Smart Science Parks in Taiwan

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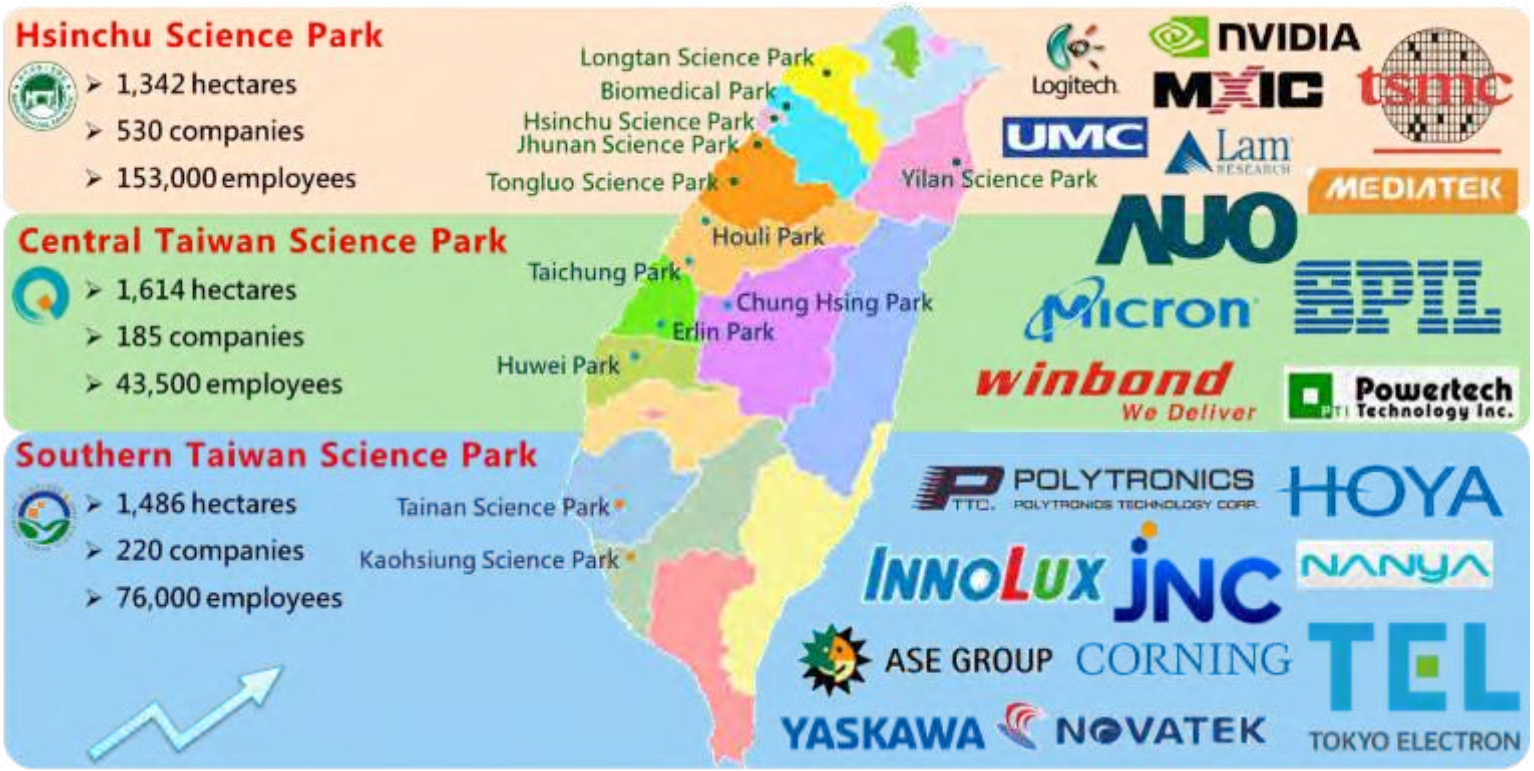
Science Parks in Taiwan

- Driven by the government's policy initiative, the Hsinchu Science Park (HSP) was initiated in 1980; followed by Southern Taiwan Science Park (STSP) in 1997, and Central Taiwan Science Park (CTSP) in 2003.
- Annual Revenue: US$83 billion



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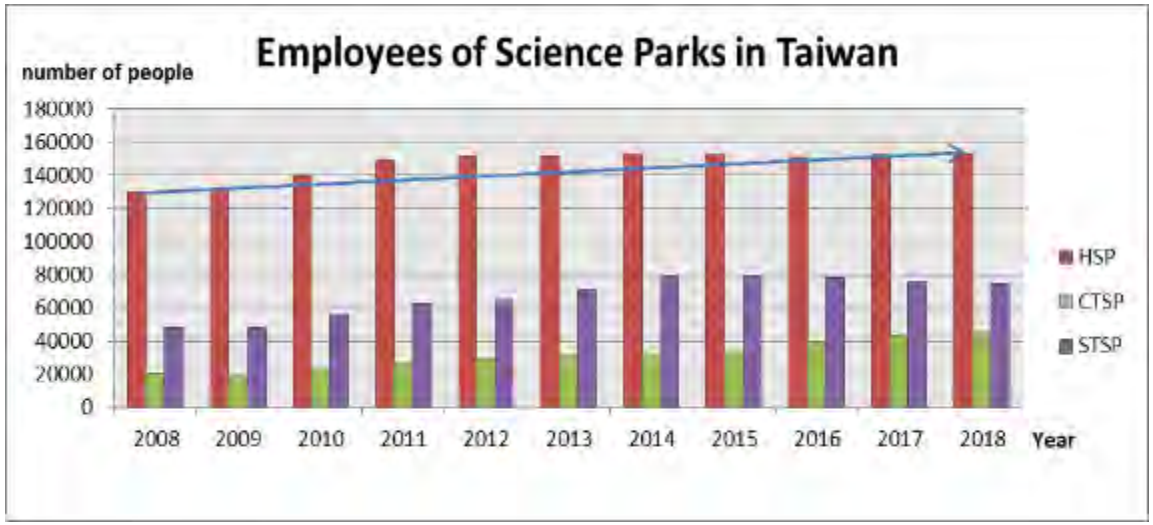
Challenges in Science Parks

- The three science parks in Taiwan have attracted near 1,000 companies with a total of 273,000 employees, posing serious traffic and air pollution problems during rush hours, especially in the HSP.

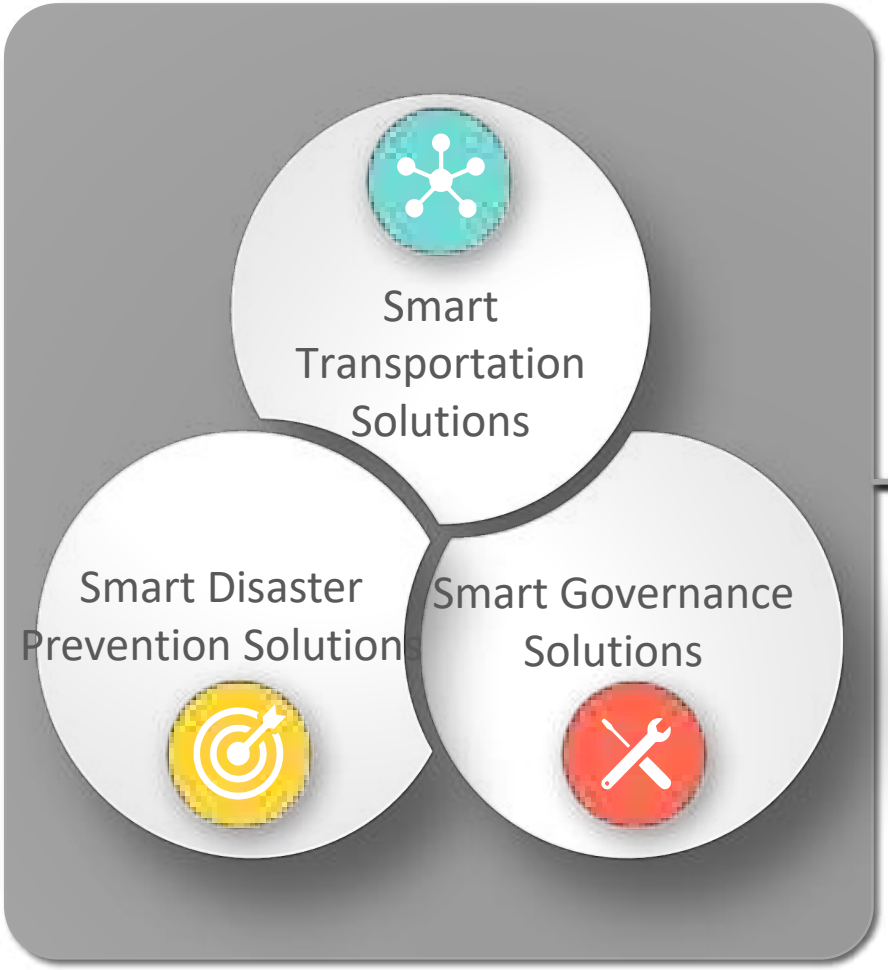


Traffic Congestion

Traffic Accident

Air Pollution

Smart Science Park, Smart Solutions



Smart transportation: smart parking lot, traffic control center, traffic information bulletin APP, demand responsive transportation system(DRTS), electric shuttle buses.

Smart security: autonomous flood prevention and information system, earthquake prediction and smart disaster prevention and control system, on-site smart air quality and climate monitoring system, and on-site smart sewage management system.

Smart sustainability: smart road lighting, smart water conservation and leak prevention, and smart electric meters.

Smart management: Smart utility management, smart buildings complex system, 3D GIS, seamless mobile communication services.

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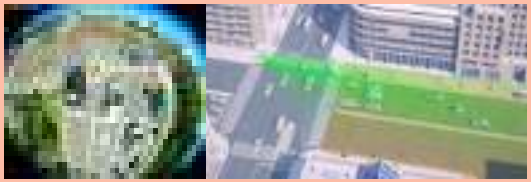
Smart Transportation Solutions

Traffic flow monitoring → Solutions for different road users



Fisheye Monitoring Camera

AI identification + CCTV real-time traffic information

Traffic big data query platform

AI traffic analysis and control system

Traffic control center

For public transportation user

Science Park Mobile App 2.0

Electric bus and Demand responsive transportation system(DRTS)

For driver

Instant traffic guidance - traffic information board

Intelligent parking lot - parking guide and car search

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Smart Disaster Prevention Solutions

Earthquake Early Warning & Smart Disaster Prevention/Relief System

Environmental database → Analysis techniques and solutions

Environmental monitoring data

- Atmospheric monitoring data
- Water quality monitoring data
- Intersection surveillance image
- Earthquake warning data

- Manufacturer's information
- Chemical management data
- Disaster relief equipment data
- Mass spectrometer analysis data

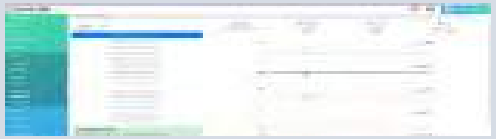
Government open

NCDR

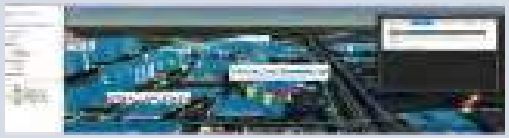
CWB

Disaster statistics and

Disaster relief command and



Earthquake and disaster



Chemical risk management

Disaster prevention drill

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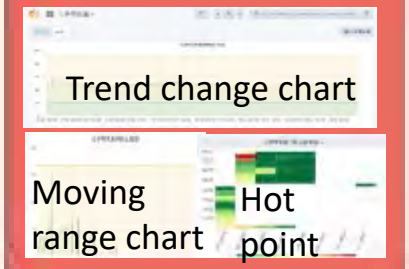
Smart Governance Solutions

IoT Environmental monitoring → Smart, Green and Sustainable Science Parks

Environmental monitoring module

Sewage monitoring module

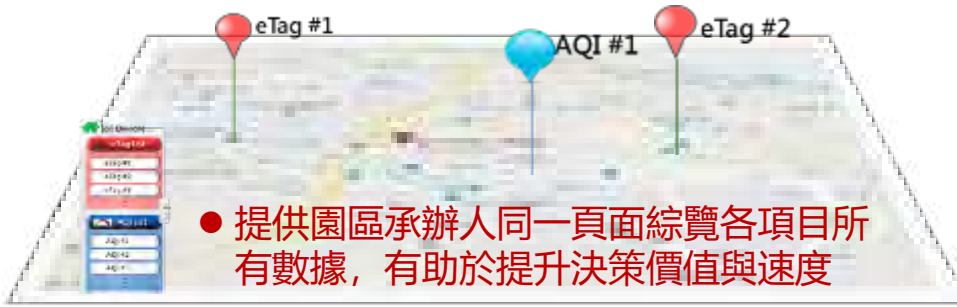


Air monitoring module

Driving dynamic module

✓Real-time information billboard for people

✓Map-based IoT Dashboard for decision maker



- 提供園區承辦人同一頁面綜覽各項目所有數據，有助於提升決策價值與速度

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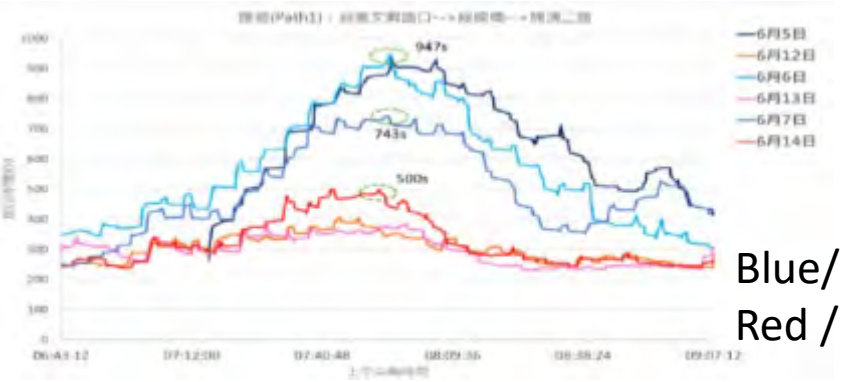
Achievement (1/3):Smart Transportation Solutions

Commuting time reduced 15% and complaints decreased 20%

- **For public transportation user**
  - APP was downloaded by more than 34,000 people and was used by 49.31 million times.
  - DRTS has reduced carbon emission by more than 250 tons, and the number of services has exceeded 100,000.
- **For driver**
  - Parking and car search APP makes the entry & exit time less than 3 seconds.
  - Parking rate increased 8.8% and profit increased 18.2%.
  - Adjustable traffic lights improve congestion by 7.34% during peak hours.



Blue/ Before
Red / after

Before and after the improvement of the congestion section

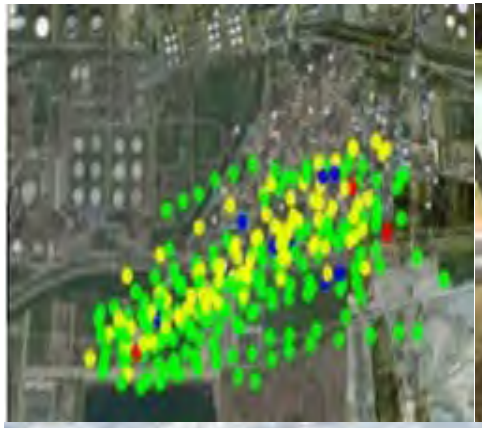
Achievement (2/3): Smart Disaster Prevention Solutions

Building an international-level earthquake warning and smart disaster prevention system

- **This project has been completed in the Southern Taiwan Science Park in 2017-2019.**
  - The system can estimate the maximum earthquake magnitude 3 seconds after detecting the seismic P (Primary or Pressure) wave.
  - The system can even predict the occurrence of large-scale after shakes 30 seconds ahead of time.
- **The system has built up a database/platform which collects and integrates related information (e.g. spatial data, chemical storage, manufacturing process) of all 230 enterprises in the park for disaster prevention.**
- **Furthermore, the system has connected with all enterprises' internal systems and enabled it take actions instantly upon emergency.**

Achievement (3/3): Smart Governance Solutions

- **Smart Air Quality & Weather Monitoring System**
  - The air quality monitoring system monitors the concentration of PM10, PM2.5, SO2, NOx, NO, NO2, CO, O3, THC, etc., and at the same time meteorological information like wind direction, wind speed, temperature, relative humidity, and rainfall.
  - Disclosure of air quality statistics can assure local residents a better environment and help harmonize the parks and nearby communities.
- **Smart Sewage Discharge System**
  - Smart monitoring of water quality saves a great deal of human resources.
  - In case of illegal sewage discharge, the administration can instantly identify the culprit.
  - Better monitoring of sewage discharge and risk management makes the park more comprehensively resilient.



International Awards

The smart transportation projects, achieved great success in terms of energy efficiency and sustainability, and were thus honored by APEC ESCI in 2017

The smart sustainable projects were thus honored by International Safety Award in 2018

International Safety Award
Merit
— 2018 —

This is to certify that

Ministry of Science and Technology - Southern Taiwan Science Park Bureau (STSPB)

has achieved an International Safety Award for demonstrating a strong commitment to good health and safety management during 2017.

BRITISH SAFETY COUNCIL

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Thank You!!