Goyang Smart City Best Practices and Future Plan for Creating a Base-type Smart City

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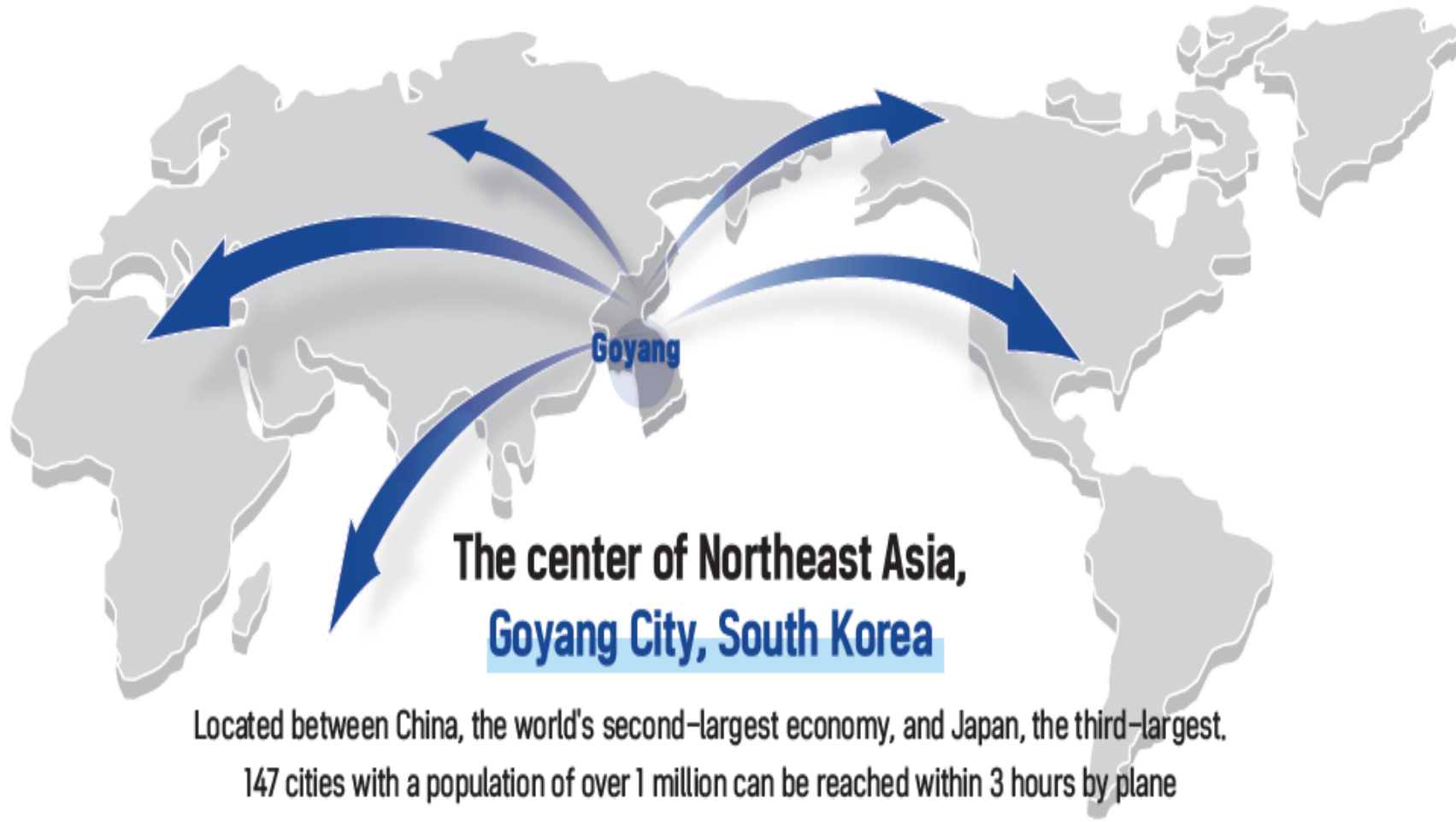# Contents

Status of Goyang Smart City

The center of Northeast Asia,
Goyang City, South Korea

Located between China, the world's second-largest economy, and Japan, the third-largest.
147 cities with a population of over 1 million can be reached within 3 hours by plane

Size
268.08 Km² (2.6% of Gyeonggi-do Province)
| Deokyang-gu 165.58km², Ilsan-dong-gu 59.95km², Ilsan-Seo-gu 42.56km²

Population / households
1,074,705 (domestic population) /
460,173 households

Administrative districts
Three districts Deokyang-gu/Ilsan-dong-gu/
Ilsanseo-gu (44 viallages in total)

financial size
$2.6498 billion
| general accounting $2.4326 billion | special accounting $546.05 million

Perfect Logistics
Transportation
Adjacent to Incheon
International Airport, the
world's No. 1 Northeast Asian
HUB for 12 consecutive years

Abundant high-level
manpower
70% of Korea's R&D centers in
the metropolitan area, and 113
universities are located, so it is
possible to secure excellent human
resources.

Optimal Enterprise
Environment
Active support from
the central government
Various incentives in the
Gyeonggi Free Economic Zone

High quality of life
Rich settlement conditions by
creating perfect living
infrastructure that meets
international standards

A smart city is a sustainable city that provides various urban services based on urban infrastructure built by converging and combining construction · information communication technologies to improve the city's competitiveness and quality of life.

(Act on Smart City Creation and Industry Promotion, 2021)

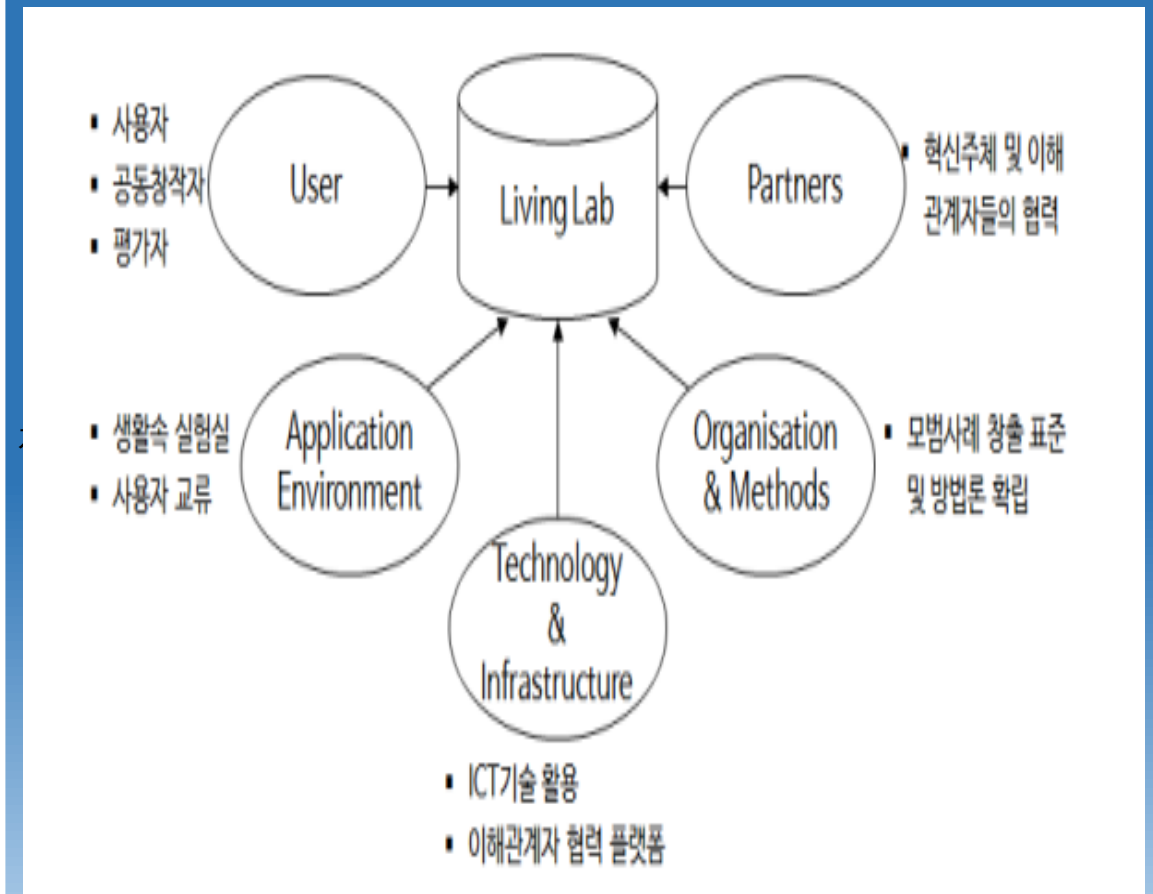Source : https://smartcity.go.kr

Concept of Smart City Living Lab

Living Lab is a series of process and governance where citizens come together to find urban problems and solve them with private smart technologies

✓ Smart City Living Lab

Source : https://smartcity.go.kr

✓ Key factors of Living Lab

Source : Living Lab Utilization Plan to Promote Regional Innovation, 2019

이동환 실험실 인증서
과학기술정보통신부
국제표준화 시민해결단
독일 WeGO
중소기업 현지시각
프로젝트 실증사업
과학기술
광역지자체 주제발표자 기념촬영 지방자치단체 중심
전문가 화성 사회혁신
영국표준협회 대상지
대구시 진흥원 도시문제 발굴
스마트도시 시범인증 스마트 도시 ISO37106
시민들 BSI 착수보고회 국토교통부
경제자유구역 영상 공모전

[Goyang Smart City Living Lab word cloud analysis result, 2023**]**

From Goyang U-City to Goyang Smart City !!

CCTV image integration

CCTV installation

Appropriate technology + ICT

Traffic information center

Goyang U-City

Ubiquitous city

- Revision of smart city act
- Activation of citizen's participation
- International cooperation and globalization

Security control center

Citizen safety center

ITS

Communica-tions infrastructure

- Siksa, Deoki districts ✓
  2008 ~ 2012

- Samsong district ✓
  2010 ~ 2017

- Jichook, Hyangdong Deokeun district ✓
  2016년 ~ 2020

U-City outcome links to "Smart City"

- Create sustainable smart city ecosystem
- Achieve technological innovation and create creative jobs
- Vitalize citizens' participation and regional economy

Legally defined Goyang smart city plan (2019 ~ 2023)

Goyang Ubiquitous City

Establish U-City in Siksa district and Deoki district	Establish U-City in Samsong district	Establish Goyang Ubiquitous urban plan	Opening the Civil Safety Center Integration of CCTV Recordings	Establish U-City in Jichook, Hyangdong, Deokeun districts	Establish IoT convergence pilot complex
2008 ~ 2012	2010 ~ 2017	2013	2015	2016 ~ 2020	2016 ~ 2017

Revision of smart city act

Goyang Smart City

Implement smart city Living Lab project	Establish Goyang smart city plan	Creation of new deal regeneration of Smart City in Hwajeon area	Creation of Goyang Ilsan TechnoValley (Expected)
2018년 ~ present	2019	2023	2026

Existing City

+
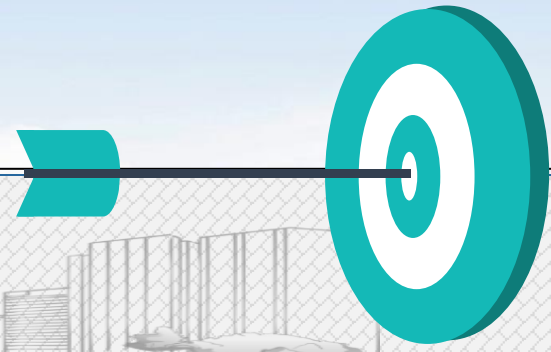
New towns

Smart City Regeneration Living Lab Demonstration

Development of complexes such as new towns and new smart towns

Goyang Smart City

DATA

Advanced Technology

Citizen Happiness

" Development Project for IoT Convergence/Complex " provide various IoT services to citizens by building sensors throughout Goyang City

Names of services

1st Development Project

Smart park environment service
* Environmental security light, safety fountain, lake management

2016

Smart living environment service
* Safe daycare, air quality monitoring service

Smart ecological environment service
* Biomass odor monitoring

Safe parking service, etc.

2nd Development Project

Smart waste collection management solution

Multi-Environmental streetlight service

Smart quarantine service, etc.

2017

Major IoT Development Project

Smart park environment service	Smart living environment service	Multi-environment street light service

Smart ecological environment service	Safe parking service	Smart quarantine service

Monitoring room operation that can monitor IoT service equipment status and service data

"Ecological environment service" that measures the odor of the biomass treatment plant in Goyang and informs the degree of odor

Smart quarantine service to minimize mosquito complaints

Installation equipment

Examples of data collection and analysis

Analysis of mosquito population change in 2020

measurement period

2020-04-28   2020-07-08

측정장소

모두

mosquito population

107,746

Mosquitoes by place

측정소 위치
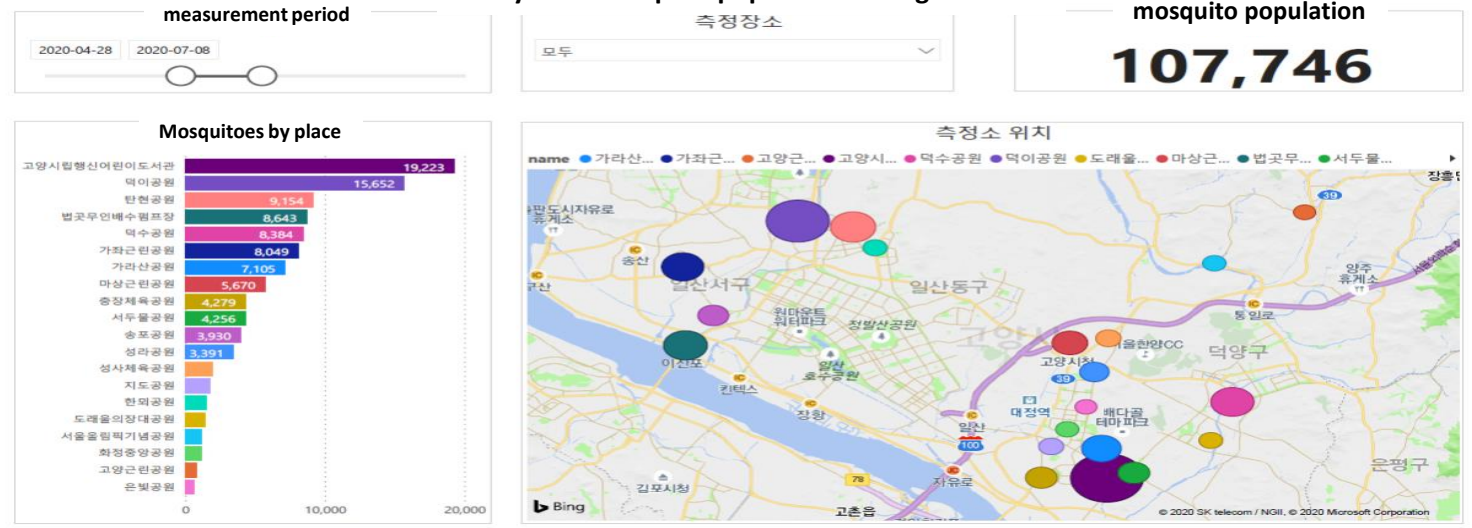
Current Status of Goyang Smart City Living Lab
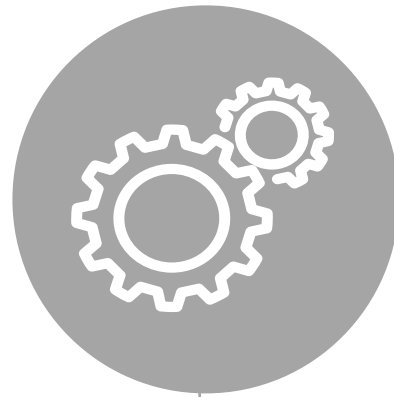
Need to discover and expand citizens' tangible services after the IoT pilot complex construction Project in Goyang, "Start building Goyang-type Living Lab system(2018)"

Why does Goyang continue to promote Living Lab?

Regeneration of the old city center and evolution into a smart city

Test-bed role for SME technology development

Resolving local issues such as transportation, environment, and health care, etc.

Goyang Smart City Living Lab : Process

Problem Discovery Living Lab

▶ Search for solutions by discovering local problems through the operation of citizen solution groups

Problem-Solving Living Lab

▶ Problems discovered by citizens are solved with solutions that apply the company's cutting-edge technology

Process for Problem Discovery Living Lab

1 Recruitment and selection of citizen solution groups	2 Problem definition and site survey	3 Specifying the Problems	4 Finding Solutions	5 Prototype Experiment
▪ Recruitment and selection of citizen solution groups	▪ Interview with local residents, survey ▪ local residents meeting, on-site inspection	▪ Masang Park turned into crime – hidden zone ▪ Illegal dumping of garbage in Haengsin 2-dong	▪ Finding a solution by collecting residents' opinions ▪ Gathering expert opinion and technical advice	▪ Prototyping, installation, testing ▪ Deriving RFP for each of task

Living Lab Business by Year (2018 ~ Present)

■ [Hwajeong 2-dong] Improving the illumination of pedestrian roads in the inconvenient traffic area
■ [Pungsan-dong] Reduction of fine dust in public facilities for the elderly and children
■ [Daehwa-dong] Improved illegal dumping of garbage
■ [Gwansan-dong] Improving pedestrian safety through IoT smart pedestrian path installation

2019

2020
■ New problem discovery project
· Dreaming Dandelion / Dream Home / Restart
■ Social problem-solving living lab project
· Infectious disease prevention/ disability prevention service
■ Carbon Reduction Living Lab Project

2021
■ Problem Solving Living Lab
· One-way reverse driving alert
· Cancer patient health care service
■ Problem Discovery living lab
· Little Goyang Citizen / Dream Home / Haengsin 2-dong Residents' Association

2022
■ Problem Solving Living Lab
· Garbage dumping prevention service
· Solar lighting bench service
■ Problem Discovery living lab
· USCREATE/ Gajwa Love Residents Association

2018
■ Demonstration of integrated waste management solution service for efficient waste treatment
■ Demonstration of smart pedestrian road IoT for elementary school students' pedestrian safety
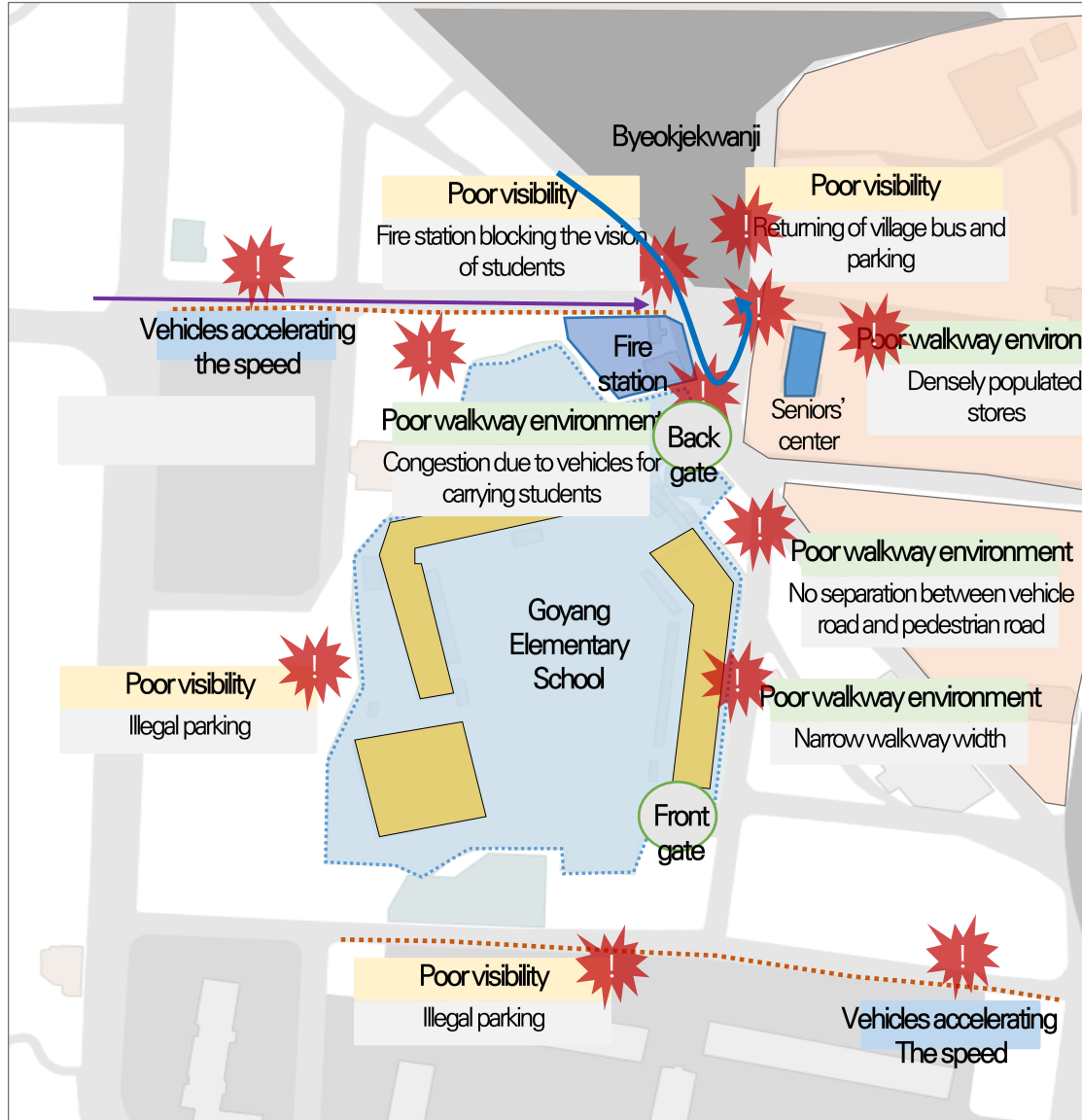
Goyang Smart City
Best Service Cases

"Smart IoT walkway demonstration project" for the safety of elementary school students

Environment analysis of Goyang Elementary School and survey results targeting elementary school students

Smart intersection

Talking smart notice board
(Byeokjekwanji intersection)

Talking smart notice board
(Byeokjekwanji intersection))

말하는 스마트알림판(현대아파트 후문 교차점)

바닥경광등

Smart crosswalk

Talking smart notice board (back
gate of Goyang Elementary
School)

Assistive device for smart notice
board

횡단보도 경광등

Notice for pedestrians

Crosswalk at the back gate
of Hyundai Apartment

보행자
조심

보행자
조심
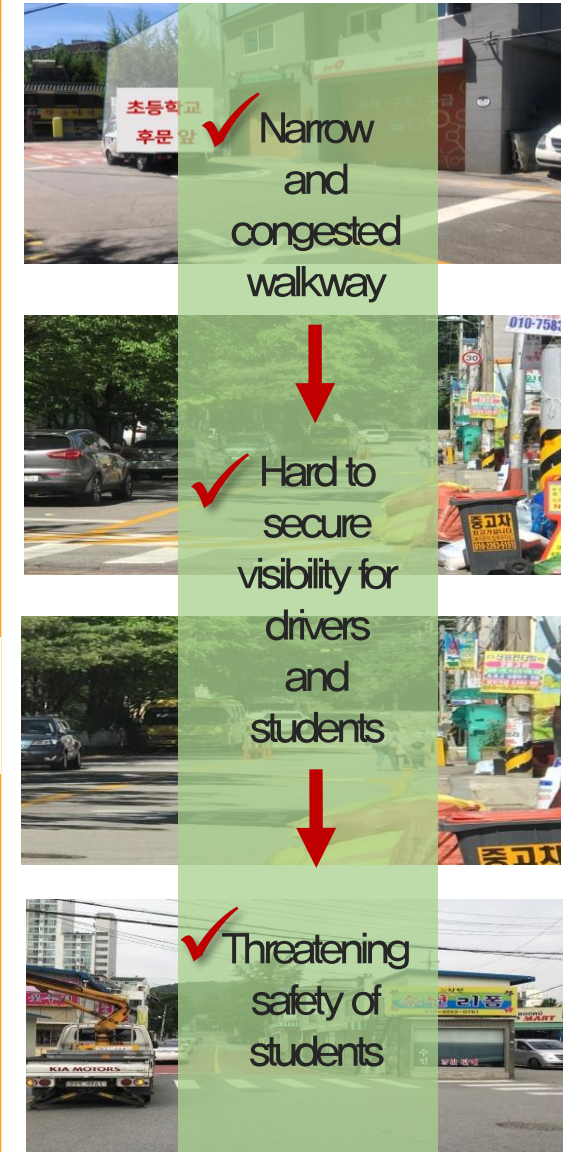
Speed limit notice

Awakening smombie

Effect of Smart IoT Pedestrian Road

9월 1일 측정된 평균속도 :
37, 275 km/h

3달후

12월 7일 측정된 평균속도 :
29, 893 km/h

Acquirement of the innovation Champion for the expansion of innovation cases In residents' lives(2020)
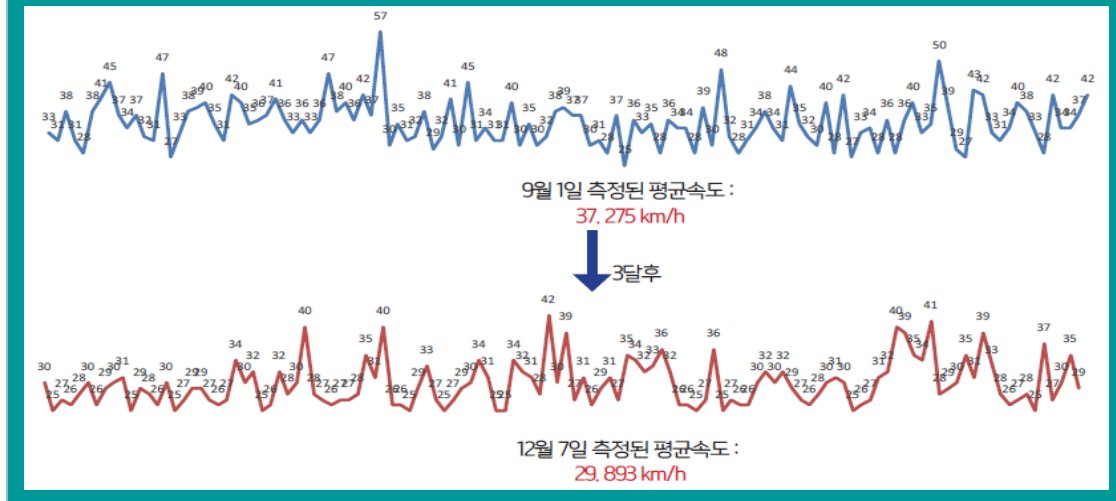
"Smart Insol Location Service(KKO-KKASIN)"

Found Miss Jo after 10 days of missing "ALIVE"

▶ 58% were not found after 12 hours of Disappearance

▶ Classified as long-term disappearance after 48 hours of disappearance

▶ Disappearance of people with developmental disabilities

20's 30.7% > 30's 23.9% > teenagers 16% > over 40's 16%

Why shoes?

NAVER | Disappearance prevention rules
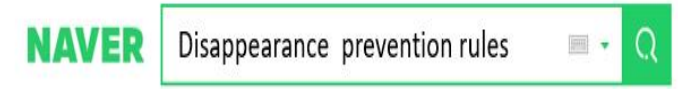
If your child is young or unable to speak due to a disability, please wear a missing child prevention product When writing your name and contact information, it is better to engrave it on the inside of clothes or the soles of shoes that are not easily visible from the outside. This is because it is easy for strangers to access and can lead to kidnapping.

Black basketball shoes

White basketball shoes

Looking for a person with visually impaired

Missing person

Looking for missing child

Orange color shoes

GPS & LTE-M
Identification of the location
through GPS & LTE-M module

LTE-M

olleh kt

PUSH & DATA

The coordinates of the latitude and
longitude of the **SMARTPHONE**
are received Automatic
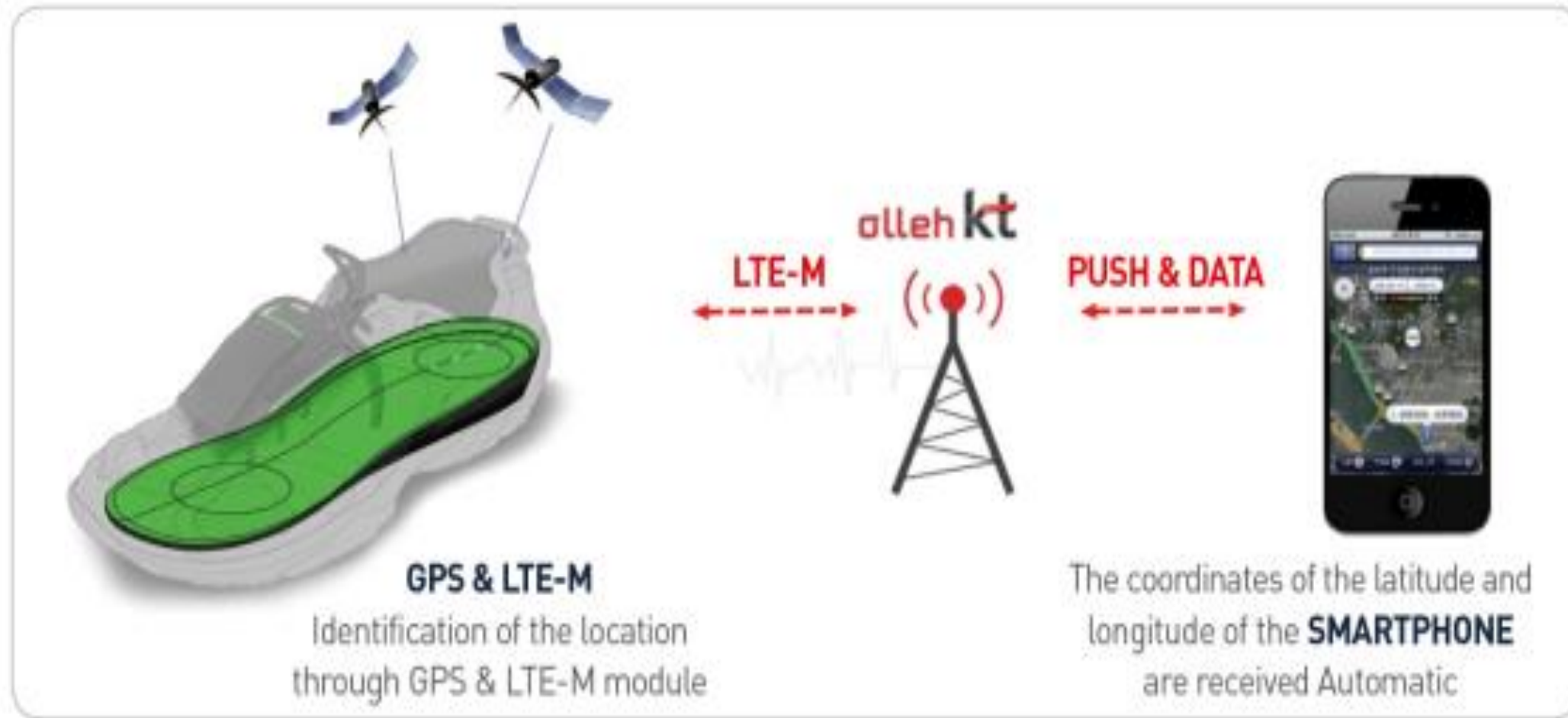
▶ Smart GPS insoles(location tracking devices using IoT Communication and GPS) are mounted on the shoes

▶ Upon disappearance, the real-time location information is provided to the smartphone of the parents of the disabled

Case of Service for the Disabled

Identification of Real-time location

Smart Insole
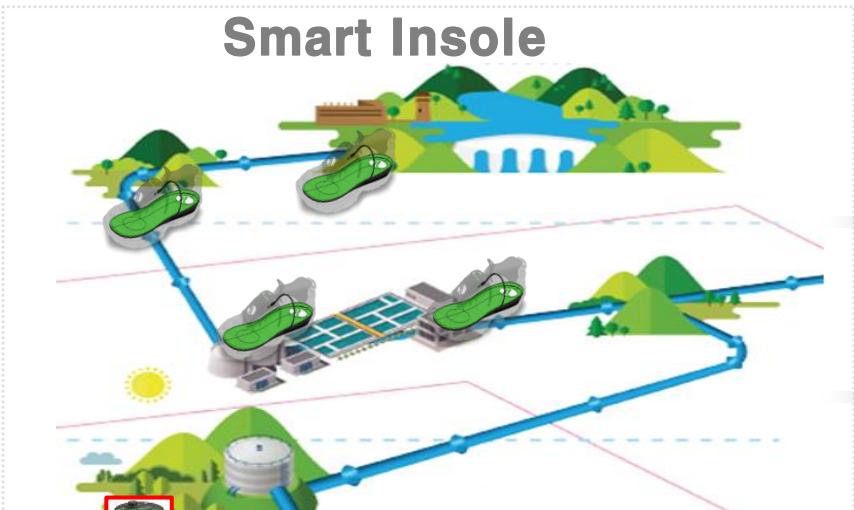
Elderly dementia patients (2018)

Developmental disabilities (2020)

Monitoring/Controlling

Let's jump with Kokasin on!

Integrated monitoring
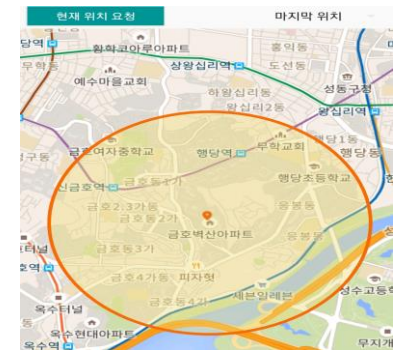
Individual monitoring (mobile App)

User Setting (address, safe zone etc.)

Notification with smartphone app

It's out of the safe zone

Case of Service for the Disabled

Care

Have you ever used an existing tracking device?

60%

Do you feel the need for a tracking device?

96%

Has the user ever experience roaming?

78%
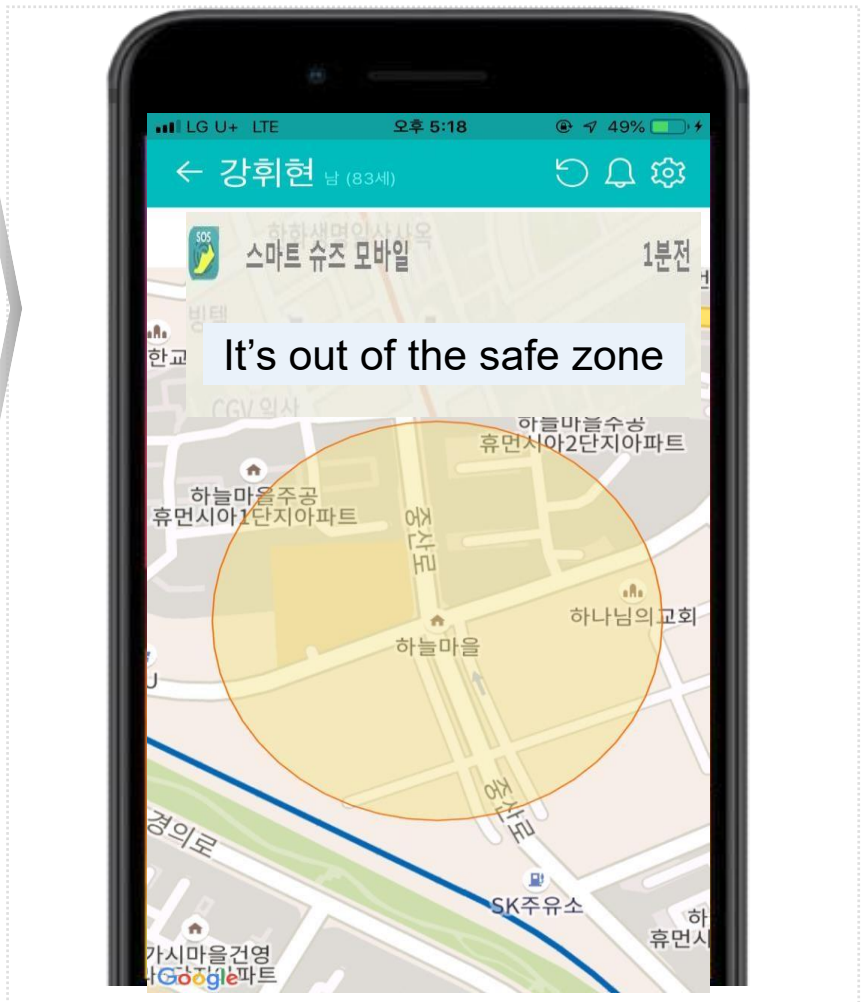
Smart Insol Satisfaction Survey (Goyang, Gyeonggi-do)

| Service and product Satisfaction | 82% | Very satisfied/Satisfied |
| Service continuation | 91% | Keep using the service |

Care
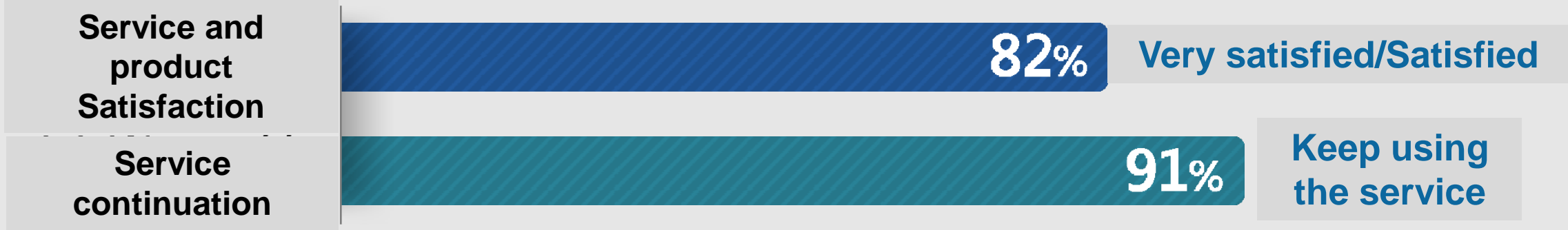
President's Prize(2018)

GPS Smart shoes

Integral shoe with module installed

Prime Minister's Award(2020)

GPS Smart Insole

Smart GPS insoles are mounted on the shoes

Prevention of disappearance and quick response in case of disappearance when extended application to **developmentally disabled** and **dementia elderly** with high disappearance rate
"**Designated as an innovative product by the Public Procurement Service in 2023**"
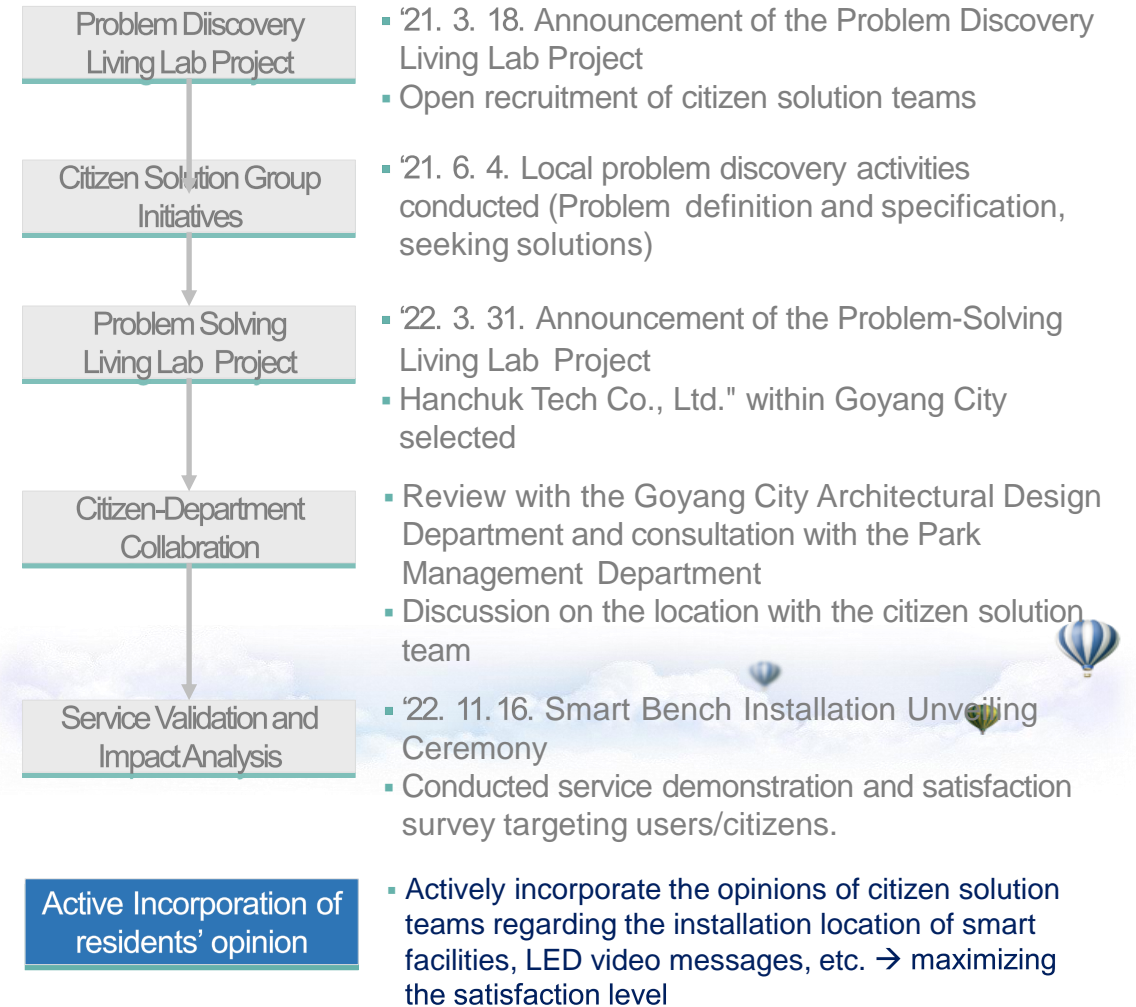
"Solar-Powered lighting bench" to prevent crime in Ma Sang park

Community Engagement Site

Collect creative ideas with participation of various stakeholders such as citizens, city council members and neighborhood association leaders

Collect opinion and coordinate Project direction

The Living Lab Implementation Process

Process	Details
Problem Diiscovery Living Lab Project	• '21. 3. 18. Announcement of the Problem Discovery Living Lab Project • Open recruitment of citizen solution teams
Citizen Solution Group Initiatives	• '21. 6. 4. Local problem discovery activities conducted (Problem definition and specification, seeking solutions)
Problem Solving Living Lab Project	• '22. 3. 31. Announcement of the Problem-Solving Living Lab Project • Hanchuk Tech Co., Ltd." within Goyang City selected
Citizen-Department Collabration	• Review with the Goyang City Architectural Design Department and consultation with the Park Management Department • Discussion on the location with the citizen solution team
Service Validation and Impact Analysis	• '22. 11. 16. Smart Bench Installation Unveiling Ceremony • Conducted service demonstration and satisfaction survey targeting users/citizens.
Active Incorporation of residents' opinion	• Actively incorporate the opinions of citizen solution teams regarding the installation location of smart facilities, LED video messages, etc. → maximizing the satisfaction level

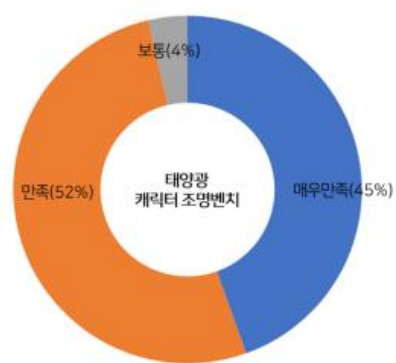## Service validation and impact analysis

Results of citizen satisfaction surveys

- 기능별 만족도(태양광 캐릭터 조명벤치)
- 기능별 만족도(태양광 영상 조명벤치)

보통(4%) / 만족(52%) / 매우만족(45%) / 태양광 캐릭터 조명벤치

보통(4%) / 만족(52%) / 매우만족(45%) / 태양광 영상조명벤치
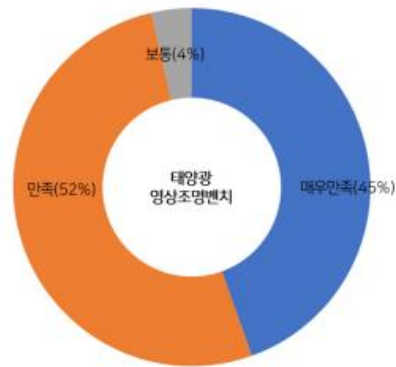
▪ 97% are satisfied overall

Media coverage and award achievements

Shall we meet at the smart bench in the Ma Sang park after dinner?

고양시 '2023 월드 스마트시티 엑스포 어워즈' 선정

Recipient of the 2023 World Smart City Awards in the City category (September 7, 2023)
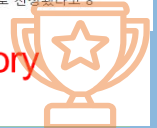
04 Summary of Achievements

1 **Smart city services for solving local issues in Goyang City have spread nationwide**

- Smart IoT pedestrian paths for elementary school students' safety → Won the 2020 Resident Life Innovation Case Champion award → Expanded to Sejong City, Gumi City, etc.

2 **Connecting the local issues identified with citizens to the problem-solving Living Lab project and continuously pushing forward as smart city services**

- Local issues identified in 2021 → Completed as a problem-solving Living Lab project in 2022

3 **Leading the way in fostering a culture where Goyang citizens can continuously participate in the realization of a smart city, promoting citizen leaders' development**

- Selection of 'Smart Citizens' in which community council members, village activists, and any interested residents can participate, with support for community activities provided (from 2021 onwards).

4 **Driving corporate growth by providing service demonstration opportunities to companies participating in the Living Lab**

- The smart IoT and pedestrian path installation products were designated as recommended innovative products by the Patent Office in 2020 (ITS Bank Co., Ltd.) → Increased Sales

- Products from three companies participating in the Smart Living Lab were designated as innovative products by the Public Procurement Service in 2023, resulting in significant achievements.

05 Implicatons

1 **Establishing a close collaboration system between the Goyang City's supervising department and the executing and managing institutions**

- From the stage of establishing the Living Lab project plan to demonstrating the solution, all processes were closely coordinated with relevant departments of Goyang City

2 **The Local business promotion agency plays a bridging role between the local government ↔ companies ↔ citizens**

- From Beyond the role of the project management institution, they serve as a bridge between stakeholders throughout the project process, mediating and coordinating disagreements and differing opinions

3 **Establishing Goyang City's unique process through various Living Lab methodological approaches**

- Experimenting with Living Lab projects in various ways, such as operating entities and methods of citizen participation → Settling an optimized Living Lab process unique to Goyang City

4 **Implementing sustainable smart services through technology demonstrations based on citizen demands**

- From the problem-solving stage, discussions with demand agencies and maintenance departments to establish sustainable services

WORLD CITIES FORUM 2023

Future Plan for Creating
a Base-type Smart City

The base-type smart city is a project to create a smart base that can enhance regional competitiveness and lead the spread of smart cities, and will be created at a scale of 40.2 billion Korean won for three years

Project Name	Creating a base-type smart City of Goyang Special City
Location	Goyang Special City
Project Area	268.08 square kilometers
Project Duration	August 2023 to December 2025

Data Hub & Digital Twin-based S-Curve Smart City Construction

01 **Governance**

▶ Establishment of Goyang Smart City Innovation Center

Key roles

Goyang Smart City Support Center

· Smart City Service Validation
· Discovery of Services Based on Living Labs
· Citizen-Centered Governance Operation

Goyang Smart City Innovation Center

· Establishing a Smart City Hub
· Expanding into an Innovation Center
· Building Industry-Academia-Government

Goyang Smart City Hub Center in Nordern Gyeonggi

· Establishment of Goyang City Integrated Data Hub
· Operation of Data Linkage in Northern Gyeonggi

Data Hub & Digital Twin-based S-Curve Smart City Construction

02 Services

▶ Smart pole and Media wall, Demand-responsive and Autonomous Services

▶ Data-alive-based traffic optimization service, Establishment of Dron Valley

Smart pole and Media Wall

Demand-responsive and Autonomous service

Data-alive-based traffic Optimization service

Establishment of Dron Valley

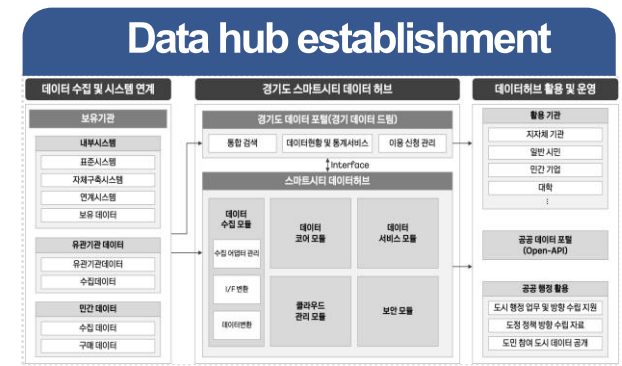## Data Hub & Digital Twin-based S-Curve Smart City Construction

Infrastructure

▶ Intelligent administration service

▶ Digital twin, Data hub establishment

Providing Citizen-Centric Administrative Services via KakaoTalk

Digital twin service

Data hub establishment

Thank you !