



# CAPABILITY STATEMENT

TRAFFIC & TRANSPORT CONSULTING



**TTS** GROUP

Total Traffic Solutions

# About Us

**TTS Group** is a leading specialist traffic and transport consulting firm that provides an integrated range of professional services throughout SE Asia

Our total traffic solutions cover the entire range of professional traffic engineering and transport planning elements and are specifically tailored to the development and infrastructure sectors.

TTS Group operates with a mission of "Where Solutions Meet Intelligence." This vision allows TTS Group's expertise to span a wide range of sectors, including cutting-edge AI-powered ITS analytics. We deliver innovative solutions for optimising traffic flow, enhancing safety, and improving overall efficiency.

## **PRACTICALITY • DIVERSITY • TECHNOLOGY**

Since our humble beginnings in early 2010 we have since been providing our total range of traffic solutions and professional services to both public and private sector clients including:

- Land & Property Developers
- Construction & Building Contractors
- Architects, Planners & Project Managers
- Multidisciplinary & Specialist Consultants
- Mining, Industrial & Freight Companies
- Federal & State Government Agencies
- Road & Public Transport Authorities
- Major Retail & Shopping Centres
- Schools & Universities

## **OUR CLIENTS COME FIRST ABOVE ALL**

TTS Group has an enviable project portfolio and range of expert capabilities tailored to the local industry and markets that we serve.

Our unique and highly specialised services are underpinned by the depth and breadth of experience offered by our professional staff – all of whom are essential to the quality of service our clients have grown to expect.

# Why Us?

We are different because:

- ✓ we respond immediately to client's needs and deliver before deadlines
- ✓ we develop a thorough understanding of specific requirements for each and every individual project
- ✓ we engineer practical and feasible solutions to complex transportation problems
- ✓ we are diversely involved in projects at all stages from inception planning to construction and even the operational stages
- ✓ we use the latest equipment and technology for traffic surveys and data collection processes
- ✓ we are professional traffic engineers with relevant training, experience and accreditation
- ✓ we have highly mobile staff able to travel to your project site or office with short notice
- ✓ we are an international firm and our staff bring invaluable global experience to every project

## **Our Guarantee**

Our services are guaranteed to meet exceptional levels of quality, quick deadlines and tight budgets regardless of the size or nature of your project.

We have established, implemented and maintain quality management systems based on ISO9001:2008. These systems ensure uniformity, consistency and excellence is always achieved within any deliverables produced by our firm.

# Our Services

## Traffic

### Traffic Engineering



Traffic Engineering is the core function of TTS Group. We provide professional engineering services which cover the planning, design, operation and analysis of traffic and transport systems. Our practical traffic engineering solutions and recommendations are based on solid professional experience in the local and international industry.

#### DEVELOPMENT PLANNING

- Traffic impact assessments
- Vehicle swept path simulation
- Car park and site access design
- Site traffic circulation assessment
- Pedestrian access and mobility assessments

#### TRAFFIC MANAGEMENT

- Traffic control and road diversion plans
- Incident management plans
- Local area traffic management
- Special events traffic planning and management

#### ROAD SAFETY

- Road safety audits
- Road safety evaluations
- Speed Limits reviews
- Crash investigation

#### TRAFFIC MODELLING

- Junction capacity modelling
- Interchange modelling
- Traffic simulation modelling
- Pedestrian simulation modelling

#### TRAFFIC DESIGN

- Road and intersection geometry
- Traffic signals
- Site access and car parks

## Transport

### Transport Planning



Our Transport Planning team brings together a range of specialist capabilities and expertise aimed at planning modern transport infrastructure and sustainable transport solutions. Our capabilities range from demand forecasting through to transport modelling, public transit and active transport.

#### PUBLIC TRANSPORT

- Passenger demand forecasting
- Transit facility planning and analysis
- Bus route planning and scheduling

#### TRANSPORT INFRASTRUCTURE

- Infrastructure feasibility studies
- Pedestrian and bicycle mobility planning
- Road network and hierarchy planning
- Tollway planning and road pricing

#### TRANSPORT MODELLING

- Strategic modelling
- Micro-simulation modelling
- Pedestrian mobility simulation modelling

#### TRANSPORT MASTERPLANNING

- Regional transport planning
- Local area traffic management
- Development masterplanning

#### TRANSPORT POLICY

- Policy review and development
- Parking management strategies
- Traffic management strategies
- Development contributions and structure plans

## Data

### Traffic Surveys



TTS Group has the unique advantage of applying advanced equipment and technology into various transport data collection and survey requirements. Our data and survey experience, combined with the traffic engineering foundations of the Group provides an unrivalled professional product for our clients.

#### TRAFFIC SURVEYS

- Junction turning movement surveys
- Link count surveys
- Pedestrian movements
- Travel time surveys
- Origin-destination surveys
- Vehicle classification surveys
- Vehicle occupancy surveys

#### PARKING SURVEYS

- Parking demand, duration and turnover surveys
- Parking overspill surveys
- Passenger drop off/pick-up survey

#### PUBLIC TRANSPORT SURVEYS

- Passenger demand surveys
- Arrival and departure time surveys
- Boarding and alighting surveys
- Passenger crowding surveys

#### BEHAVIOUR SURVEYS

- Origin-destination interviews
- Roadside interviews
- Car parking interviews
- Travel behavior and household questionnaires

#### TECHNOLOGY -ENABLED SURVEYS

- Video-assisted Traffic Surveys
- AI Traffic Counts & Speed Surveys
- Live Traffic Monitoring
- Noise-Level Surveys

# Our Services

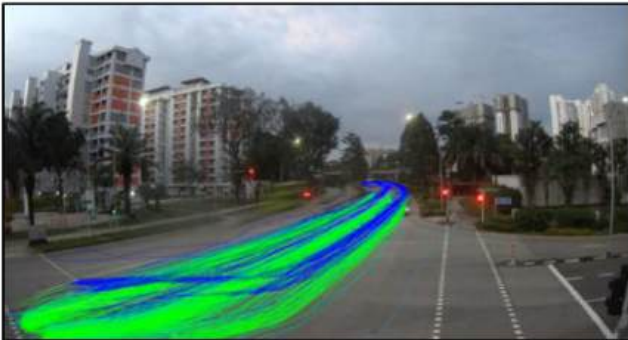
## Transport Analytics

Technology has been integral of how TTS Group conduct its data collection. From 2011, TTS has moved from conducting manual on-site surveys to processing video footage collecting from site as part of its video reduction process. Over the years, particularly since 2017, we have embarking on developing transport analytics through the usage of video analytic technology as part of our service offerings to our clients.

### CUSTOMISED 5-CLASS VEHICLE CLASSIFICATION MODEL

■ CAR ■ LGV ■ HGV ■ MC ■ BUS

■ BICYCLE ■ PERSON



Transport analytics consist of vehicle detection, classification and analysis that produces traffic data that is relevant for onward usage. TTS has developed its own vehicle classification model for its primary markets in order to have an optimised detection rate.

This model leverages on existing data collection work that TTS has done for its clients over the years, with consistent feeding of vehicle images into the model to ensure its relevance and accuracy. The model is also used with live traffic analytics, providing insights to incident traffic management on our roads.

## Transport Analytics

## Our Experience



### Land Transport Authority

#### Demand Aggregate Technology-Based Traffic Surveys

Since 2017, we have applied transport analytics into traffic surveys that we conduct in the term contract for the Land Transport Authority, Singapore. Some of the survey types covered using analytics include Classified Count Surveys, Queue Length, Dwelling Time and Speed Surveys. By leveraging on technology, in particular analytics, also helps to mitigate fluctuations in demand over the course of the entire year(s).

**“ Empower Solutions Through Intelligence. ” — TTS Group**

TTS Group has carried out a wide range of projects throughout South East Asia. At TTS Group no job is too big or too small and on a daily basis we are involved in many projects ranging from traffic surveys and traffic impact assessments to parking studies, site masterplanning, network modelling and design projects. Not only are we commonly engaged on high profile projects requiring high levels of specialist expertise such as court appeals, road safety and crash investigations, we also carry out technology transfer and training courses. We have showcased a small handful of projects below that aims to provide a brief overview of the breadth and depth of expertise we have and the range of services we provide.



## LAND TRANSPORT AUTHORITY DEMAND AGGREGATE TRAFFIC SURVEYS

This term contract over many years covers a diverse range of different traffic types and technologies used in delivering comprehensive data results for the Client. They generally comprises of but not limited to – Noise, Origin-Destination through License Plate, Train Platform, Parking Occupancy, Travel Time and Trip Generation Surveys. Most surveys are conducted on-demand throughout the entire year(s)



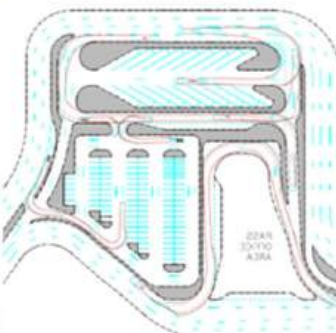
## EXPERIA EVENTS SINGAPORE AIRSHOWS 2016, 2018, 2020, 2022, 2024

This bi-annual aviation event, tucked in a corner of Changi East requires a reconfiguration of existing traffic scheme to allow traffic entering and exiting the event site in a smooth manner, as well as siting vehicle and person security check stations within the site vicinity, without having additional road infrastructure. In addition, assessment of the traffic impact of traffic generated by the event to the road network during event days. This is done through engagements with all stakeholders, adjustment of operations in nearby facilities and road closures to facilitate aircraft towing on a public road.



## TYCO FIRE & SECURITY VARIABLE MESSAGE SYSTEM FOR SENTOSA GATEWAY TUNNEL

This involves a tabletop exercise for different scenarios occurring at different parts of the Sentosa Gateway Tunnel, as well as its recommendations of LUS, VMS AID locations, Message Descriptions, Impact on Junction Locations, Organisation Task Analysis and Wayfinding elements.



## CHANGI AIRPORT GROUP CHANGI AIRFREIGHT CENTRE EXPANSION

This Traffic Engineering Study at Changi Airfreight Centre was commissioned to design the future Checkpoint to cater to future traffic volumes. Key aspects of the study included extensive traffic surveys around the vicinity of CAC checkpoint. Liaison with key stakeholders on the design aspects and requirements to produce a microsimulation model with different layouts and design Provided traffic engineering works such as carrying out swept path analysis to determine future turning radius etc.



### CHANGI AIRPORT GROUP FEASIBILITY STUDY FOR AIRPORT BUGGY STRATEGY AND POLICY DEVELOPMENT

The feasibility study aims to assess the demand for buggy mobility services and infrastructure at Changi Airport. It will recommend the development of a buggy mobility strategy and policy to support current and future airport needs. The study will focus on optimizing buggy services for specific terminals, establishing a sustainable buggy population, and ensuring safe and efficient services. It will also consider regulatory requirements to accommodate growing passenger traffic and will rely on primary survey data to inform its findings and proposals.



### LAND TRANSPORT AUTHORITY TUAS WEST MRT EXTENSION ROAD SAFETY REVIEW

This road safety review requires an audit of the road network of Tuas West Road and Gul Circle MRT Stations. This post-construction safety review (PCSR) encompasses of a site walk, a comprehensive understanding of the traffic schemes and road network, as well as pointing out potential safety hazards that may arise through the operational implementation of the traffic scheme.



### TELOK BLANGAH MASTERPLAN, TIA

This is a Keppel Club Masterplan Transport Impact Assessment (TIA) for the Housing & Development Board (HDB) Singapore project, which is situated within the Telok Blangah Planning Area. The project encompasses a combination of public housing and private housing plots, totalling over 6,000 dwelling units. In alignment with Singapore's commitment to becoming a more sustainable and car-lite city, this area has been gazetted as a car-lite precinct. The study examines various measures aimed at enhancing the public transport system, expanding the network of cycling paths, and integrating transportation with land-use planning. These initiatives collectively enhance connectivity for pedestrians and cyclists to access the planned public transport facilities. Furthermore, this TIA study evaluates the benefits of reducing car parking provisions to create additional space for public amenities and green spaces, all the while safeguarding the long-term viability of the road network.



### TIA AND DATA COLLECTION FOR NORTH SOUTH CORRIDOR (NSC)

The North-South Corridor (NSC) is a multi-modal transportation corridor that will enhance connectivity from the northern region of Singapore to the city centre. NSC aimed to relieve traffic along Singapore's north-south transportation axis and support new developments along the corridor, at Sembawang, Yishun, Ang Mo Kio, Toa Payoh, Novena and Rochor areas. TTS Group was engaged to undertake the Traffic Count Survey, development of Traffic Control Plan and perform a Microsimulation Study for part of NSC contracts.



### TRAFFIC DUE DILIGENCE STUDY FOR PROJECT HANOI - HAIPHONG (HNHP) EXPRESSWAY

The general scope of services is to set up an investment grade model to provide traffic and revenue forecast for proposed HNHP expressway in the north eastern part of Vietnam. The activities include building the network from scratch and modelling using the AIMSUN software. Modelling included calibration and validation for base forecast and sensitivity test for future forecast scenario. TTS Group had conducted large-scale traffic volume survey and O-D interviews in parallel with the secondary data collection to understand the current traffic conditions in the study area.



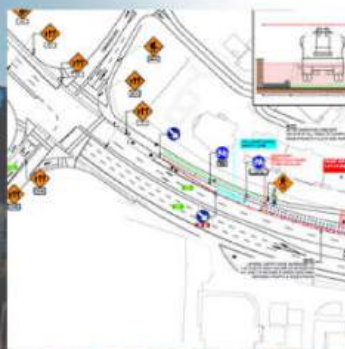
### TECHNICAL ASSISTANCE FOR THE NORTH-SOUTH EXPRESSWAY IN THE EAST CONSTRUCTION PROJECT

The purpose of this project is to ascertain the project's viability and estimate if any government support is needed to support the Project. A feasibility study on this project was previously prepared by a Vietnamese technical engineering firm. After reviewing the Feasibility Study, TTS Group prepared a technical analysis including Traffic Analysis report and Traffic Forecasting report with a high-level view of the project's technical and financial feasibility.



### HANOI BUS RAPID TRANSIT PROJECT – TECHNICAL SUPPORT REPORT FOR BRT OPERATIONS

Hanoi Urban Transport Development's Project Management Unit (PMU) required an individual consultant specialist to be appointed in order that the Hanoi BRT's operational and service planning feasibility study could be developed. TTS Group carried out traffic surveys at 32 intersections along the BRT route, including traffic turning movement surveys and traffic signal survey as well as capturing the junction configuration on site. In addition, transport modelling was performed to understand impacts of BRT on intersections and the various scenarios in implementing the BRT scheme.



### O'BRIEN ROAD AND POLZIN ROAD TRAFFIC CONTROL PLANS

The development of traffic control and construction management plans has formed a considerable part of our ongoing involvement in infrastructure and development in the Toowoomba region. We have prepared a range of complex traffic control plans for important public works and infrastructure upgrades along O'Brien Road and Polzin Road in the Highfields region.



### YANGON ELEVATED EXPRESSWAY (YEX)

This is a review and forecast demand study for YEX Phase 1. The main objective of this study is to estimate the expected toll revenue of the expressway in order to project the trend in the future on the current road network and future road development plans to which the government is committed as its policy. Prior to the traffic demand forecast, traffic volume survey and travel time survey were conducted in parallel with the secondary data collection to understand the current traffic conditions in the target area and use the results as basic data for the forecast.



### YANGON CENTRAL RAILWAY STATION AREA, TIA

This projects comprises of an analysis of increased pedestrian and vehicular traffic in the area, potential disruptions to existing transportation routes, and the potential for increased congestion during construction and operation. Following that, we developed an integrated transportation plan that addresses the increased demand for transportation services in the area, which include expanding public transit options, improving pedestrian infrastructure, and optimizing road networks to accommodate the expected changes in traffic patterns. Construction of mixed-use development in the vicinity of the station were recommended to prioritize sustainable transportation solutions to reduce the reliance on private vehicles and promote eco-friendly alternatives.



### KANTHARYAR CONSORTIUM TOWER, TIA

This project is to evaluate the potential transport impact of the Kantharyar Consortium Tower on the existing road network. A series of traffic surveys were conducted, including junction count surveys, traffic phasing observations, and queue length surveys. These surveys allowed us to gain a deep understanding of how the tower's development might influence traffic patterns and congestion in the vicinity. Based on the gathered data, our team then went on to devise effective strategies and recommendations aimed at mitigating any adverse impacts on transportation in the area.



### HAGL MYANMAR CENTRAL, TIA

This is a series of data collection surveys and to conduct a thorough review of the carpark design and internal circulation. This allowed us to provide a well-rounded set of recommendations that not only address external traffic concerns and also address any negative impact that the building may have on the surrounding transport network

# Capability Statement

## Track Records

TTS Group specializes in providing comprehensive services such as Transport Impact Assessments, Project Safety Reviews, and Traffic Control Plans. Our dedicated team of experts is committed to delivering exceptional results, ensuring safety, and optimizing traffic flow for successful project completion.

Project	Client
Transport Impact Assessment (Over 100 projects)	Land Transport Authority, The Housing & Development Board, Private Sector.
Project Safety Review (Over 50 projects)	Land Transport Authority, The Housing & Development Board, Private Sector.
Traffic Control Plan (Over 100 projects)	Land Transport Authority, The Housing & Development Board, Private Sector.

Project Name	Client
LTA PL222A - Term Contract for Survey Services (2020 - 2023)	Land Transport Authority, Singapore
LTA RP257 - Conduct Manual Traffic Surveys (2013 - 2014)	Land Transport Authority, Singapore
LTA TR326B - Conducting Traffic Surveys (2019 - 2021)	Land Transport Authority, Singapore
LTA PL192B - Term Contract for Survey Services (2017 - 2020)	Land Transport Authority, Singapore
Singapore Airshow 2016, 2018, 2020, 2022, 2024 - Traffic Survey, Traffic Plan, Traffic Impact Assessment and Post-Implementation Review	Experia Events Pte Ltd
LTA PL152 - Traffic & Bus Data Collection (2011 - 2012)	Land Transport Authority, Singapore
LTA PL172 - Provision of Survey (2015 - 2018)	Land Transport Authority, Singapore
URA T/16/059 2-year Traffic Survey Term Contract	Urban Redevelopment Authority

# Capability Statement

## Track Records

Project Name	Client
Telok Blangah Waterfront District	Housing & Development Board, Singapore
LTA DE120 - Widening of Tampines Ave 10 between Tampines Ave 5 & TPE (Traffic Survey, Traffic Plan, Traffic Study)	Samwoh Corporation Pte Ltd
Data Collection at Loyang Avenue (LTA DE160)	Hwa Seng Builders Pte Ltd
LTA DE123- Widening of Tampines Road between Tampines Ave 10 and KPE (Traffic Plans)	Eng Lam Contractors Pte Ltd
Suntec City Traffic Study For F1 Race Event	APM/MCST
Penjuru Traffic Management	Vopak Terminals
Visitorship Counting Services of Gillman Barracks 2017	National Arts Council
Data Collection for Foreign Worker Visitorship 2016/2017	Jurong Town Corporation
Data Collection at KJE / Bricklands Road	Chye Joo Construction Pte Ltd
Visitorship Counting Services of Gillman Barracks 2018	National Arts Council
LTA ER529A - Construction of Senja Road / KJE Interchange (Traffic Survey, Traffic Plan, Traffic Study)	Quek & Quek Civil Engineering Pte Ltd
Visitorship Counting Services for Light 2 Night Festival 2018	National Gallery Singapore
Changi Airfreight Centre Customs Checkpoint Traffic Study	Changi Airport Group
Visitorship Counting Services for ABC Sites	Public Utilities Board
Changi Airport Logistics Park of Singapore (ALPS) Transport Study	Jurong Town Corporation
Data Collection at Punggol Central / TPE (LTA ER519A)	Hwa Seng Builders Pte Ltd
CAG Mode Share Study	Changi Airport Group
Tanglin Village	Singapore Land Authority
LTA DE159 - Roadworks at Lim Chu Kang (Traffic Survey, Traffic Plan, Traffic Study)	Samwoh Corporation Pte Ltd
Visitorship Counting Services for Malay Heritage Centre 2017/2018	National Heritage Board

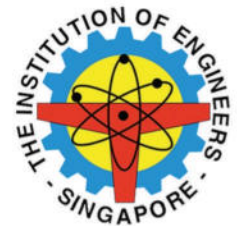
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## Track Records

Project Name	Client
Singapore General Hospital Traffic Study	SKM Consultants Singapore
LTA SRI701 - PSR for Upgrading for Bt Timah Rd / Jln Anak Bt ER480A	Land Transport Authority, Singapore
Wenya Industrial Estate Traffic Impact Assessment	Jurong Town Corporation
Data Collection for Existing / Proposed Petrol Kiosks	CBRE / Exxonmobil
LTA CQ1604 - PSR for Woodlands Rd	Land Transport Authority, Singapore
LTA OT/11/75 - Data Collection for Transit System	Land Transport Authority, Singapore
Light Transport Mode Study of Changi Airport	Changi Airport Group
A&A to Conserved State Courts, Family Justice Courts	Lum Chang Building Contractors Pte Ltd
Vehicular Height Study around Changi Airport	Changi Airport Group
LTA RD299 & RD300 - DDSR for 2 Bus Depot	Tiong Seng Contractors Pte Ltd
Traffic Due Diligence Study for Project Hanoi-Haiphong Expressway in Vietnam	MOT
Technical Assistance for the North-South expressway in the East Construction project in Vietnam	Ernst & Young
Hanoi Bus Rapid Transit Project - Technical Support Report for BRT operations	Ernst & Young
Traffic Surveys & Microsimulation along North South Corridor	Samsung C&T Corporation Arup Singapore Acender Technology
Data Collection for Existing / Proposed Petrol Kiosks	CBRE / Exxonmobil
Sentosa Gateway Tunnel Incident Management	Tyco Fire & Security
Singapore Night Festival 2017 & 2018	National Heritage Board

# Achievements & Qualifications

Asio.  
Business Outlook **TOP 10**  
TRAFFIC AND TRANSPORTATION  
CONSULTANTS IN ASIA - 2022



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# TTS GROUP

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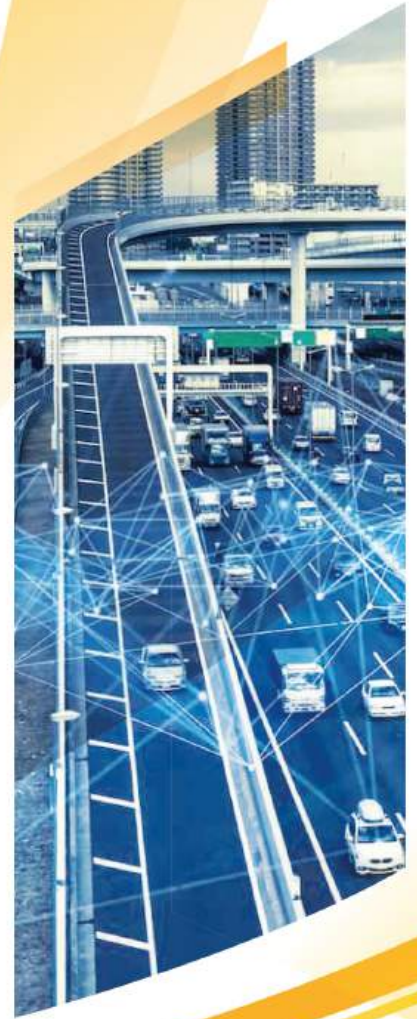
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# TOTAL TRAFFIC SOLUTIONS

# TTS GROUP

Total Traffic Solutions



**TRANSPORT  
PLANNING**



**TRAFFIC  
ENGINEERING**



**DATA  
COLLECTION**



**TRANSPORT  
ANALYTICS**

TTS Group is a leading specialist for traffic and transport engineering group. Our head office is in Singapore with a branch office in Hanoi, Vietnam and we also have representative offices in Myanmar and Australia.

Over the last decade, TTS Group has grown to become South East Asia's leading specialist for traffic and transport consulting firm that specializes in various aspects of transport planning, traffic engineering, data collection and market research.