



TSI SOLUTIONS,
AI AND INTELLIGENT DATA-DRIVEN

TSI SOLUTIONS : INTELLIGENT, DATA DRIVEN SOLUTIONS

TSI TECH is a Singapore home-grown engineering company specialising in innovative solutions and services in the security and surveillance sectors.

Formed in 2004 and we have grown to be one of the leading solution provider for intelligent security solutions and mission-critical information systems. We offers our customers with advanced and integrated key functions in the critical information loop, from Connecting (transmission and distribution), Sensing (processing) and Responding (command and control systems, decision-support and operational analysis).

We provide solutions for a wide variety of markets, enabling homeland security and defence-industry developments to also benefit from the technology and knowledge transfer that result in a more extensive and robust offering. Our activities are oriented to engineering, software development, as well as turnkey systems integration and maintenance to cover the entire life cycle of systems in the following areas:



VANTAGE™
Intelligent Traffic
Information System



MOVIS™
Mobile Video
Surveillance



VIGILANCE™
Portable Location and
Tracking Intelligence



NUCELON™
Command and Control
Information Systems (C2IS)

AI + BIG DATA = REVOLUTIONISING TRAFFIC MANAGEMENT, SAFETY, LAW ENFORCEMENT, AND MORE

TSI's expertise primary lies in the development and delivery of smart city solutions, with a special focus on seamlessly integrating physical hardware, AI-empowered software, and cutting-edge information and communication technology, including 4G/5G, to enhance the efficiency and safety of the country.



Intelligent transport and traffic management solutions powered by AI and Big Data for the ultimate in road safety is among our key specialties.



TSI's comprehensive smart and safe city solutions take advantage of the most recent technological advancements to meet the diverse needs of modern urban environments.



Our commitment is focused on providing tangible benefits, increasing efficiency, and ultimately contributing to a better quality of life.

CASE STUDY – SUCCESSFUL IMPLEMENTATION ACROSS 3 REGIONS

Our products have been successfully implemented in Ethiopia, Singapore and the UAE;

In Abu Dhabi, we completed multiple 'Smart and Safe' transportation projects, with over 1,000 ANPR cameras installed along with integrated high-speed radar deployment. Adoption was robust despite the high temperatures and generally dusty environment.

Many traffic violations were detected, where speeding vehicles were imposed with fines, thus, greatly reducing cases of over-speeding and road incidents.



Additionally, over 7000 taxi and buses were installed with our MDVR system (MOVIS) to protect not only the passengers but also the drivers.

Our border security and CCTV project in Ethiopia through the suite of public safety applications and software, greatly reduced instances of border rules violation and illegal immigration, while also keeping the general public safer from unwanted incidents.

In Singapore, we successfully implemented our Asset Tracking and Command and Control System (C2) through Vigilance, to keep company personnel and mobile assets safer, providing unmatched security and intel, and ultimately, ensuring complete safety and security of the mobile asset.

SYSTEM OVERVIEW

Our smart and safe city solutions have been successfully deployed to address a range of requirements:



Intelligent Traffic Management

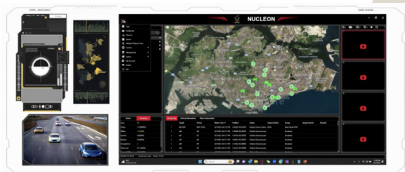
Optimization of urban mobility by implementing intelligent Traffic Management Systems, helping to reduce congestion, improving traffic flow, and enhancing overall transportation efficiency.



Vehicle, Building, and Critical Infrastructure

Tracking and Protection:

Tracking, protection, and surveillance of vehicles, buildings, and critical infrastructure, aiding in enhancing security measures and minimizing risks.



Secured Communications:

Implementation of secure communication systems as a priority, ensuring that data and information exchange within the smart city ecosystem are protected from unauthorized access and breaches at all times.



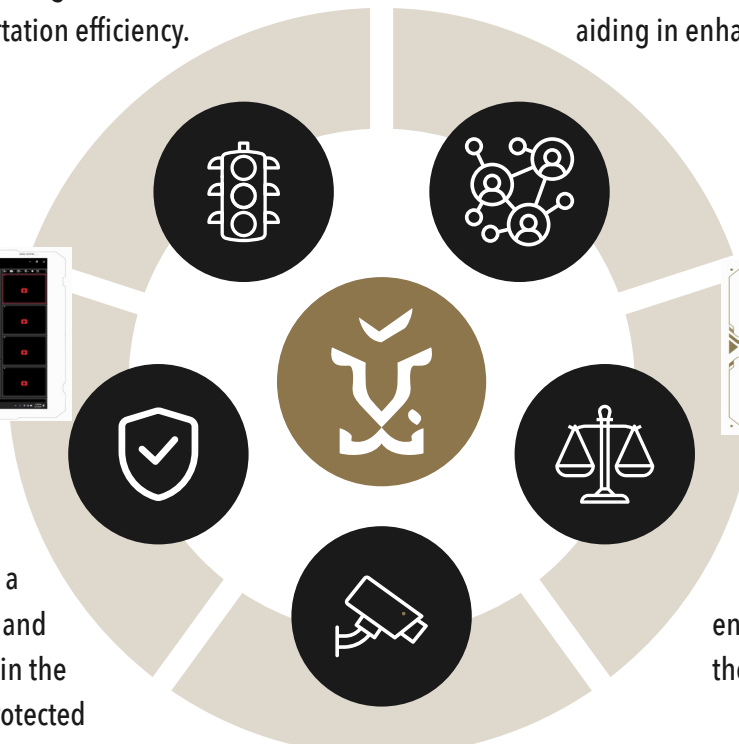
Law Enforcement:

Our solutions play a crucial role in supporting law enforcement efforts. This includes the deployment of technology for crime prevention, incident response, and overall public safety.



Border Security and CCTV Surveillance:

TSI uses CCTV and automated checks to secure restricted areas. They balance security with daily operations, ensuring fast and efficient movement of people and vehicles.



NUCLEON C2M PLATFORM

NUCLEON: Empowering Public Safety, One Agency at a Time.

Revolutionize your command and control. NUCLEON is a suite of advanced applications designed to empower first responders and safeguard communities.

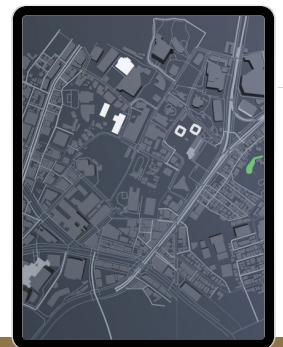
Built for Flexibility. We offer a wide range of pre-configured solutions that can be seamlessly customized to your agency's specific needs. No one-size-fits-all here.

Peace of Mind. Guaranteed. NUCLEON prioritizes reliability, ensuring smooth operation when every second counts. This translates to peace of mind for both first responders and the communities they serve.

Powering You with Progress. NUCLEON seamlessly integrates cutting-edge technology with TSI's years of expertise, creating a powerful platform for success.

Your Unique Needs, Our Tailored Solution. Our dedicated team translates your operational requirements into bespoke technical modules. NUCLEON perfectly aligns with your agency, optimizing operations and empowering your first responders.

Contact us today and let NUCLEON be the backbone of your public safety success.



NUCLEON™ Map: Supports all open map and proprietary map standards with unique view options, route planning, and map distance & area measurement.

NUCLEON™ Reports: Detailed reports on target location, route, operations, and customised reports with additional details.

NUCLEON™ Secured Messaging: Effective and efficient communication of data via video and voice call, text messaging, and file sharing.

NUCLEON™ Playback: Detailed video feeds on single or multiple targets with audio and live location of targets. Playable on standard video playback software.

NUCLEON™ Alerts: Provides device status along with geo-fencing capabilities, motion detection and speeding/tampering alerts.

NUCLEON™ Admin: Multiple administrative functions including device and account type management, role privilege management and live updates for front-end devices.



MOVIS

Mobile Vehicle Video Surveillance (MOVIS) is an Intelligent Mobile Video Monitoring system vital to government agencies seeking to improve homeland surveillance infrastructure, so as to best protect their critical assets and ensure public security.

The MOVIS™ Security Suite offers a comprehensive intelligent systems to enable effective situational awareness.

Innovative features like enhanced mobile video monitoring capabilities and real-time data analysis enables the system to provide a state-of-the-art suite of C2 applications for complete Command and Control.

MOVIS™ Drive provides continuous high-def streaming via 4G/LTE networks; designed for maximum portability to support rapid deployment.



MOVIS™ Monitor offers enhanced tracking capabilities which ensure optimal surveillance of vital assets and key installations.

MOVIS™ SenseMake is backed by Intelligent data analysis to process real-time location, sensor and video data to achieve proactive command and control.

MOVIS™ Action facilitates effective communication for prompt response and dispatch during a national crisis.

MOVIS™ Maestro enables complete coordination of the forward command and field units with the command centre.

PHOENIX

PHOENIX™ is a Personal Mobile Video Surveillance system that utilises intelligent mobile streaming and asset tracking, helping law enforcement agencies improve situational awareness, gather evidence, deter crimes, and induce better practices among law enforcement officers.

The PHOENIX™ body-worn Video Surveillance Security Suite includes:

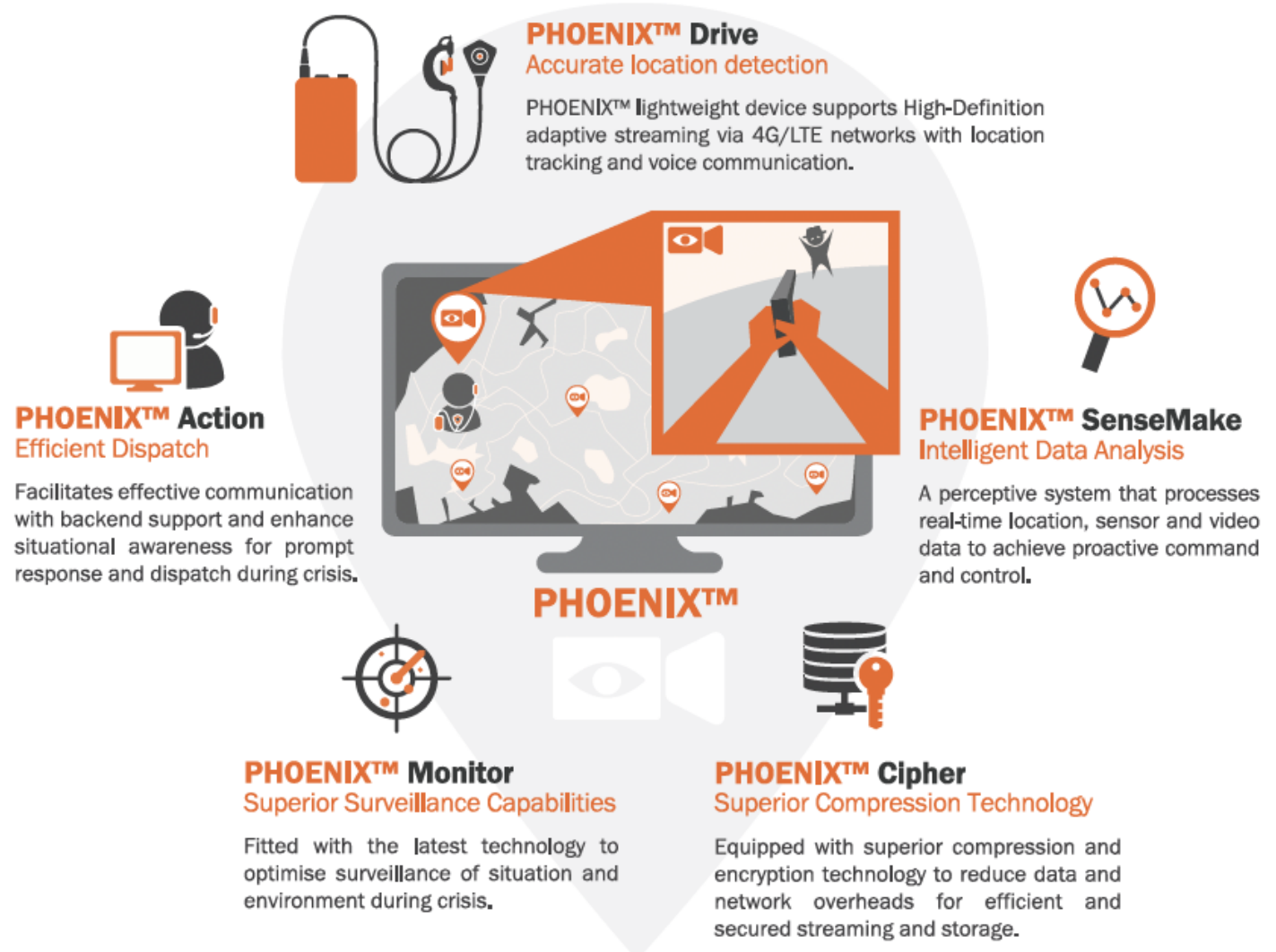
PHOENIX™ Drive supports HD adaptive streaming via 4G/LTE for accurate location detection.

PHOENIX™ Action facilitates effective communication and efficient dispatch through backend support for prompt crisis response and management.

PHOENIX™ SenseMake includes intelligent data analysis to process real-time location, sensor and video data for proactive command and control.

PHOENIX™ Monitor, fitted with the latest surveillance technology, offers superior surveillance capabilities.

PHOENIX™ Cipher is an innovative compression and encryption technology to help reduce data and network overheads for more efficient and secure streaming as well as storage.



VANTAGE

VANTAGE™, our Intelligent Traffic Information System, is the perfect solution for enhanced public road safety and law enforcement.

The comprehensive VANTAGE™ Security Suite can identify unique vehicle number plates, generating critical traffic stats to help government agencies monitor, maintain, and manage traffic as well as road development.

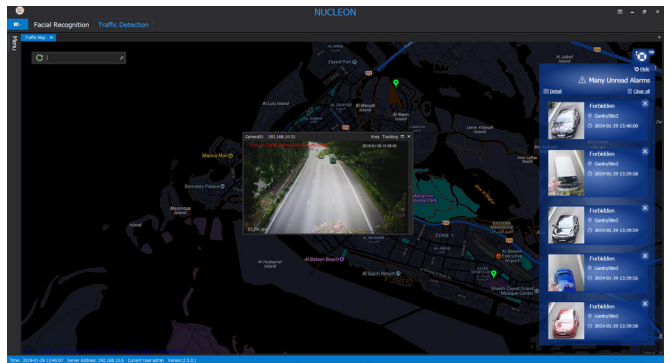
VANTAGE™ Drive features a self-contained system with an integrated Automatic Number Plate Recognition (ANPR) system which can accurately capture vehicle number plates up to speeds of 250 km/h.

VANTAGE™ Track creates black/white lists to intelligently track the movement of suspicious vehicles.

VANTAGE™ Control contains a host of automated systems to control traffic lights and monitor traffic violations for smoother flow and safer roads.

VANTAGE™ Connect enables VANTAGE™ devices and software to seamlessly connect with existing traffic surveillance equipment for control through a single app-based platform.

VANTAGE™ Real-Time enables traffic personnel to zoom in on critical sites and view detailed live data for real-time traffic monitoring.



VIGILANCE

VIGILANCE™ is a Portable Location and Tracking Intelligence system designed for public safety and mobile asset tracking, utilizing international GPRS/GSM networks to determine and report on any mobile asset's location with unparalleled accuracy.

The VIGILANCE™ Security Suite can be fully customized to meet the specific security needs for both personnel and vehicle tracking.

VIGILANCE™ Drive supports superior location tracking with a per second accuracy of up to 10m and offers optional data encryption.

VIGILANCE™ Secure enables front-end VIGILANCE™ devices to be integrated with multiple safety features such as vehicle immobilization, motionless alerts, SOS functionality, and more.

VIGILANCE™ GeoFence contains customizable tracking rules to ensure tracked assets remain within their assigned locations/designated routes.

VIGILANCE™ Maestro is an integrated C2 to enable coordination of forward command and field units with the command centre.

VIGILANCE™ SenseMake utilizes intelligent data analysis to process real-time location and sensor data to enable proactive command and control.



4G RADAR ADAS

4G radar ADAS is an advanced 77Ghz mmWave radar solution, a contactless sensing technology for detecting both stationary and moving objects, where the range, velocity and angle of such objects is relayed through software.

It's the perfect solution for operating in challenging environments; e.g. in complete darkness, extremely bright lighting conditions, dusty, rainy, and snowy weather, etc.

Boasting high resolution accuracy, it detects changing operating conditions automatically, adapting to dynamic driving scenarios on the go.



PCW: Pedestrian Collision Warning notifies the driver of any bicycles, motorcycles, or pedestrians ahead.

FCW: Front Vehicle Start Alarm notifies drivers through warning alerts if a crash is imminent, assisting them in maintaining a safe distance.

LDW: Lane Departure Warning helps in regaining direction should the driver forgetfully or unintentionally change/depart from lanes.

FVSA: Front Vehicle Start Alarm notifies drivers if the vehicle in front starts moving from a standstill, without the driver's car coming within 2 seconds of the car in front.

FPW: Forward Proximity Warning notifies the driver if his/her vehicle starts moving forward while another vehicle is in front within the detection/alert range.



DVR: Onboard Digital Video Recorder records everything in HD (1080p) resolution at 30fps, with the user easily able to trigger recording when needed.

AI RADAR

AI Radar introduces data fusion for a smarter city through data gathering, data utilization, intersection data, and data optimization, all of which work collectively to empower traffic management.

Data is collected first through sensors and cameras, with data aggregation and processing taking place through edge nodes. The AI then processes everything through big data analytics and machine learning.

Decision support is aided via the Traffic Management Center and Traffic Control algorithms.

AI Radar supports the gathering of traffic insights from multiple installations, in order to cater to unique environments on a city-to-city or country-to-country basis.

Additionally, AI Radar helps in understanding traffic flow and average speeds on highways, allowing for effective monitoring of incidents due to illegal acts such as speed violations, wrong lane crossing, driving in the wrong direction – helping authorities enforce traffic rules more effectively.

AI Radar can also be used to manage better traffic flow at intersections, generating insights from multiple attributes, such as traffic violations and lane violations, pedestrians' information, vehicle queue length, etc. All these pieces of data is implemented in real time for the highest efficiency.



DIGITAL TWIN

Digital Twin offers an online live simulation of real-world traffic scenarios on a 1:1 basis.

Real-time vehicle trajectories at an intersection, for example, are converted into a simulation model, with the vehicles in the model representing the real-time vehicle information at the intersection.

2 core technologies help Digital Twin deliver its intended purpose:

Comprehensive road network perception helps to realize high-precision perception of road travel information for all entities on the Digital Twin network, establishing a comprehensive perception network.

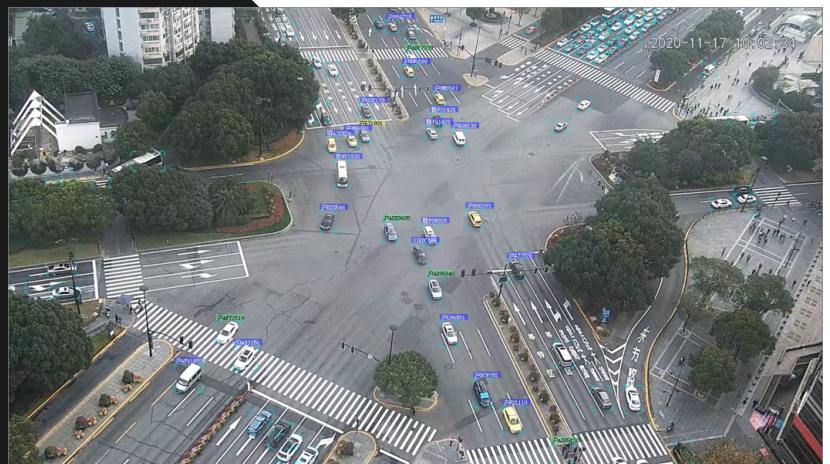
Computational road network transforms the actual road network into a fully digital model using high-precision digital mapping methods. At the same time, detailed traffic rule information is annotated, including road signs, markings, lane attributes, etc. as per the requirements of the local traffic engineering body. In addition:

Digital Twin is a new way of Traffic Command and Control, utilizing technologies like video tracking and video recognition, GPS positioning, data inference and data fusion, allowing the user to monitor the entire journey along with events encountered by the tracked vehicle in real time. This helps to create the historical trajectory and events of associated with a tracked vehicle.

Holographic Road Network provides comprehensive information on pedestrians and vehicles, mapping from reality to virtual digits.

AI-based signal control offers a real-time responsive solution through decentralization, multi-agent collaboration and AI traffic control model, resulting in more proactive control for the facilitation of faster, smarter traffic signal control.

Panoramic views of traffic provide a "God's eye view" of entire road networks in real time.



FLEET MANAGEMENT SYSTEM (FMS)

FMS 2.0 offers a number of exciting and innovative features, such as:

Real time location tracking of vehicles through Digital Twin or Satellite Maps

On-demand video surveillance for real time monitoring and recording/sending videos to the backend system for archiving.

Driver behaviour monitoring to prevent the parking of vehicles in one area for too long, intrusion into illegal driving or parking zones, not looking out for pedestrians' safety, etc.

Incident report tools provides detailed evidence of vehicle incidents and system issues, allowing more efficiency in maintenance & management operations around road accidents and driver behaviour.

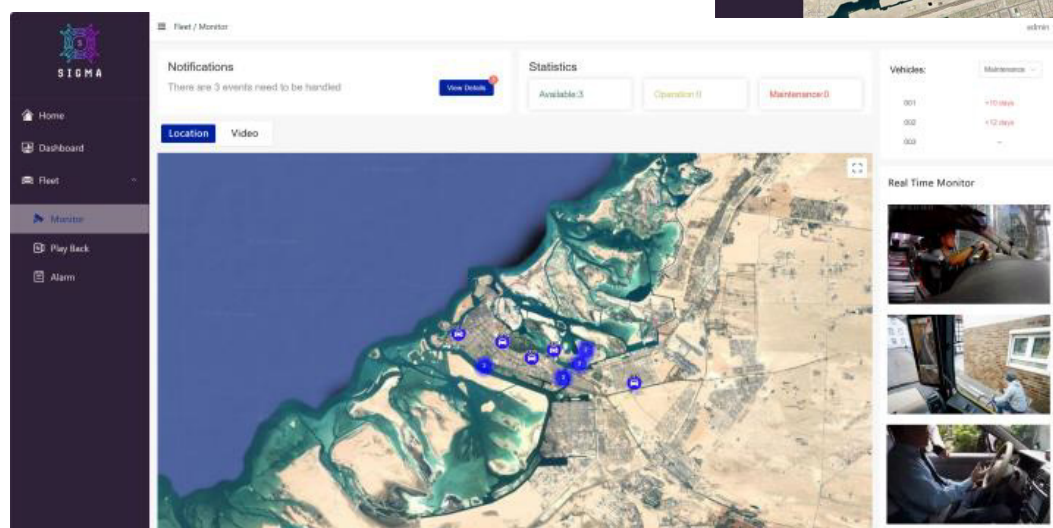
Real-time event monitoring, including speeding alerts, location tracking, driver behaviour alerts, and geo-fencing alerts prevent device tampering like GPS loss, HDD err, video loss, etc.

Analysis and reports offer various statistical data on the entire fleet being tracked, with the ability to export reports in different formats (CSV or PDF) straight to business intelligence systems, for example, or the management for reporting.

FMS synthesizes the location of entire fleets in real-time to provide alerts on geo-fence or restricted zones.

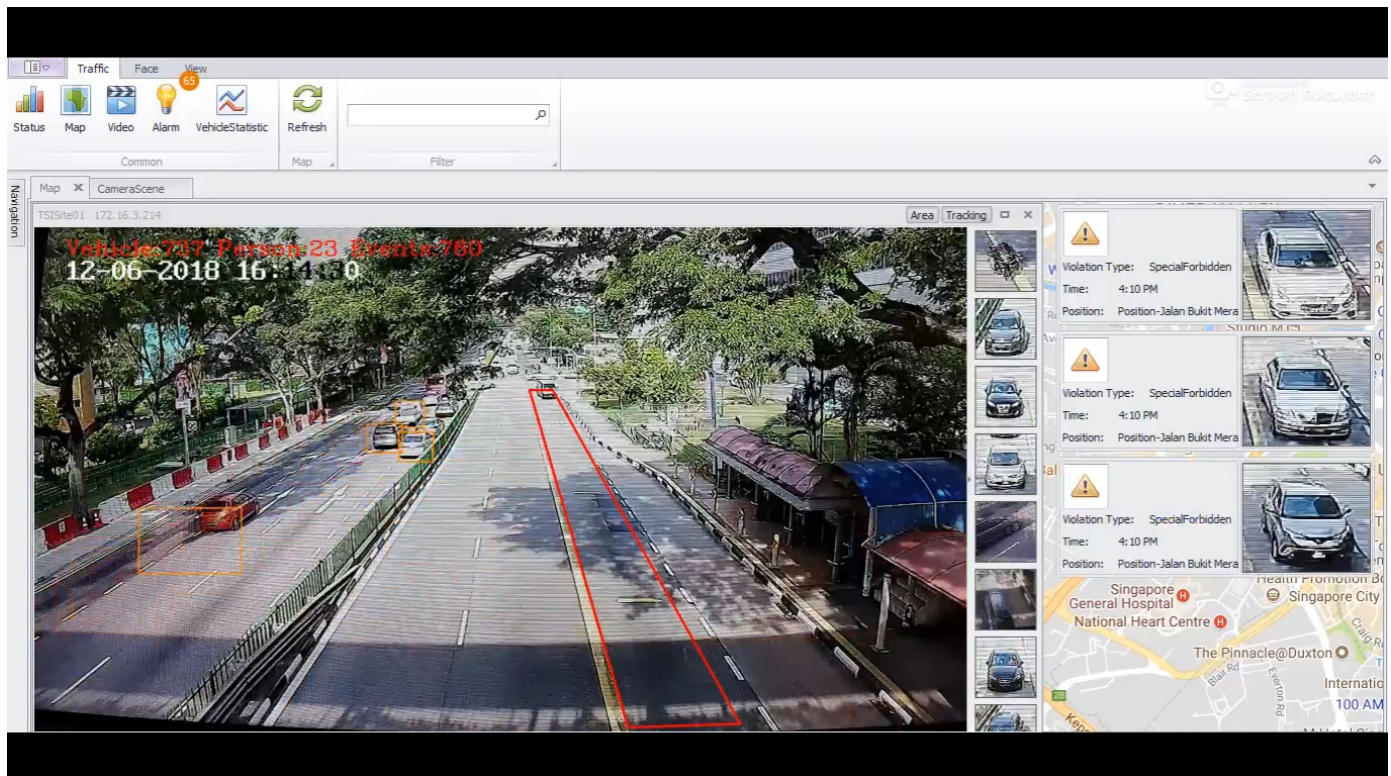
FMS provides a holistic picture to security agencies to carry out unmatched audio and video surveillance at all times.

FMSs web-enabled portal and backend services ultimately provide ease of operations, along with the latest web technologies and tools for using with different platforms.



BIG DATA APPLICATION

- Our core computing product powering everything our features:
- High precision with industry-leading accuracy
- Full algorithm suite with over 100 types of algorithms and over 10 industry algorithm coverage
- Robust computing power with 400-channel video analysis on a single machine
- Powerful, single-cluster architecture for optimum performance
- Great 'openness'; ALL APIs are open and easy to integrate
- Localization – P14 Smart Analysis Card and self-developed localized computing board.
- This makes a broad range of applications possible, including:
 - School/University Campuses; Face + Perimeter + Behavior + Bright Kitchen and Bright Stove
 - Airports and Train/Bus Stations; Face + People Counting + Structuring
 - Office Parks and Leisure Centers; Face + Perimeter + Behavior
 - Production Parks/Facilities; Face + Production Safety Supervision + Perimeter + Behavior
 - Construction Sites; Production Safety Supervision + Construction Site
 - Living Communities; Firefighting + High-altitude Throwing

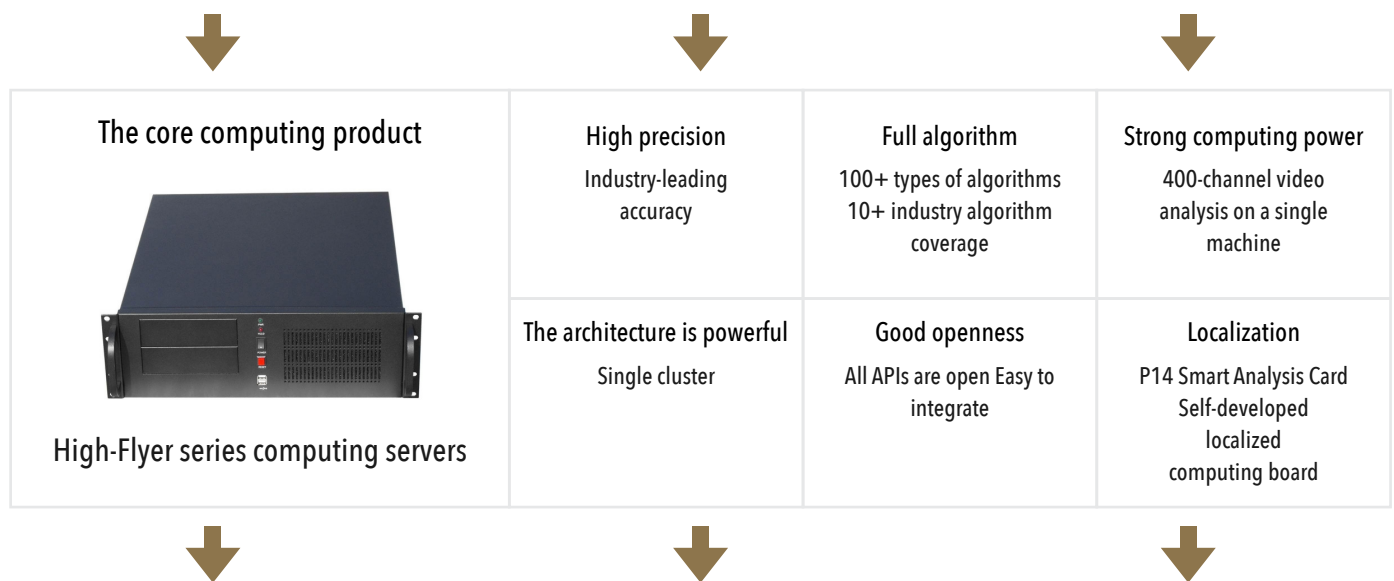


BIG DATA APPLICATION

A more detailed look into what the various algorithms can accomplish:

Our advanced AI security system acts as a virtual watchdog, safeguarding your perimeter with intelligent intrusion detection (crossings, wall breaches) and real-time behavior analysis (running, sleeping, unauthorized phone use). We optimize personnel flow for efficiency, enforce safety protocols (PPE compliance), and trigger instant alerts for a swift response, ensuring complete peace of mind.

FEATURES



APPLICATION SCENARIOS

Campus scene



Face + Perimeter + Behavior +
Bright Kitchen and Bright Stove

Airports/Stations



Face + People Counting +
Structuring

Office park



Face + Perimeter + Behavior

Production parks



Face + production safety
supervision + perimeter

Construction sites



Production safety supervision +
construction site

Living Community



Firefighting + high-altitude
throwing

WHY TSI?

OUR COMPETITIVE EDGE

TSI primarily focuses on understanding its clients' needs in order to provide tailored, high-quality, and cost-effective solutions.

We offer comprehensive support on all our products, exceeding client expectations in each case by delivering innovative and transparent solutions to fully address their needs.

Using the latest technology, our knowledgeable backend team provides advanced and integrated functions, continuously striving for excellence and ensuring the best outcome for our clients.

We utilize technology to solve real-world problems, making people's lives easier and improving the quality of their lives as well.

We're fully dedicated to creating customized solutions which positively impact both businesses and communities.

The TSI Advantage

Our clients trust our ability to face the challenges associated with the markets in which we work in.
Our strengths include:

Solid reputation as a provider and partner that always fulfils its commitments.
Provide the highest quality of human resources.

Continuously strive for excellence and quality.

Complete client focus from start to finish.

Capable of technological transfer among different markets to aid clients across the globe in making the most of our unique products.

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