Proven Urban Traffic Management Solutions

The Smart Junction forms part of ST Engineering’s comprehensive suite of Urban Traffic Management solutions that has a proven track record of managing more than 50,000km of roads worldwide.
Smart Junction Management System

The Smart Junction Management System (Smart Junction) is an advanced urban traffic signal control solution that optimises the efficiency of urban road networks. It supports a new generation of advanced traffic management solutions that improves the travel experiences of motorists and commuters.

Why Smart Junction

Conventionally, the set up and configuration of traffic signal control is complex and time-consuming. Smart Junction simplifies traffic control with operator-friendly interfaces, and leverages advanced Artificial Intelligence (AI) and big data analytics to automate labour-intensive processes and minimise manual interventions.

Self-Learning

The Smart Junction is equipped with self-learning capability. It leverages AI and big data analysis to learn from historical traffic flow pattern and incorporates real-time data to achieve adaptive and optimum traffic control.

Predictive and Pre-emptive

Accumulate learning experiences from historical and real-time traffic data to provide a predictive and pre-emptive signal control solution.

Traffic Pattern Recognition and Real-time Adaptation

Automatically recognises traffic pattern changes by using big data analytics and self-adapt to these changes, unlike conventional time-based traffic signal control. Key benefits:

- Optimise signal timing and strategy based on real-time traffic pattern
- Enable self-adaptive response to unplanned events and incidents

Scalability

Adopt distributed control to enable easy expansion and reduction of junction nodes with minimum effort. If there is any change in the junction network topology, only the affected neighbouring junctions will be notified of the new junction links.

Flexible Sensors Input

Interface with various types of sensors for real-time adaptation. It works with conventional loops and other detection technologies such as video analytics, radar or individual vehicle detection and identification through Vehicle-to-Everything (V2X) communications.

Future-proof

Support V2X communications to facilitate autonomous vehicle, truck platooning, and other future mobility needs.

What is Smart Junction

The Smart Junction comprises three key components:

1. Central Management System
   Monitor and manage all traffic controllers at each junction within a city’s road network

2. Traffic Control Algorithm
   Leverage AI and big data analytics to provide traffic signal timing and strategy for each traffic signal controller. It coordinates timing and strategy of a network of controllers to achieve global optimisation and strategic coordinated control (e.g. corridor green-wave and priority-of-way for emergency vehicles)

3. Traffic Controllers
   Manage and control traffic signal at each traffic intersection, and communicate with the Central Management System to coordinate operation with other traffic controllers in the vicinity

Who will Benefit

Transport Authority

- Improve traffic intersection efficiency: reduce congestion, fuel consumption and carbon emission by minimising start/stop at intersections
- Reduce manpower: use AI-based automation to minimise labour-intensive processes such as data collection for traffic modelling, setup and configuration of traffic signal controllers

Public Transport Providers, Drivers and Commuters

- Public Transport Priority at intersections to provide smoother journey with minimum delay
- Better travel experience and shorter travel time for commuters and drivers

Emergency and Autonomous Vehicle (AV) Fleets

- Emergency Fleet Priority (e.g. ambulance) - minimise stops at intersections
- AV Priority - enhance signal priority for AVs to improve safety and mobility
- Vehicle Platooning - facilitate intersection crossing for smooth vehicle platooning