Smart Park
ICT Re-engineering Initiative

Organization:

Ministry of Science and Technology, R.O.C.

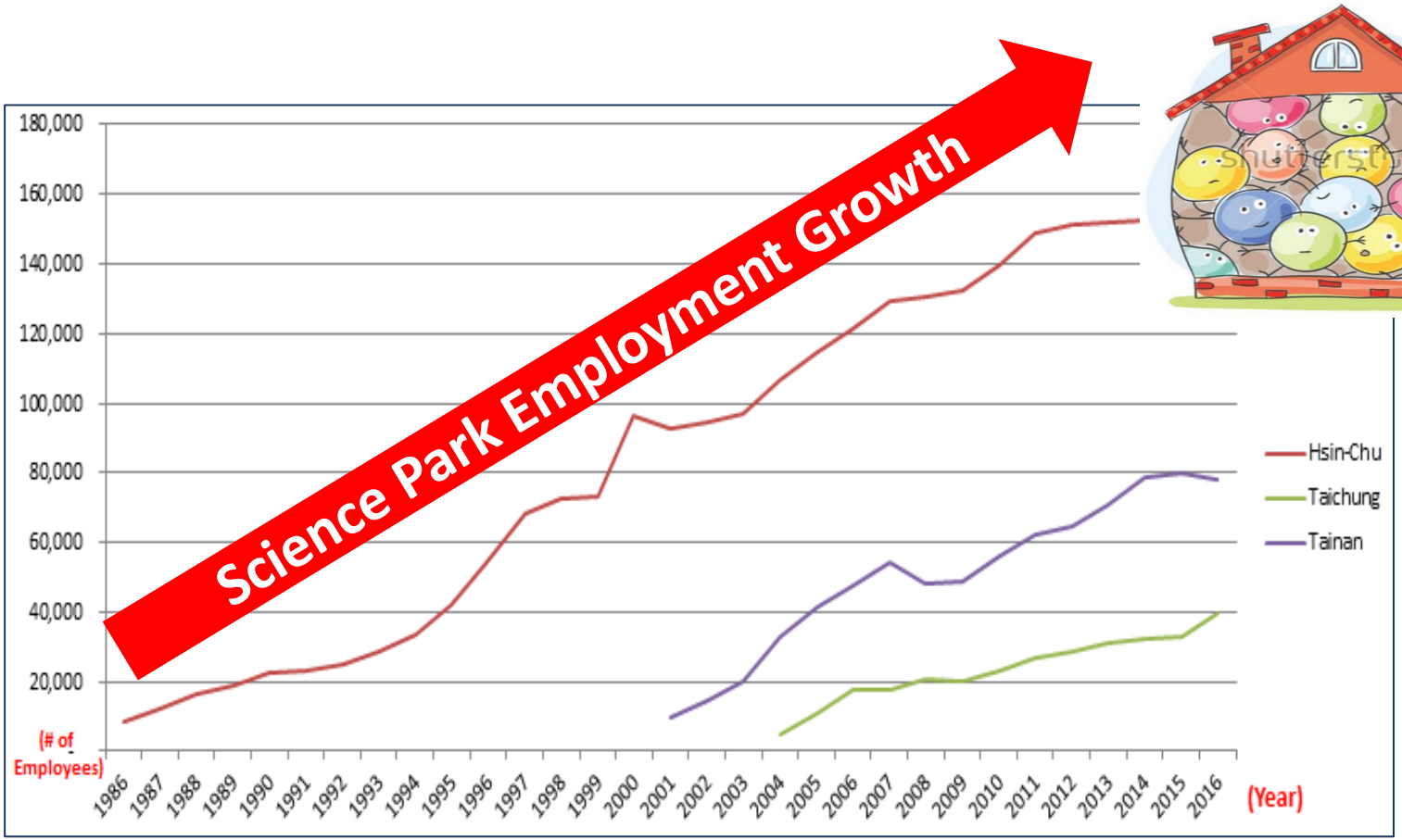
Hsinchu Science Park

Central Taiwan Science Park (Taichung)

Southern Taiwan Science Park (Tainan)

Challenge 1: Traffic Demand

The 3 science parks in Taiwan have attracted more than 800 businesses with a total of 270,000 employees, posing serious traffic problems during rush hours.

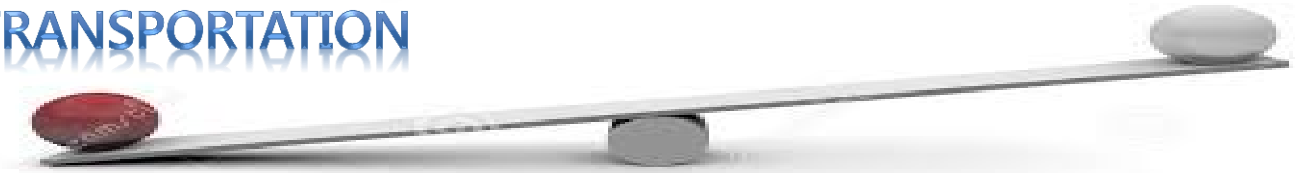


Challenge 2: Threats

The use of private vehicles over public transportation caused traffic jam, air pollution, and CO2 emission.

PRIVATE VEHICLES

PUBLIC TRANSPORTATION



Threats

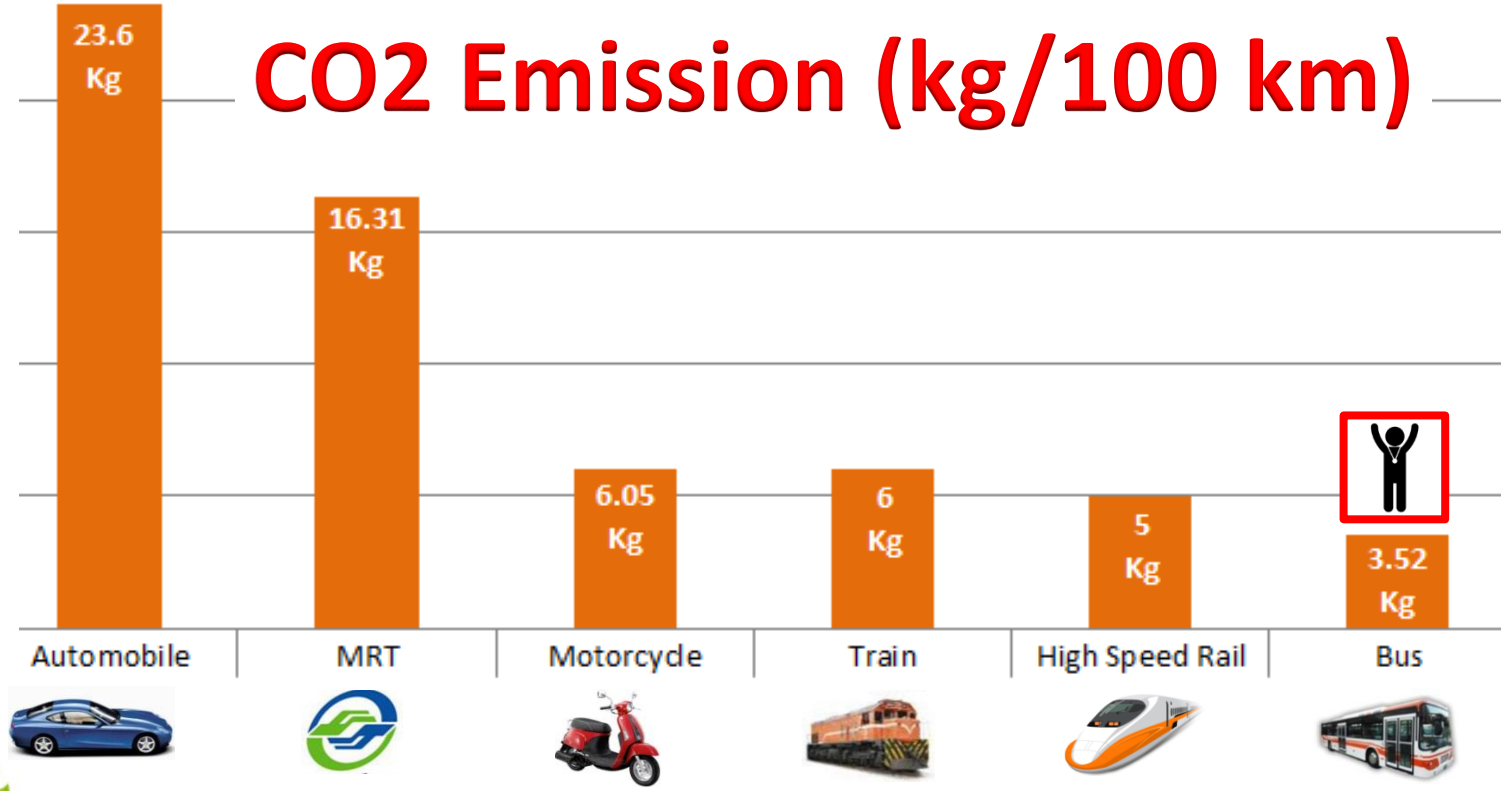
Traffic Jam	Air Pollution	CO2 Emission

Observation 1: Global Trends

Trends	Results / Solutions
Technology Breakthroughs	• Smart everything – smart park, governance, living economy, environment, mobility, etc. • Application of open data
Green Planet Awakening	• Sustainability challenges • Emphasis on eco-responsibilities • Environmental protection
User-Centered, Citizen Participation	• Public-Private-People-Partnership • Transparent governance • Civic engagement

Observation 2: Carbon Footprint

Comparatively, the use of bus emits the least amount of CO2 while automobile generates the most.



Source: Hsinchu Science Park Bureau

Hierarchy of Synergies

"Smart Park ICT Re-engineering Initiative" is under national "Asia Silicon Valley Development Plan".

MOST STRATEGY

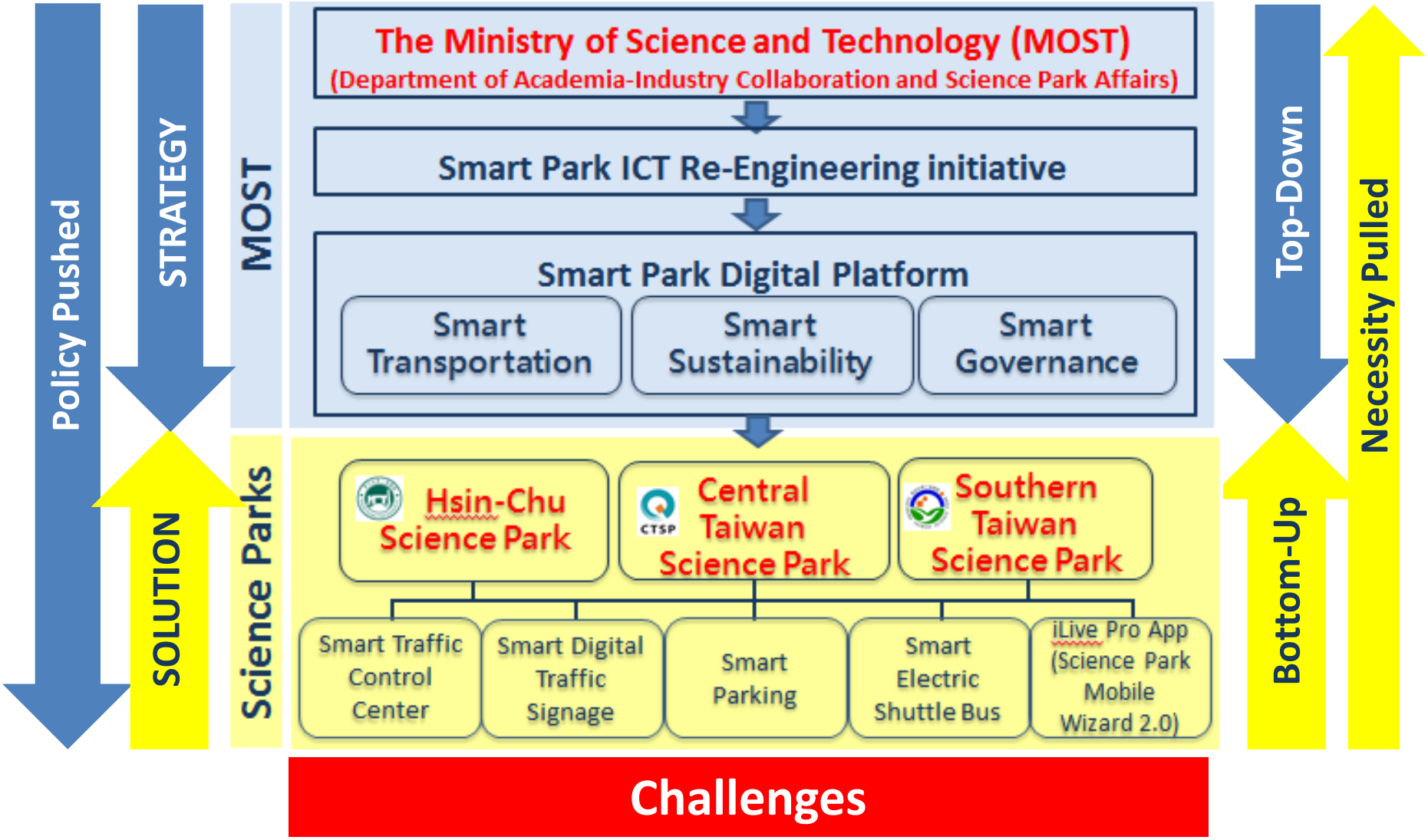
1. Smart Transportation
2. Smart Sustainability
3. Smart Governance

1. Smart Traffic Control Center
2. Smart E-Shuttle
3. Smart Parking
4. Smart Digital Traffic Signage
5. iLive Pro App (Science Park Mobile Wizard 2.0)

Science Parks PROBLEM

1. Traffic Jam
2. Air Pollution
3. CO_2 Emission
4. Limited Parking Space

Initiative Framework



Smart Park Digital Platform

To enhance management and efficiency

- Smart Traffic Control Center
- Smart E-Shuttle
- Smart Parking
- Smart Digital Traffic Signage
- Smart App

Application





- Scheduling Algorithm
- Path Analysis
- Traffic Flow Prediction

Platform

Cloud
(National Center for High-Performance Computing)


Data Center
(3 Science Parks)

- Multilayer network transmission
- Network Security Management

Network

3G/4G/NB IoT (Future)
(WAN) Cable

NFC/BT/WiFi
(LAN)

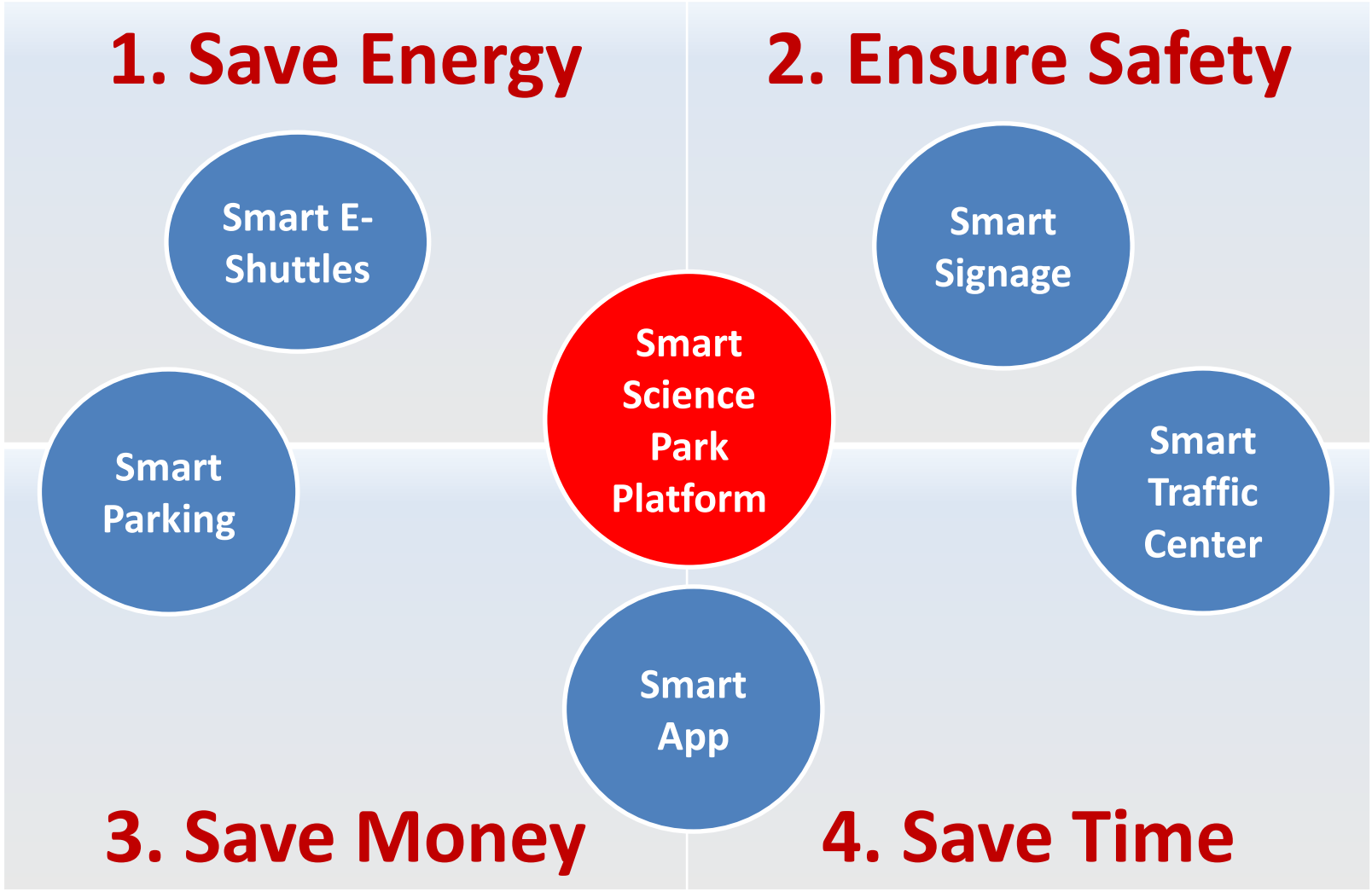
- Sensor IP
- IoT Standards
- Networked Devices

Perception

Cell Phone **CCTV** **LED** **Sensors**

Smart Transportation Solutions

The Core Values of Smart Transportation



Solution 1: Smart Traffic Control Center

Tasks

- Data Collection (eTag, CCTV)
- Dynamic Traffic Management (Active Traffic Management System)
- Traffic Signal Control (Real-Time)

Synergy

- Cross-Department Integration (City Government, Taiwan Area National Freeway Bureau)
- Enhancing Efficiency and Safety
- Local Accessibility (Science Park Mobile Wizard App 2.0)

Results

- Driving time in the park reduced from 30 minutes to 20 minutes during peak hours

Solution 2: Smart E Shuttle

Benefits of Smart E shuttle:

- **Environmental Protection**
- **Sustainable Resources**
- **Energy Optimization**
- **Free WiFi Access**

Science Park	Hsin-Chu Science Park	Central Taiwan Science Park	Southern Taiwan Science Park	Average
CO2 Reduction Per Year	45,605 Kg	8,938 Kg	21,645 Kg	25,396 Kg
Fuel Consumption Saved Per Year	17,491 Liters	6,500 Liters	8,300 Liters	10,764 Liters

Solution 3: Smart Parking

- The time for entering the parking lot is **3~5 seconds** per car.
- The average time for a driver to locate a vacant parking space is **3 minutes.**

Vehicle Fast Pass

Parking Space Signage

Ticketless/Cashless Payment

Security System

Parking Control

Inquiry Check

Solution 4: Smart Signage

Contents

Warning, priority, information, directions, notice, etc.

Synergy

Synchronizing with Taiwan National Freeway Bureau's dynamic traffic database **every 3 minutes**

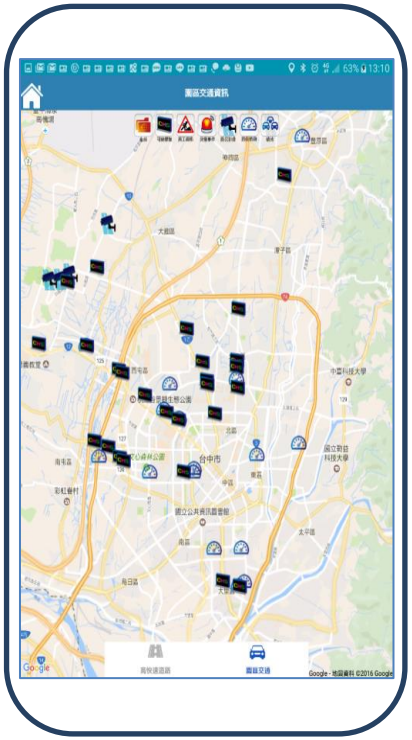
Effects

- Traffic Route Engineering
- Route Planning Assistance
- Traffic Congestion Avoidance

Solution 5: Smart App

©SP Mobile Wizard 2.0

Route Schedules



Maps

Information

Location-Based Service

Traffic Planner

Best Route Navigation

Real-Time Video

Potential Impacts

The initiative promotes overall synergy and performance of the science parks and orchestrates various solutions to enhance the efficiency of science park management.

- Quantifiable results:
  - A total of **960,000** kg CO2 emissions reduced and **119,100** liters of fuel consumption saved.
  - A total of **21,662** hours of traveling time saved every year.
  - A **5%** reduction of travel time with the growing traffic demand (increase of cars every year).
  - The entering time to the parking lot is **3~5** seconds per car., and the average time to locate a vacant parking space is **3** minutes.

Conclusions

- Under the guidance of Ministry of Science and Technology (MOST), "Smart Park ICT Re-engineering Initiative" is launched to transform Hsin-Chu, Central Taiwan (Taichung), and Southern Taiwan (Tainan) Science Parks into smart and sustainable parks.
- The initiative will ensure science parks' sustainable development and ultimate advocate as "the best Energy Smart Communities".

Thank you!