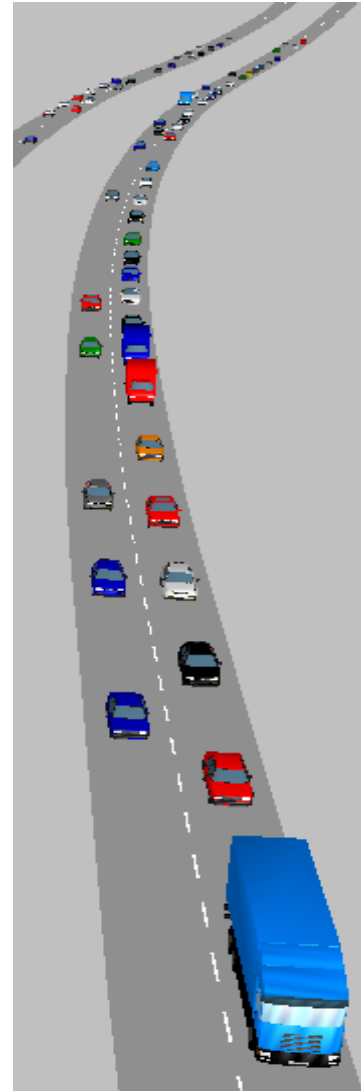
IPENZ Transportation Conference, Christchurch 15<sup>th</sup> – 17<sup>th</sup> March 2010



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## Presentation Outline

- > The issue
- > PTV Experience in Special Event Planning
- > VISUM Model Development
- > VISSIM Micro-simulation model refinement
- > VISUM to VISSIM comparison
- > The Special Event : Singapore Grand Prix



## The issue

- > Northern half of Singapore Central Business District
- > Significant number of key arterial routes
- > Heavily congested
  - > High volume traffic flow and pedestrian crossing volumes
- > Various occasional events
  - > Exhibitions/ Conferences
  - > National Day Parades
  - > Singapore Grand Prix
- > Singapore Land Transport Authority needs to evaluate /manage / ameliorate impacts across network



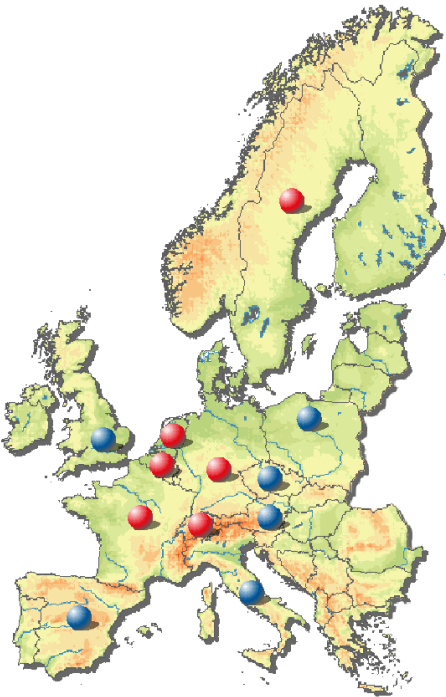
## Technical issue

- > How to model operational complexities in a simulation without immediate focus on the individuality of vehicles.

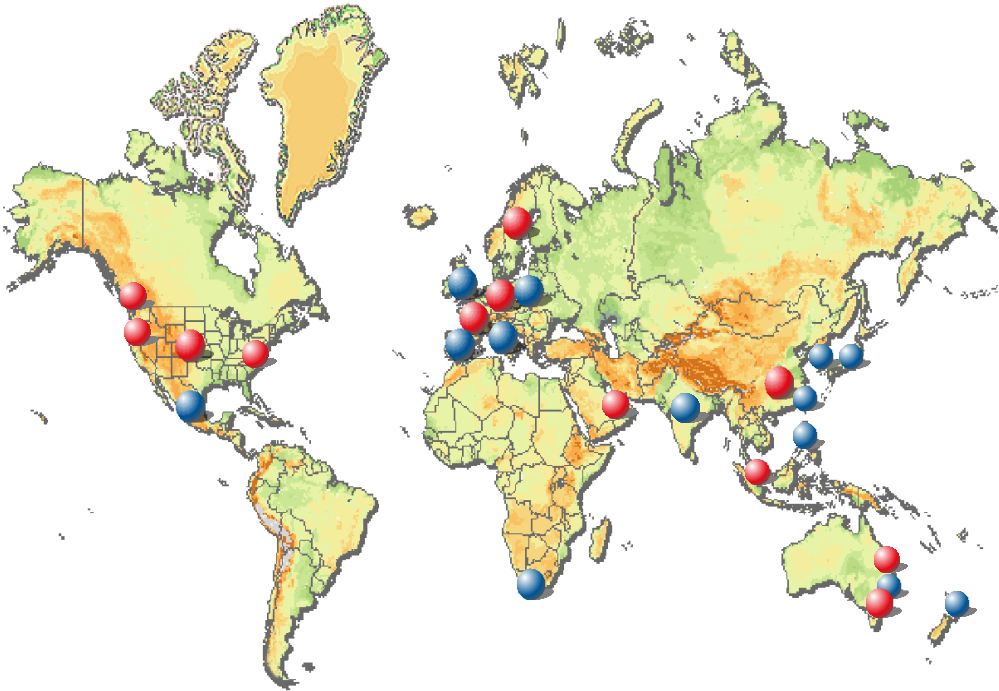
# Background



# International Branches and Partners

Europe



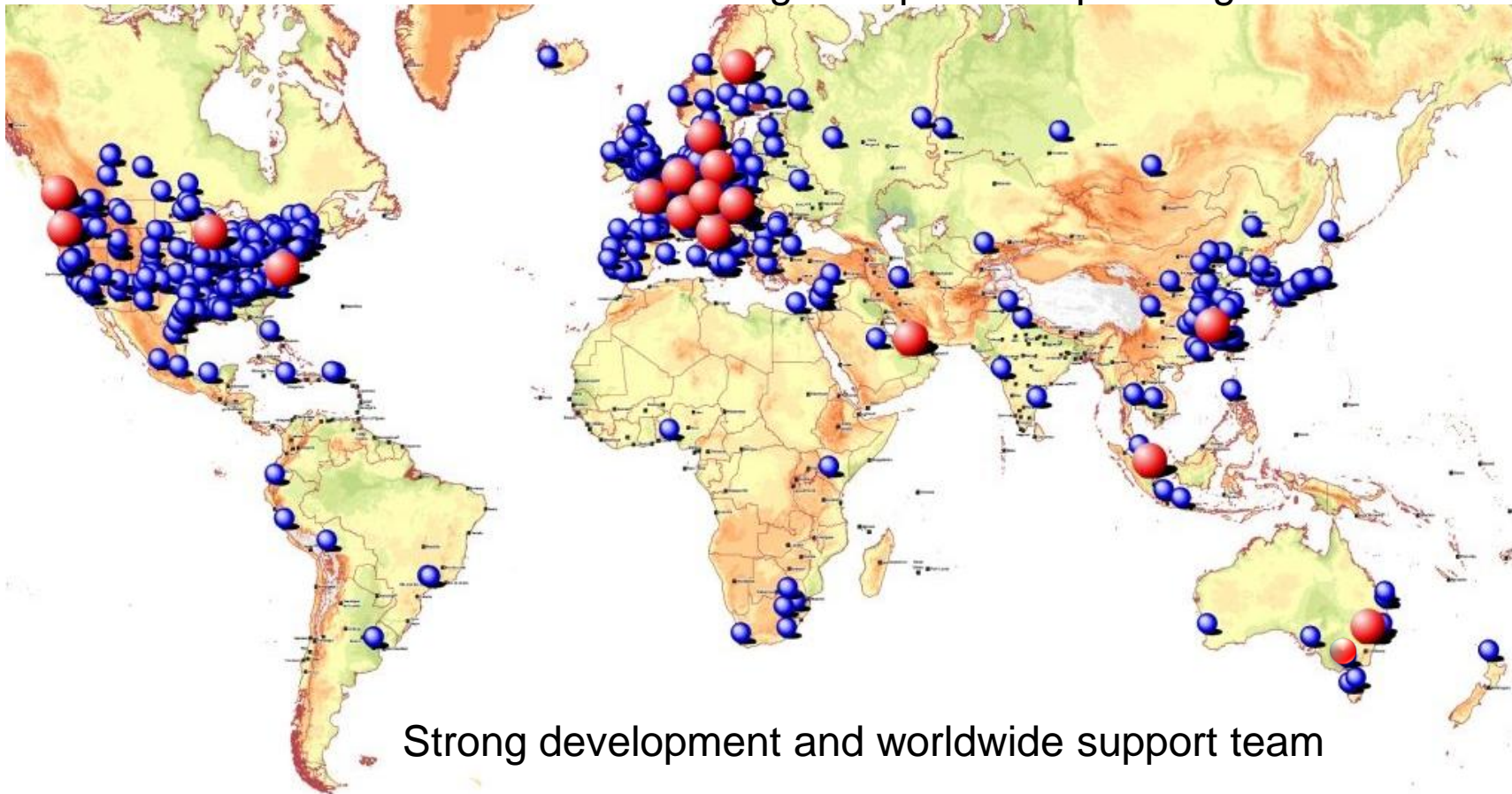
World-wide



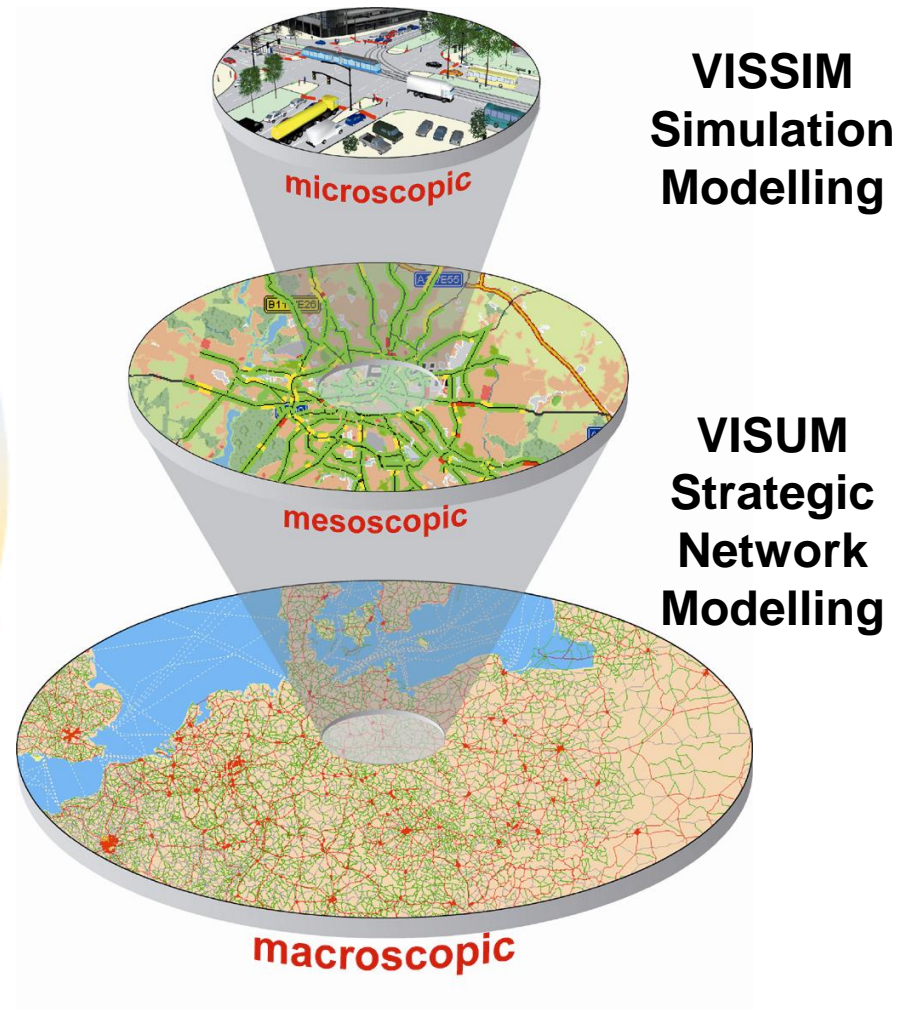
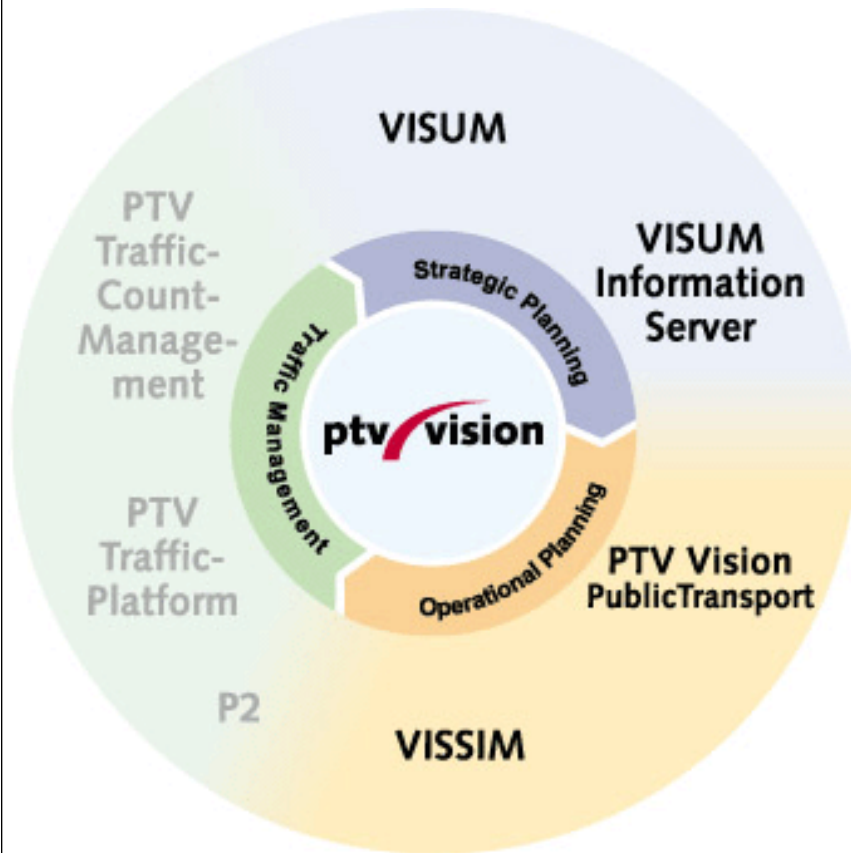
-  PTV Group
-  Partner

## PTV Vision: Sustainable Investment

- > With more than 2,000 clients and 7,000 users in over 90 countries PTV Vision has become the leading transportation planning software



# The Software Suite for the Transportation Professional



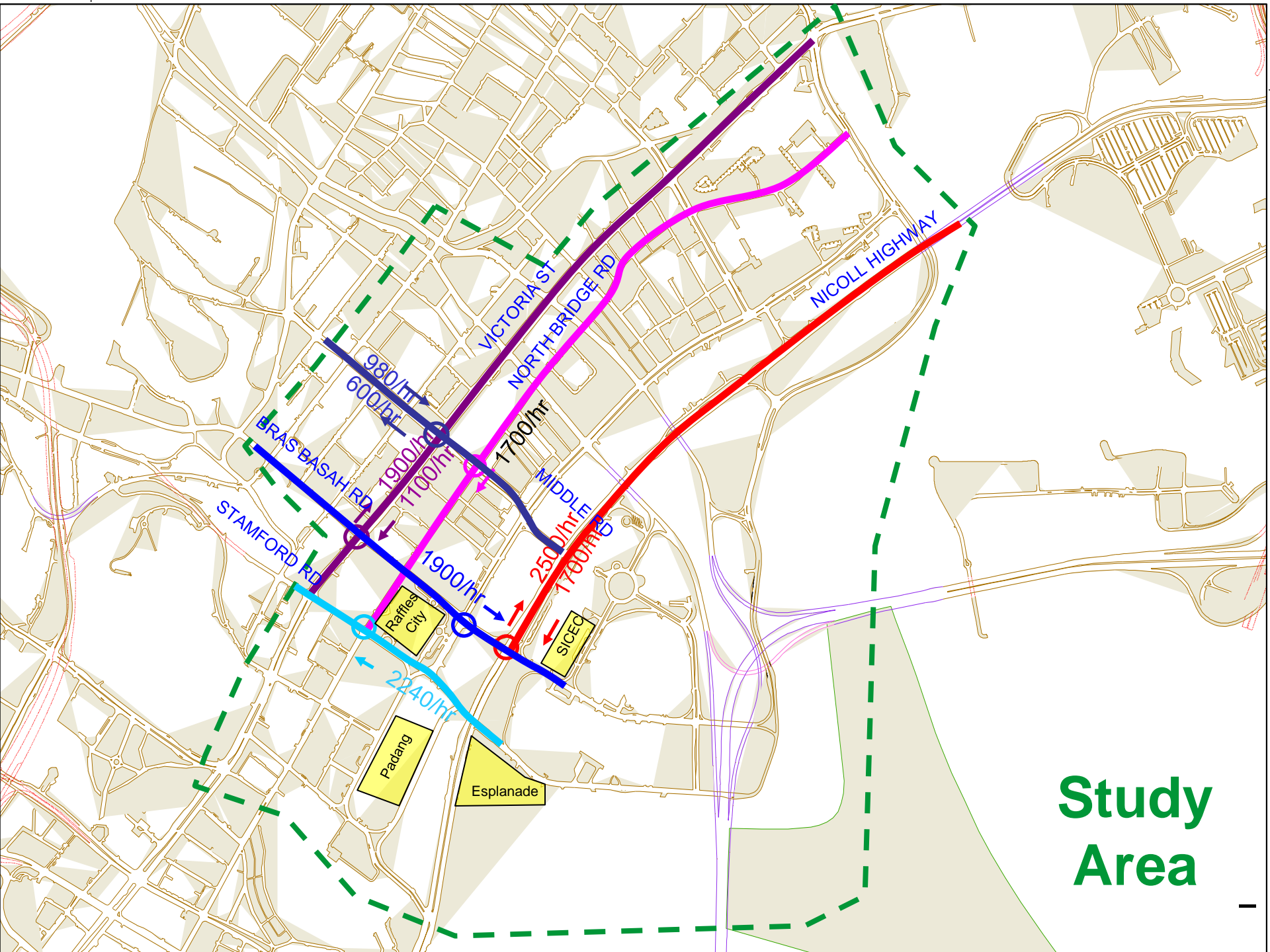
## Special Event Planning by PTV

- > 2005: FIFA Federations Cup (Germany)
- > 2006: FIFA World Cup (Germany)
  - > City Wide Traffic Management and Mitigation  
[www.vmzberlin.de](http://www.vmzberlin.de)
- > 2008: Singapore Grand Prix
- > 2009: Yas Marina Grand Prix (Abu Dhabi, UAE)
- > 2010: Winter Olympics (Vancouver, Canada)
  - > City Wide and Pedestrian Operations
- > 2010: FIFA World Cup (South Africa)
  - > Cape Town Stadium Design
- > 2012: European Football Tournament (Poland/ Ukraine)
  - > Transport Access, Network operations





# Singapore Suntec Area



**Study Area**

# Suntec Study Area



Intersections close together  
Locations with significant weaving



Heavy Pedestrian Volumes



# VISUM and VISSIM Model Development

## VISUM Model Development

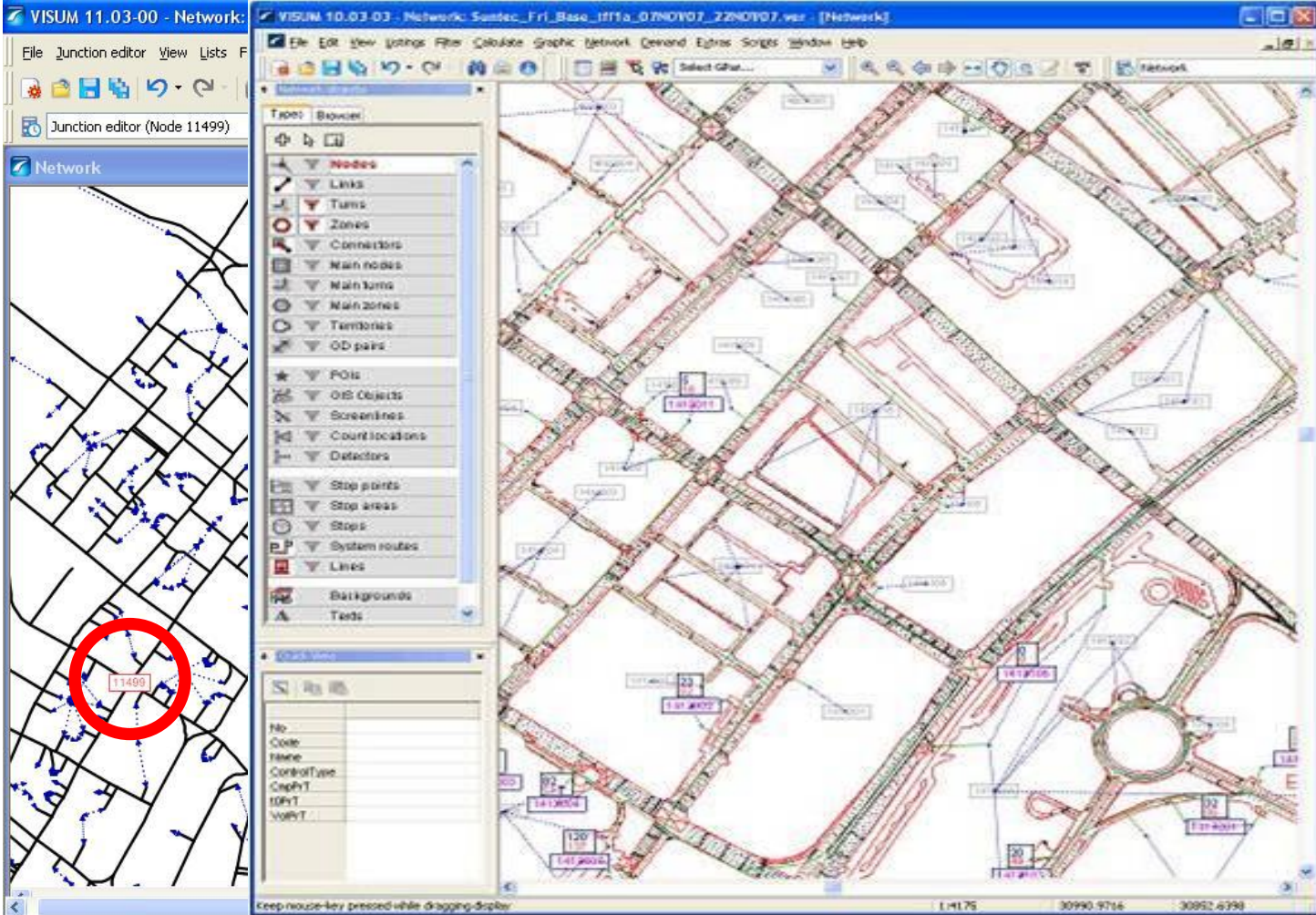
- > Develop VISUM model of land uses and transport system
- > Friday PM (18<sup>00</sup>-20<sup>00</sup>) and Saturday afternoon (12<sup>30</sup> to 14<sup>30</sup>) .

### Transport Demand

- > Derivation of 165 Zones within study area
- > Modes in network include:
  - > Bus, Car, Goods Vehicles, Motorcycle, Taxi, Pedestrians
- > Friday PM trip purposes include:
  - > Work to Home (some reverse)
  - > Leisure/Social trips to CBD, including markets
- > Acquisition of trip rates for travel zones
  - > hotels, high rise office, hospitals, markets, leisure centres etc
- > Cordon points used to identify external trips.
- > Trip distribution matched by number plate survey



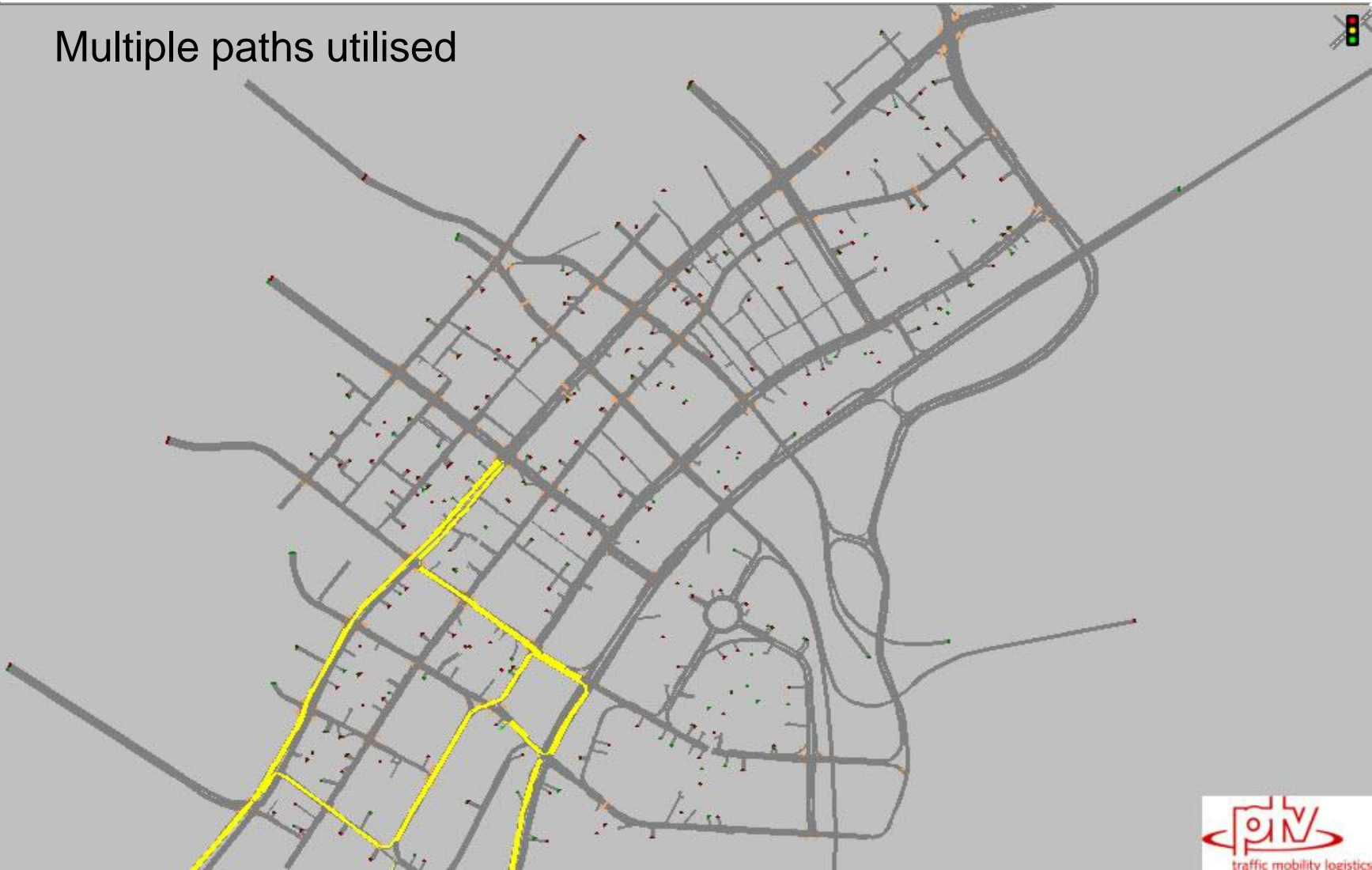
# VISUM Model Development



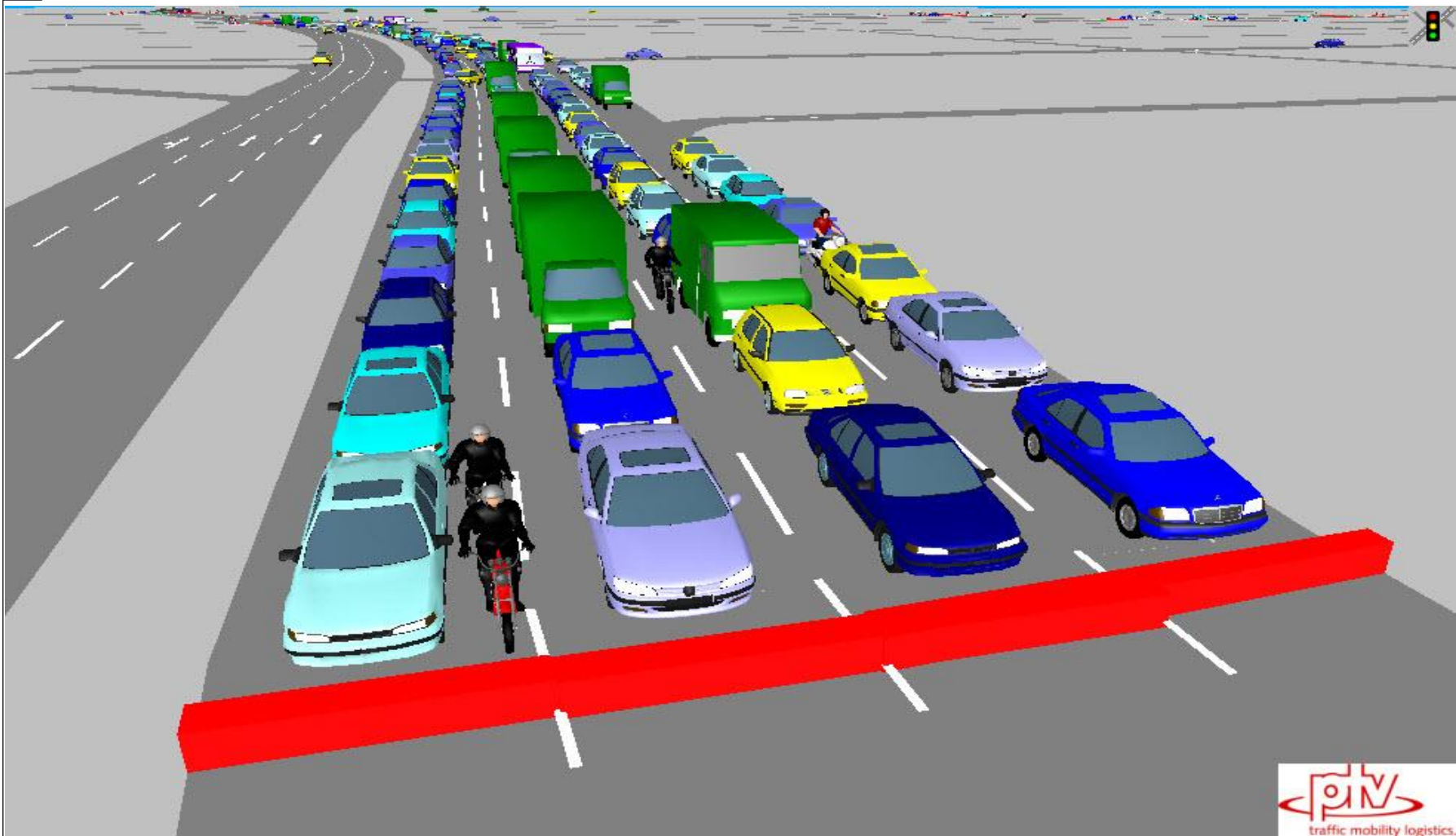
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# VISUM to VISSIM: Export/Import process

Multiple paths utilised

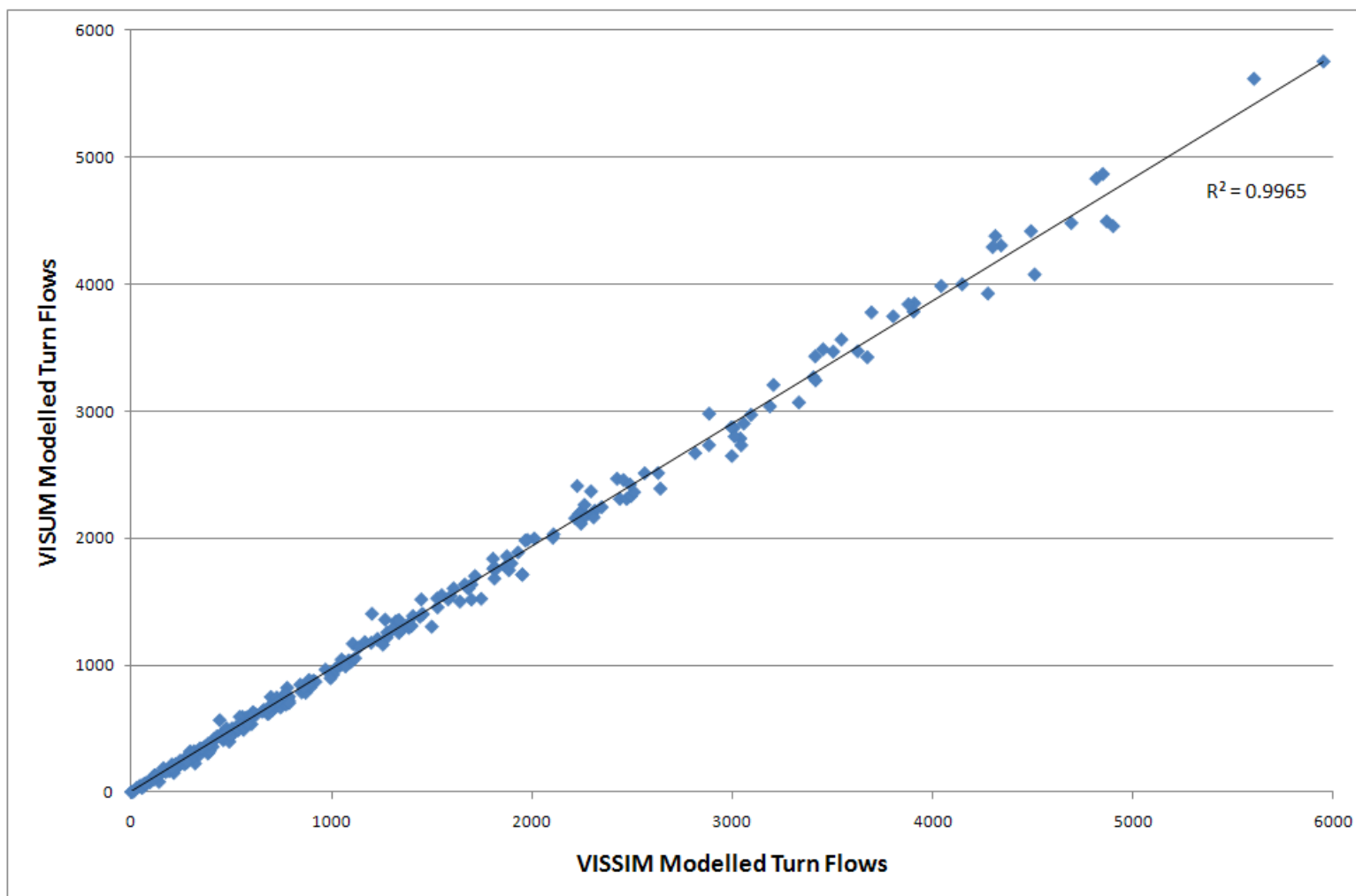


# Simulation Refinement





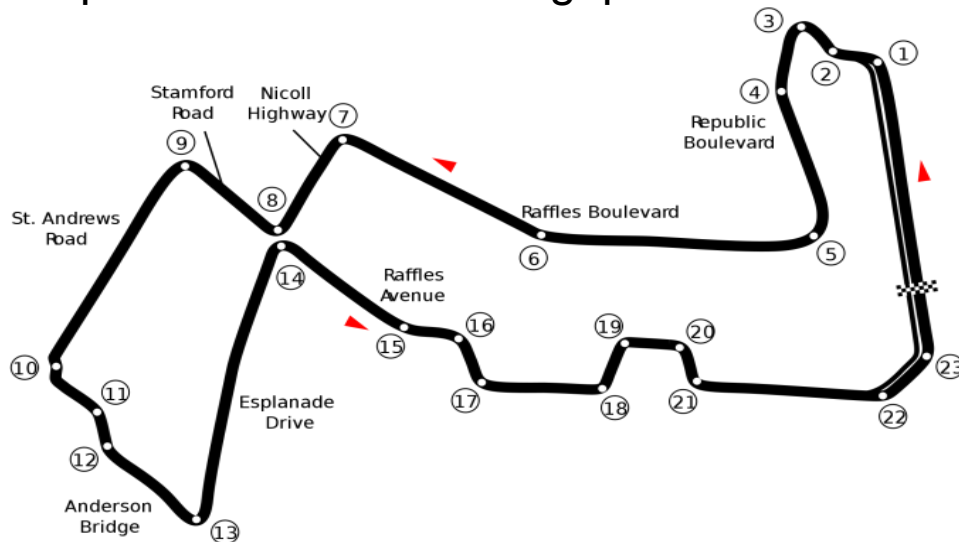
# Turn Flows Modelled: VISUM to VISSIM



# Special Event Planning

# Special Event Planning by PTV

- > Base model used to review proposed scenarios in northern CBD
- > Examine network consequences
  
- > Shorter term (special event) and medium term actions.
  1. Conversion of lane into taxi rank for Convention and Exhibition Centre
  2. Localised public transport operations and stop arrangement issues
  3. Transport plans for the initial Singapore Grand Prix (2008)

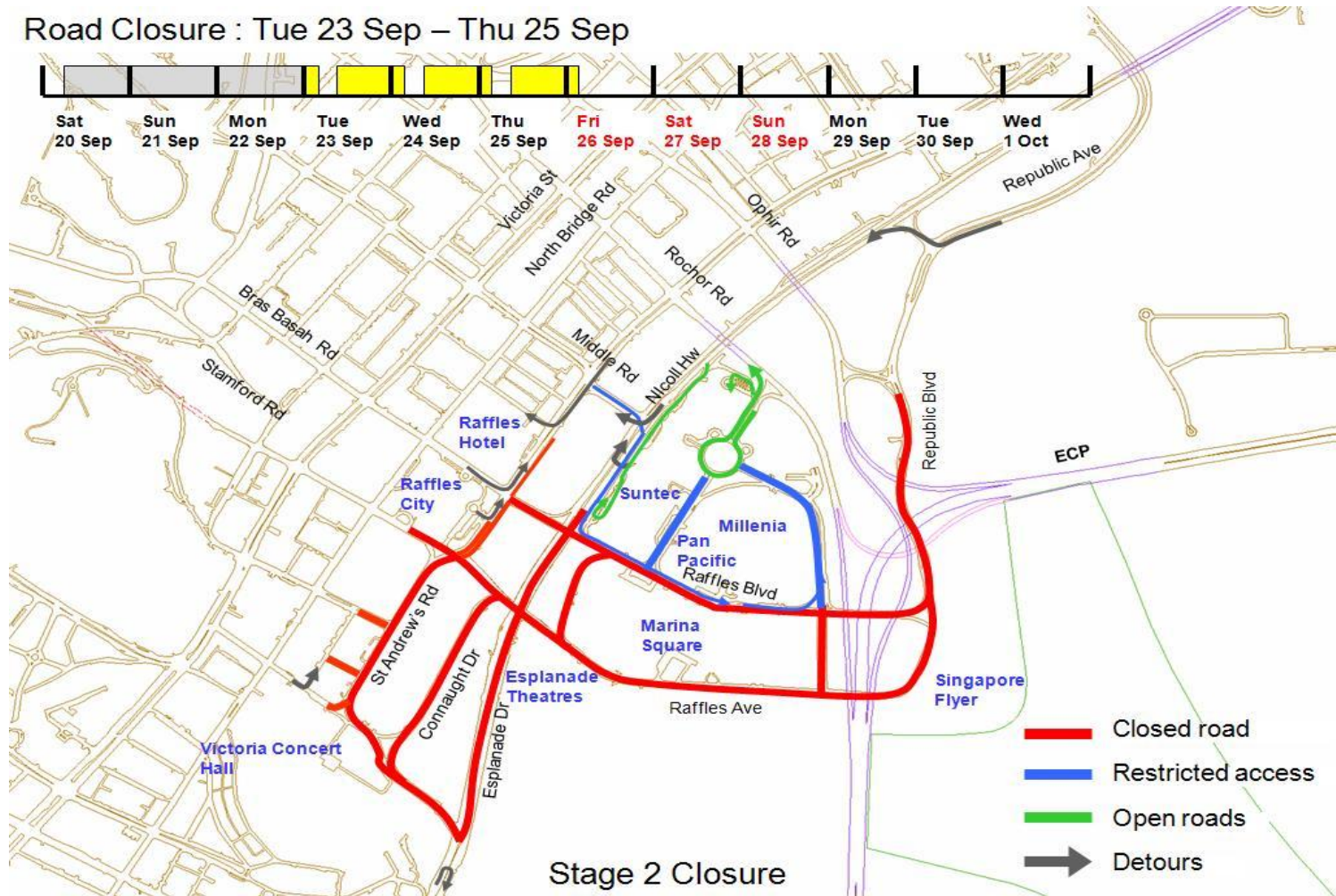


## Singapore Grand Prix (2008)

- > Management of road network in lead up and during Grand Prix
- > Use of ANM process to assess impacts and simulate conditions
- > Instantly produce results in VISUM
  - > Revisions to road network (link and/or turns)
- > More or less trips?
- > Reduction in trips by 15-20% across zones.
  - > Revisions with matrix editor
- > Two Stage Traffic Management scheme
  - > Introduction of detours (signage) (except event services)
  - > Application of route closures.
- > Review modelled conditions: Vehicle speeds, throughput volumes



# Special Event Planning by PTV



# Lessons Learnt

## Conclusion

- > Direct connections between VISUM and VISSIM allow for land use investigations to be simulated quickly
- > Allows organisations to quickly evaluate traffic management/ mitigation schemes
- > VISUM can quickly determine traffic assignment within network
- > Adaptive Network Model can maintain consistency between VISUM and VISSIM - at turn flow level
- > Some subtle refinements required in network
- > Directly model operational conditions within landscape with land use focus
- > Extraction of assigned paths into simulation saves significant time and resources
  
- > Approach works well for local investigations: councils, CBD's, town centres.
- > Same methodology works for **Special Event** planning and analysis

# PTV – Powering Transportation Visions

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