

# 국외출장 결과보고서

기 간: 2022.11. 23~2022. 11. 29

출장지: 영국(글래스고, 런던)

출장자: 김동한

국토연구원



공간정보사회연구본부

## I. 출장개요

1. 출 장 지: 영국(글래스고, 런던)

2. 출장기간: 2022 11. 23 ~ 11. 29

3. 출 장 자

소속	직급	성명	비고
공간정보사회연구본부	연구위원	김동한	

4. 출장목적

☐ 빅데이터 기반 인공지능 활용 도시계획 기술개발 연구사업 수행을 위한 국제연구네트워크 구축

- 빅데이터 기반 인공지능 활용 도시계획 기술개발 연구의 성공적 추진을 위해서는, 다양한 빅데이터를 수집, 연계, 통합, 활용할 필요가 있는데, 이를 선도적으로 추진하고 있는 영국 글래스고 대학의 어반 빅데이터 센터를 방문하여 지식과 경험을 공유하고 향후 교류협력 방안을 논의
- 빅데이터 기반 인공지능 활용 도시계획 기술개발 연구는 다양한 빅데이터를 활용한 도시지표와 도시모형을 개발하는 것을 중요한 목표로 하고 있는 바, 도시분석 및 도시모형에 관한 국제적 연구성과를 보유하고 있는 영국 런던대학교의 첨단공간분석 센터를 방문하여 지식과 경험을 공유하고 향후 교류협력 방안을 논의

## II. 출장일정

일정 (요일)	출발지	도착지	업무수행내용
11.23 (수)	인천	글래스고	(12:10) 인천출발 (21:35) 글래스고 도착
11.24 (목)			(09:00-17:00) University of Glasgow, Urban Big Data Centre 방문 - 빅데이터 기반 인공지능 도시계획 기술개발 주제발표 - 연구협력 및 공동연구 수행방안 논의
11.25 (금)	글래스고	런던	(12:10) 글래스고 출발 (14:15) 런던 도착
11.26 (토)			(09:00-17:00) University College London, Centre for Advanced Spatial Analysis 방문 - 빅데이터 기반 인공지능 도시계획 기술개발 주제발표 - 연구협력 및 공동연구 수행방안 논의
11.27 (일)			(09:00~17:00) 자료정리 및 회의준비
11.28 (월)	런던		(09:00-17:00) University College London, Centre for Advanced Spatial Analysis 방문 - 빅데이터 기반 인공지능 도시계획 기술개발 주제발표 - 연구협력 및 공동연구 수행방안 논의 (20:10) 런던 출발
11.29 (화)		인천	(17:45) 인천 도착

### III. 수행사항

#### 1. University of Glasgow, Urban Big Data Centre 방문 및 연구 협의

##### 1) 빅데이터 기반 인공지능 도시계획 기술개발 연구사업 주제 발표

- 국가 알앤디 연구개발 사업으로 수행중인 빅데이터 기반 인공지능 도시계획 기술개발 과제에 대한 소개 발표



## Research Overview

### ● Research Title: Development of Urban Planning Technology using Big Data and AI

### ● Period

- April 2022 - December 2026 (57 months), expected to be completed in 2026

### ● Research Grant

- Government funds 19,209 million KRW (approximately 15,000,000 USD)

(unit: million KRW)

	Total	'22	'23	'24	'25	'26
Amount	19,209	2,721	4,642	5,283	4,001	2,562

### ● Participating Institutes & Researchers

- 15 institutes & 178 participants in total (5 universities/68 participants, 3 government funded institutes/32 participants, 5 SMEs/71 participants, 2 local government funded institutes/7 participants)

### ● The achievements of this R&D project will belong to the state for public use

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## Research Background



● The advent of cutting-edge computing technologies such as big data and AI is leading our society and economic development.

● Big data and AI technology are used to solve socio-economic issues, and further to realize market innovation and national development. Urban planning is now required to actively find measures to utilize those technologies.

● The urban planning field needs to respond to various development demands and establish interactive urban plans, as well as set up and operate a system to evaluate previous plans.

● Based on these social backgrounds, this R&D project is to renew the existing urban planning process and its system through big data-based AI technology development.

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## Research Background

Category	AS-IS	TO-BE
Extend urban planning indicators	Example) Routinely distributing urban space demands after over-estimating population projections 	Example) Extend urban planning indicators based on evidence by using big data & AI 
Secure objectivity in urban management	Example) Gaps between urban planning and development 	Example) Secure practicality and objectivity in urban planning 
Secure measures to evaluate urban planning	Example) No evaluation measures for urban planning 	Example) Check the accomplishment rate of the plans by evaluating urban planning 

Currently, urban planning is conducted based on a qualitative analysis by individual local governments not capable of establishing urban planning on a scientific basis. However, establishing customized urban planning based on evidence and using big data and AI will bring higher practicality and build a positive relationship with future socio-scientific technology development. 4

## Research Vision

The first "official" and "nation-wide" introduction of big data and AI technology in urban planning



To realize interactive and smart city by objectifying and advancing urban planning

## Research Objectives & Achievements

Final Goal	Detailed Goal	Goal by stages					Achievements
Developing big data-based scientific & objective AI urban planning (concept & management plans) to respond to future social changes)	Technology Group 1 Developing big data-based urban diagnosis technology	STEP 1		STEP 2			Technology for utilizing & integrating urban big data
		2022 concept design	2023 Detail design & Initiating service platform development	2024 Completing service platform development	2025 Completing demonstration & Modifying service platform	2026 Improving platform operation & system	Urban diagnosis & outlook indicators
	Technology Group 2 Developing AI-based urban planning & supporting technology						Big data-based technology for urban diagnosis & outlook
							Technology to archive records of urban space & planning
							Supporting technology to establish big data & AI-based urban planning
							Technology to construct supporting systems for urban planning
							Urban planning monitoring system
	Technology Group 3 Developing technology to monitor urban changes & Conducting integrated demonstration	Developing basic technology & Constructing foundations		Developing applied technology & demonstration			Preparation demonstration & relevant systems of local governments

※ Three local governments to be demonstrated will be selected by inviting public participation in the 1<sup>st</sup> year

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## First-year Key Projects

### Developing big data-based urban diagnosis technology

- Research & concept (detail) design to build big data
- Algorithm concept (detail) design by diagnosis & outlook
- Concept (detail) design for urban diagnosis & outlook service system

### Developing AI-based urban planning & supporting technology

- Research & concept (detail) design to build DB for urban space and urban planning
- Algorithm concept (detail) design to establish and support big data & AI-based urban planning
- Concept (detail) design of supporting platform to establish urban planning

### Developing technology to monitor urban changes & Conducting demonstration

- Concept (detail) design for urban planning monitoring service and system
- Concept (detail) design to establish urban planning innovation framework
- Inviting public participation & appointing local governments for demonstration

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- Open platform using big data-based AI



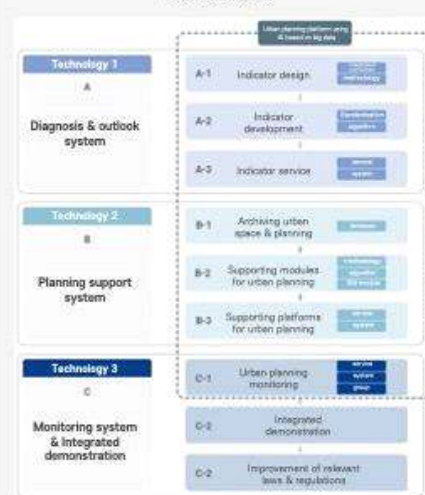
📍 The achievements of the R&D will be constructed as a cloud-based open platform (IaaS, SaaS, PaaS)\*

This will enable local governments and businesses to use the system and establish big data & AI-based urban planning at a minimum cost without building other systems



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### Main Research



### Implementation Institute & Roles





## Research Implementation Structure & Roles



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## Linkage and Cooperation Strategy

Build communication channels & systems for feedback among AI experts, urban planning engineers, governmental & industrial institutes (central & local governments, businesses)



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## 📍 Strategic Plan: Creating Soft Infrastructures

- **Project implementation & Schedule management based on WBS**
  - Build a linkage system for project implementation by using common forms and sharing schedules
- **Seminars for subjects, semi-annual workshops, annual result-sharing & evaluation meetings, etc.**
  - Seminars for subjects, semi-annual workshops (Jul. & Dec.), annual result-sharing & evaluation meetings (Sept. – Oct.)
- **Build communication channels & feedback systems to work with external experts**
  - Establish & operate a general advisory committee
- **Establish international cooperation networks to strengthen research capability & promote results**
  - Centre for Advanced Spatial Analysis (CASA), Urban Big Data Centre, City Futures Research Centre

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## 📍 Strategic Plan: Creating Hard Infrastructures

- **Build constant collaboration systems using contact-free communication channels & cloud services**
  - Entrustment contract with Naver's cloud platform in progress (legal review for a multi-year contract)
  - Equipped with functions of bulletin boards, material-sharing, etc.
- **Prepare systems to obtain & share big data for R&D by sectors**
  - Move to the 1-1 R&D section by reflecting evaluations
  - Purchase by negotiation (developing a business model for public-private cooperation after the completion of the project)

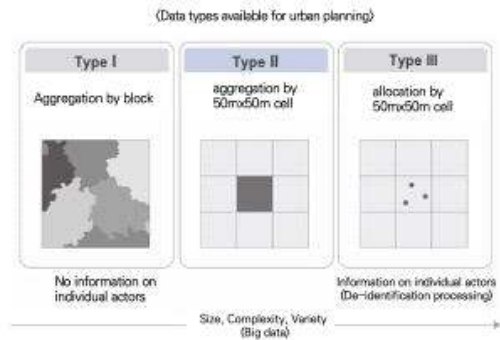


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## Data Searching & Securing Strategy

- Today's urban planning mostly uses statistical data as seen in "Type I" (not specific nor precise, limited in AI learning)
- This project will utilize big data such as "Type III" (more specific & precise, AI learning available).
- Besides existing population, this project will prioritize "public data" to develop it as urban planning indicators.
  - ※ Using and linking relevant system information including Korea Land use Information Platform (KLIP)
- "Private data" will be prioritized and purchased to be used, considering its necessity, usability, and sustainability.

※ Obtaining public data will be proceeded by the University of Seoul, and private data will be obtained by KRIHS



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## Data Searching & Securing Strategy

- Public data (Univ. of Seoul)

- Building shape information
- Administrative boundary information
- Road shape information
- Subway stations/routes
- shape information
- Building register information, etc.

[illegible]

\* No cost for obtaining data, but R&D cost is required for data processing and standardization

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## Data Searching & Securing Strategy

### Private data (Korea Research Institute for Human Settlements\*)

- Floating population
- Personal income
- Corporate information
- Credit cards
- Logistics, etc.



\* Conducted projects for big data platform & center building, big data flagship, big data policy development, data analysis technology planning & verification, data voucher, etc. of the Ministry of Science and ICT.

※ Private data is not purchased for single use. By establishing an eco-system and suggesting appropriate business models, it will be used constantly after the completion of this R&D project.

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## Expected Results

- The capability to conduct big data & AI-based urban planning and autonomous administration will drastically improve at the national level, contributing to establishing evidence-based urban planning
  - Control inefficient space uses such as over-development, unsold houses, and overly unexecuted facilities which were caused by the over-estimated population
- Contribute to establishing the Digital Platform Government, a core policy task of the new administration, by preparing an expandable, open urban planning platform
  - Integrate all ministries based on big data & AI technology and unify administrative service platforms



(Expected results of Expanding local governments)



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## Discussion

- **Scopes of collaboration**

- Knowledge sharing
- Development of methodology

- **Forms of collaboration**

- Seminar
- MOU
- Joint research

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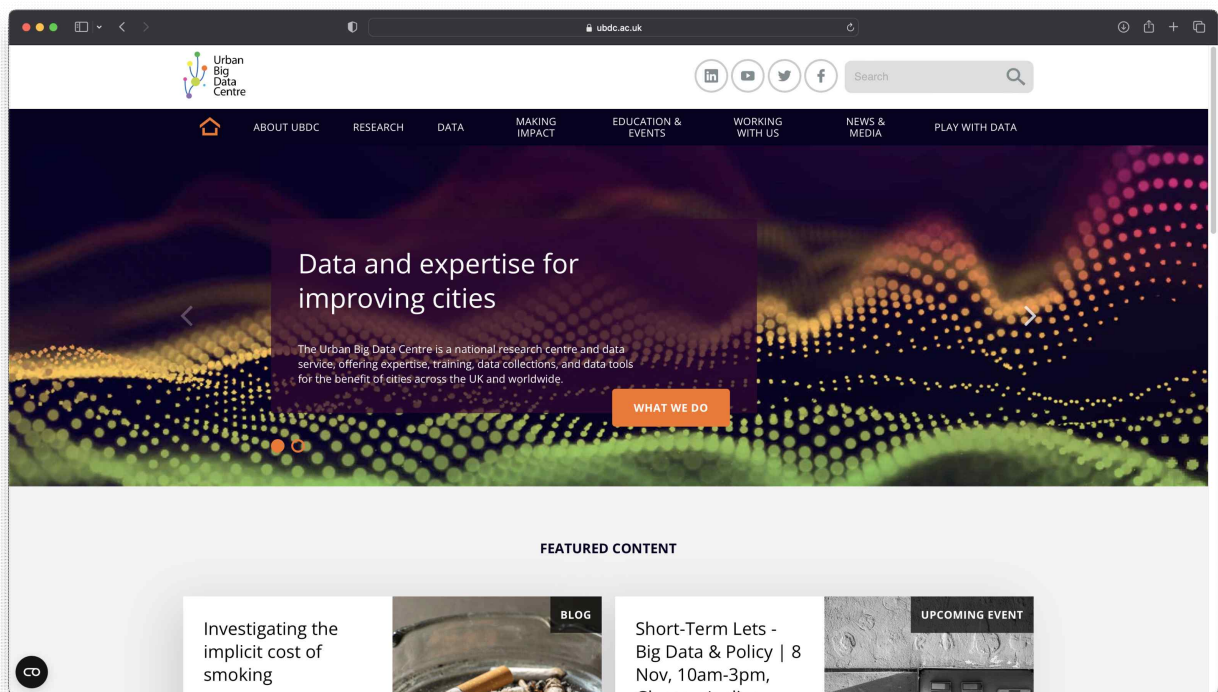
**Thank you!**

dhkim@krihs.re.kr



## 2) 글래스고 대학 빅데이터 센터 수행연구 청취

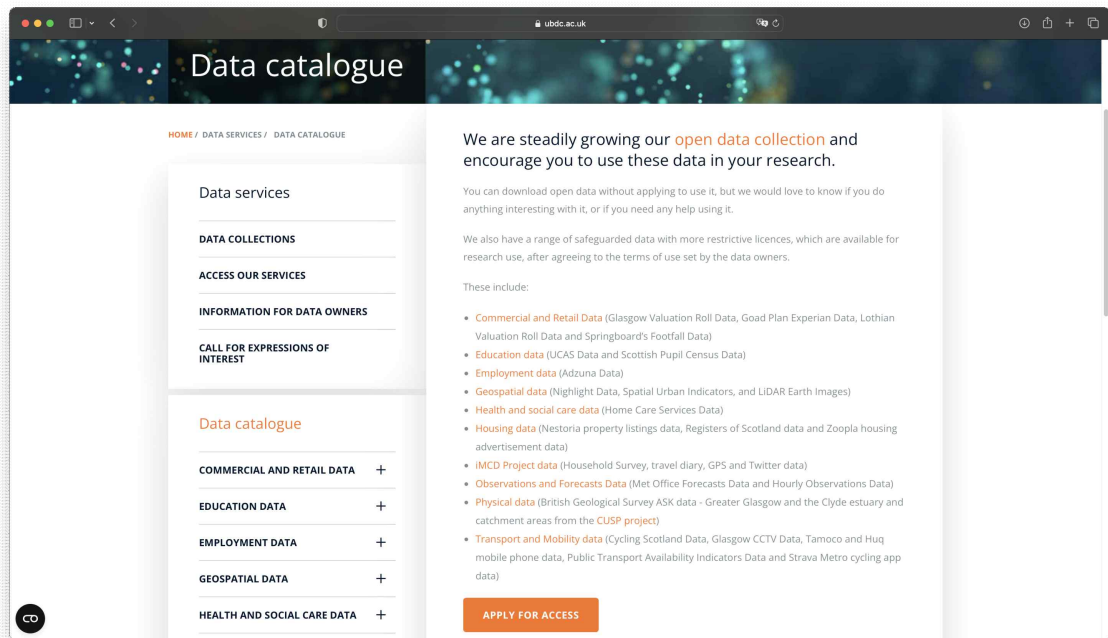
- UBDC(Urban Big Data Center)는 글래스고 대학교(University of Glasgow)에 기반을 둔 연구 센터이자 국가 데이터 서비스 센터 역할을 수행
- 도시의 사회적, 경제적, 환경적 웰빙을 개선하기 위해 빅데이터와 혁신적인 연구 방법의 개발과 전파를 수행
- UBDC는 2014년부터 영국의 연구혁신(UKRI) 산하 경제사회연구위원회(ESRC)와 글래스고 대학교의 공동 자금 지원을 받아 연구활동을 수행중



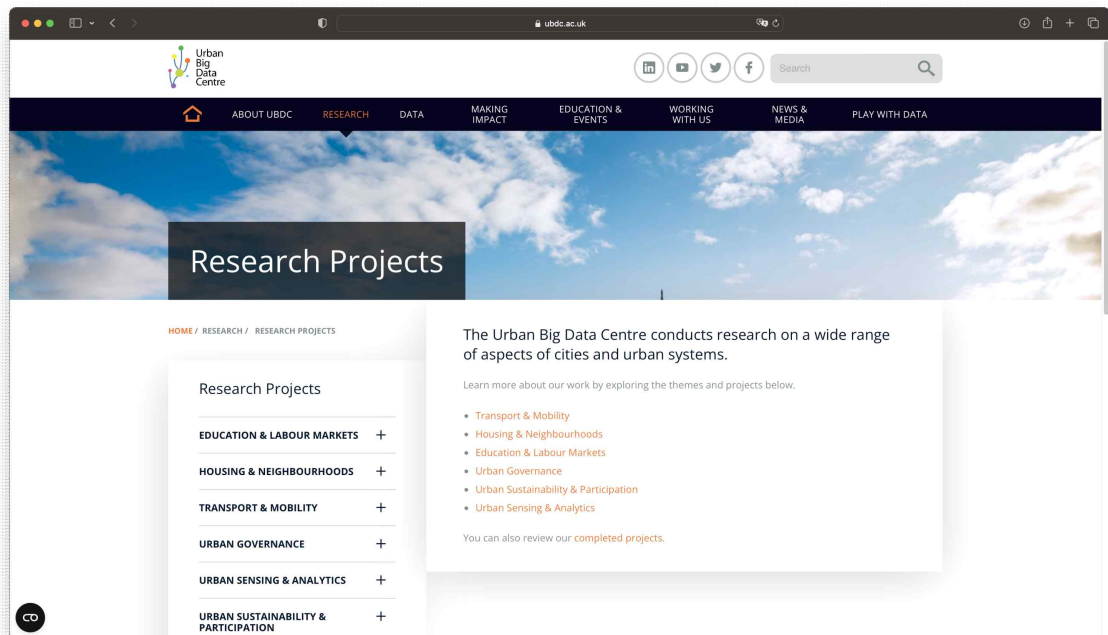
- 다양한 공공기관과 민간기업에서 생산한 빅데이터를 확보하여 사용자에게 공유하고 분석연구 결과를 창출하도록 장려
- 상업 및 소매 데이터(Glasgow 평가 롤 데이터, Goad Plan Experian



- 데이터, Lothian 평가 롤 데이터 및 Springboard의 발자취 데이터)
- 교육 데이터(UCAS 데이터 및 스코틀랜드 학생 인구 조사 데이터)
  - 고용 데이터(Adzuna 데이터)
  - 지리 공간 데이터(야간 데이터, 공간 도시 표시기 및 LiDAR 지구 이미지)
  - 건강 및 사회 복지 데이터(홈 케어 서비스 데이터)
  - 주택 데이터(Nestoria 부동산 목록 데이터, Registers of Scotland 데이터 및 Zoopla 주택 광고 데이터)
  - iMCD 프로젝트 데이터(가계조사, 여행 일기, GPS 및 Twitter 데이터)
  - 관측 및 예측 데이터(기상청 예측 데이터 및 시간별 관측 데이터)
  - 물리적 데이터(British Geological Survey ASK 데이터 - CUSP 프로젝트의 Greater Glasgow 및 Clyde 하구 및 집수 지역)
  - 교통 및 이동성 데이터(Cycling Scotland 데이터, Glasgow CCTV 데이터, Tamoco 및 Huq 휴대폰 데이터, 대중 교통 가용성 지표 데이터 및 Strava Metro 사이클링 앱 데이터)



- 수집된 빅데이터를 활용하여 도시공간의 다양한 문제를 해결하는데 기여하는 연구를 수행중
  - 운송 및 이동성
  - 주택 및 지역 네이버후드
  - 교육 및 노동 시장
  - 도시 거버넌스
  - 도시 지속 가능성 및 참여
  - 도시 감지 및 분석



### 3) 상호협력 방안 논의

○ 빅데이터 기반 인공지능 도시계획 기술개발 과제는 국가적 차원에서 도시계획 분야의 혁신을 위해 추진하는 연구개발 사업이며, 글래스고 대학의 빅데이터 센터도 유사한 주제분야에 대해서 다양한 연구를 수행하고 있는 만큼 다양한 방법을 통해서 상호협력을 추진하기로 논의

- 세미나
- MOU
- 공동연구 수행 등

## <어반 빅데이터 센터 주요 시설 및 수행 연구>



# Effects of residential location and mobile technologies on trip generation: Focusing on mediating effects

Jinhyun Hong, University of Glasgow, Piyushmita (Vonu) Thakuriah, University of Glasgow



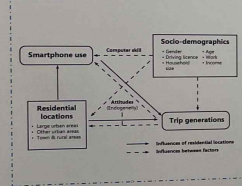
## 1. Background

- Smartphones have become fully integrated into our daily lives and allow people to have ubiquitous access to the Internet
- In addition, diverse functions embedded in the smartphone have great potential to change people's activities and travel behaviour
- However, few studies have examined the potential effects of smartphone use on travel behaviour
- In addition, some studies have provided evidence about digital divide (e.g. urban vs. rural areas)
- This study examines the complex relationship between residential location, smartphone use and trip generation. Specifically, the direct and indirect effects of residential location on trip generation through smartphone use are investigated while considering potential endogeneity impacts between them

## 2. Research questions

- How are different types of residential location (i.e., large urban, other urban and town & rural areas) associated with smartphone use to access the Internet?
- How do residential location and smartphone use influence the trip frequencies of auto, public transport and active travel?

## 3. Framework



## 4. Data and variables

- Integrated Multimedia City Data (IMCD) survey sponsored by the Urban Big Data Centre (UBDC) at the University of Glasgow

### 4.1. Key variables

- Dependent variables**
  - Smartphone use to access the Internet (yes=1)
  - Three trip frequencies (i.e., auto, private car and taxi, public transport, bus, train and underground, and active travel: walking and cycling) from travel diary
- Independent variables**
  - Socio-demographics (SD): Age, gender, income, household size, etc.
  - Smartphone use to access the Internet
  - Attitudes towards transport modes (For me, walking/public transport/cycling for regular or daily journeys is something like): Strongly disagree - Strongly agree
  - Computer skill (How confident the person is in using computer problems such as network issues, as well as in online activities such as making online profiles and uploading videos): Not at all confident - Very confident
  - Residential location: Large urban, other urban and town & rural areas (based on population levels and the distance from a place with a settlement of 10,000 or more people)

## 5. Model

- Two stage approach (1<sup>st</sup> stage: smartphone use - Probit model; 2<sup>nd</sup> stage: trip generation - Poisson model)
- Maximum likelihood technique with a covariance matrix

$$P_i = \frac{1}{1 + \exp(-\beta_0 - \beta_1 \text{Age}_i - \beta_2 \text{Gender}_i - \beta_3 \text{Income}_i - \beta_4 \text{HouseholdSize}_i - \beta_5 \text{Location}_i)}$$

- $\beta$  and  $\sigma$  are normally distributed with mean 0 and covariance matrix as follows

## 6. Results

	Smartphone use	Auto	Public transport	Active travel
Intercept	1.25	1.15	1.15	1.15
Age	-0.01	-0.01	-0.01	-0.01
Gender	0.01	0.01	0.01	0.01
Income	0.01	0.01	0.01	0.01
Household size	0.01	0.01	0.01	0.01
Location	0.01	0.01	0.01	0.01
Computer skill	0.01	0.01	0.01	0.01
Attitudes	0.01	0.01	0.01	0.01
Smartphone use		0.01	0.01	0.01
Constant		1.15	1.15	1.15
$\sigma^2$		1.15	1.15	1.15
$\chi^2$		1.15	1.15	1.15
$\Delta$ likelihood ratio test (p = 0.1)		1.15	1.15	1.15

## 7. Conclusion

- Even though the association is marginally significant, people living in large urban areas are more likely to use their smartphones to access the Internet than those residing in town or rural areas
- There is a significant consistency impact of smartphone use on auto trip generation
- Residential location is an important determinant of different types of trip generation. People residing in large or other urban areas tend to make fewer car journeys compared to those living in town or rural areas. In addition, residents in large urban areas are more likely to generate public transport and active travel trips, supporting the effectiveness of urban growth management strategies
- We identify the potential indirect impacts of residential location on auto trip generation through smartphone use, ignoring the mediated impacts of residential location could result in the over-estimated influences of residential location on travel behaviour

# Social Activity Understanding Using Images to Assess Social Life



## MOTIVATION

What do images captured by people say about their social life?  
Need to quantify the social activity  
Identify groups of people with similar social behaviour

## DATA

170 participants  
463,459 images

## METHODOLOGY

### Face Detection

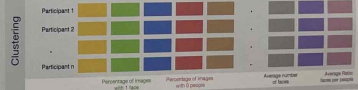
CNN model from dlib  
Facial CNN network with 27 convolutional layers

### Person Detection

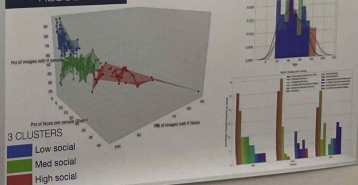
CNN model from TensorFlow  
Faster R-CNN with ResNet

### Object Detection

Clustering



## RESULTS



## 2. University College London, Centre for Advanced Spatial Analysis

### 1) 빅데이터 기반 인공지능 도시계획 기술개발 연구사업 주제 발표

- 국가 알앤디 연구개발 사업으로 수행중인 빅데이터 기반 인공지능 도시계획 기술개발 과제에 대한 소개 발표





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● Big data and AI technology are used to solve socio-economic issues, and further to realize market innovation and national development. Urban planning is now required to actively find measures to utilize those technologies.

● The urban planning field needs to respond to various development demands and establish interactive urban plans, as well as set up and operate a system to evaluate previous plans.

● Based on these social backgrounds, this R&D project is to renew the existing urban planning process and its system through big data-based AI technology development.

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## Research Background

Category	AS-IS	TO-BE
Extend urban planning indicators	Example) Routinely distributing urban space demands after over-estimating population projections 	Example) Extend urban planning indicators based on evidence by using big data & AI 
Secure objectivity in urban management	Example) Gaps between urban planning and development 	Example) Secure practicality and objectivity in urban planning 
Secure measures to evaluate urban planning	Example) No evaluation measures for urban planning 	Example) Check the accomplishment rate of the plans by evaluating urban planning 

Currently, urban planning is conducted based on a qualitative analysis by individual local governments not capable of establishing urban planning on a scientific basis. However, establishing customized urban planning based on evidence and using big data and AI will bring higher practicality and build a positive relationship with future socio-scientific technology development. 4

## Research Vision

The first "official" and "nation-wide" introduction of big data and AI technology in urban planning



To realize interactive and smart city by objectifying and advancing urban planning

## Research Objectives & Achievements

Final Goal	Detailed Goal	Goal by stages					Achievements
Developing big data-based scientific & objective AI urban planning (concept & management plans) to respond to future social changes)	Technology Group 1 Developing big data-based urban diagnosis technology	STEP 1		STEP 2			Technology for utilizing & integrating urban big data
	Technology Group 2 Developing AI-based urban planning & supporting technology	2022 concept design	2023 Detail design & Initiating service platform development	2024 Completing service platform development	2025 Completing demonstration & Modifying service platform	2026 Improving platform operation & system	Urban diagnosis & outlook indicators
							Big data-based technology for urban diagnosis & outlook
							Technology to archive records of urban space & planning
							Supporting technology to establish big data & AI-based urban planning
	Technology Group 3 Developing technology to monitor urban changes & Conducting integrated demonstration	Developing basic technology & Constructing foundations		Developing applied technology & demonstration			Technology to construct supporting systems for urban planning
					Urban planning monitoring system		
					Preparation demonstration & relevant systems of local governments		

※ Three local governments to be demonstrated will be selected by inviting public participation in the 1<sup>st</sup> year

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## First-year Key Projects

### Developing big data-based urban diagnosis technology

- Research & concept (detail) design to build big data
- Algorithm concept (detail) design by diagnosis & outlook
- Concept (detail) design for urban diagnosis & outlook service system

### Developing AI-based urban planning & supporting technology

- Research & concept (detail) design to build DB for urban space and urban planning
- Algorithm concept (detail) design to establish and support big data & AI-based urban planning
- Concept (detail) design of supporting platform to establish urban planning

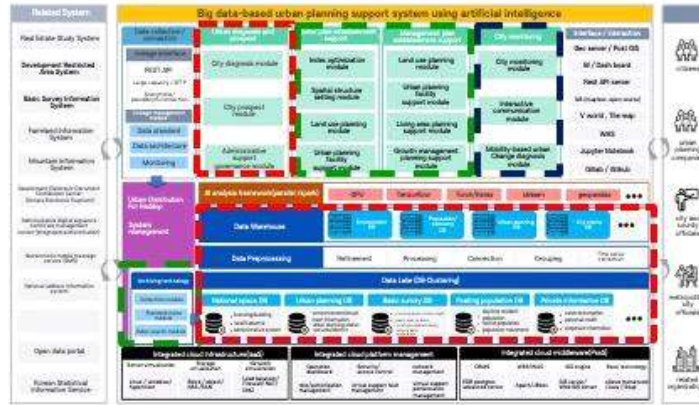
### Developing technology to monitor urban changes & Conducting demonstration

- Concept (detail) design for urban planning monitoring service and system
- Concept (detail) design to establish urban planning innovation framework
- Inviting public participation & appointing local governments for demonstration

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## Target System Architecture (plan)

- Open platform using big data-based AI



The achievements of the R&D will be constructed as a cloud-based open platform (IaaS, SaaS, PaaS)\*

This will enable local governments and businesses to use the system and establish big data & AI-based urban planning at a minimum cost without building other systems

- Technology Group 1
- Technology Group 2
- Technology Group 3

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## Implementation Structure & Roles



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## Research Implementation Structure & Roles



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## Linkage and Cooperation Strategy

Build communication channels & systems for feedback among AI experts, urban planning engineers, governmental & industrial institutes (central & local governments, businesses)



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## 📍 Strategic Plan: Creating Soft Infrastructures

- **Project implementation & Schedule management based on WBS**
  - Build a linkage system for project implementation by using common forms and sharing schedules
- **Seminars for subjects, semi-annual workshops, annual result-sharing & evaluation meetings, etc.**
  - Seminars for subjects, semi-annual workshops (Jul. & Dec.), annual result-sharing & evaluation meetings (Sept. – Oct.)
- **Build communication channels & feedback systems to work with external experts**
  - Establish & operate a general advisory committee
- **Establish international cooperation networks to strengthen research capability & promote results**
  - Centre for Advanced Spatial Analysis (CASA), Urban Big Data Centre, City Futures Research Centre

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## 📍 Strategic Plan: Creating Hard Infrastructures

- **Build constant collaboration systems using contact-free communication channels & cloud services**
  - Entrustment contract with Naver's cloud platform in progress (legal review for a multi-year contract)
  - Equipped with functions of bulletin boards, material-sharing, etc.
- **Prepare systems to obtain & share big data for R&D by sectors**
  - Move to the 1-1 R&D section by reflecting evaluations
  - Purchase by negotiation (developing a business model for public-private cooperation after the completion of the project)



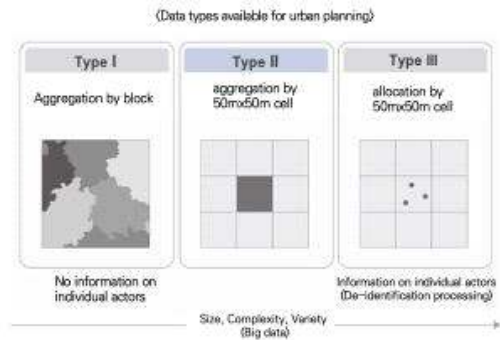
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## Data Searching & Securing Strategy

- Today's urban planning mostly uses statistical data as seen in "Type I" (not specific nor precise, limited in AI learning)
- This project will utilize big data such as "Type III" (more specific & precise, AI learning available).
- Besides existing population, this project will prioritize "public data" to develop it as urban planning indicators.
  - ※ Using and linking relevant system information including Korea Land use Information Platform (KLIP)
- "Private data" will be prioritized and purchased to be used, considering its necessity, usability, and sustainability.

※ Obtaining public data will be proceeded by the University of Seoul, and private data will be obtained by KRIHS



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## Data Searching & Securing Strategy

- Public data (Univ. of Seoul)

- Building shape information
- Administrative boundary information
- Road shape information
- Subway stations/routes
- shape information
- Building register information, etc.

[illegible]

\* No cost for obtaining data, but R&D cost is required for data processing and standardization

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## Data Searching & Securing Strategy

### Private data (Korea Research Institute for Human Settlements\*)

- Floating population
- Personal income
- Corporate information
- Credit cards
- Logistics, etc.



\* Conducted projects for big data platform & center building, big data flagship, big data policy development, data analysis technology planning & verification, data voucher, etc. of the Ministry of Science and ICT.

※ Private data is not purchased for single use. By establishing an eco-system and suggesting appropriate business models, it will be used constantly after the completion of this R&D project.

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## Expected Results

- The capability to conduct big data & AI-based urban planning and autonomous administration will drastically improve at the national level, contributing to establishing evidence-based urban planning
  - Control inefficient space uses such as over-development, unsold houses, and overly unexecuted facilities which were caused by the over-estimated population
- Contribute to establishing the Digital Platform Government, a core policy task of the new administration, by preparing an expandable, open urban planning platform
  - Integrate all ministries based on big data & AI technology and unify administrative service platforms



(Expected results of Expanding local governments)



(Digital Platform Government)

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## Discussion

- **Scopes of collaboration**

- Knowledge sharing
- Development of methodology

- **Forms of collaboration**

- Seminar
- MOU
- Joint research

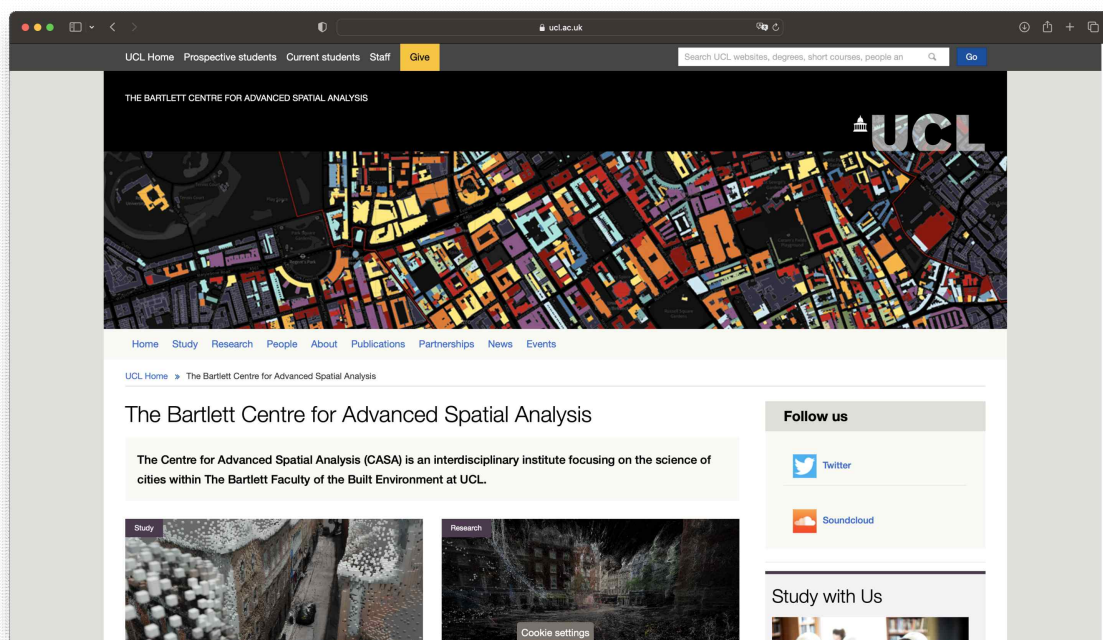
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**Thank you!**

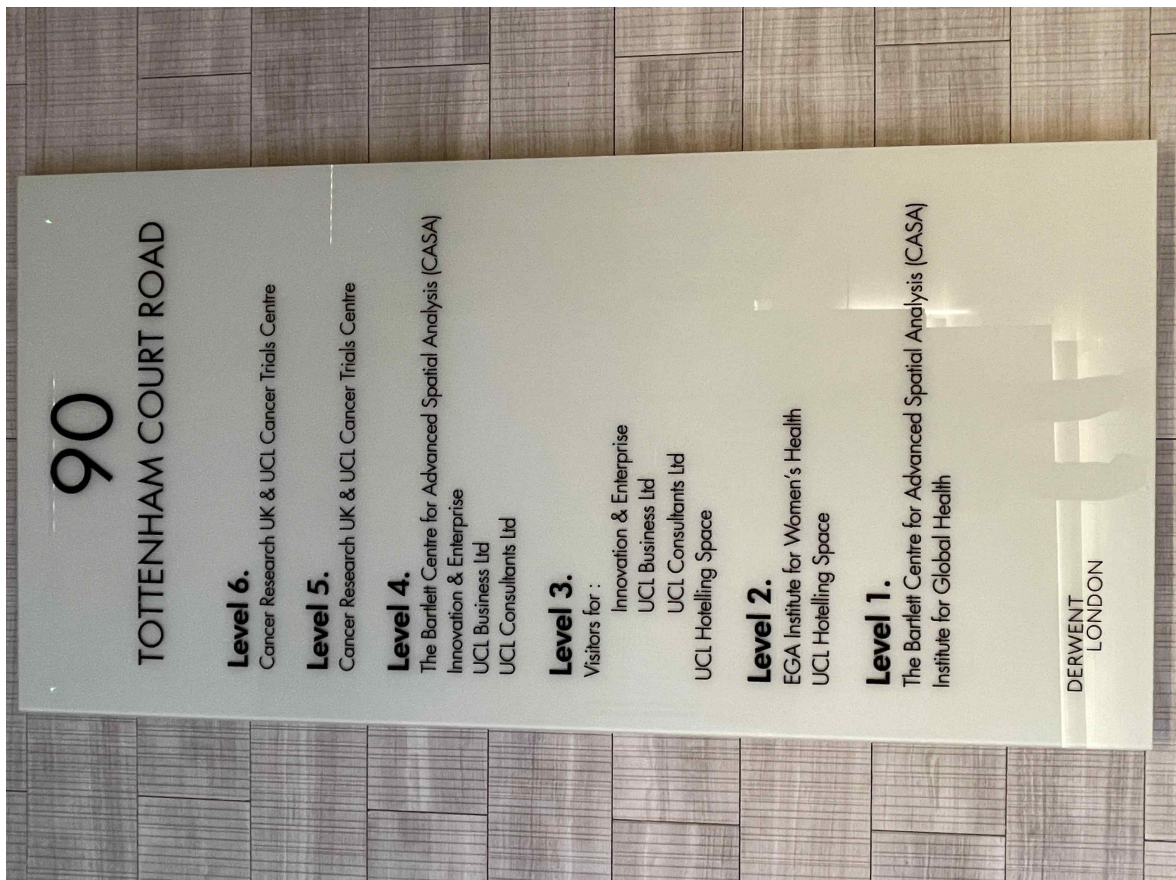
dhkim@krihs.re.kr

## 2) 런던대학 첨단공간분석 센터 수행연구 청취

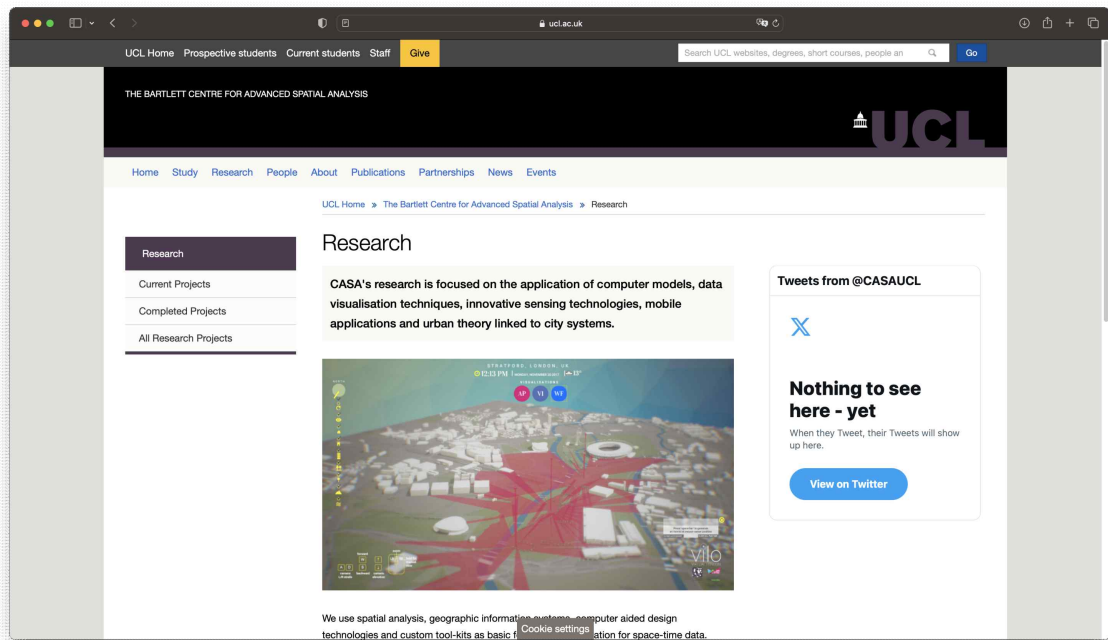
- CASA(Centre for Advanced Spatial Analysis)는 모델링, 도시 환경 감지, 시각화 및 연산에 다양한 연구방법과 아이디어를 활용하여 도시 과학의 발전을 주도하기 위한 목표를 가지고 1995년에 설립
- 모든 도시가 공유하는 자원 효율성과 효과적인 계획 및 거버넌스 문제를 조사하고 솔루션을 제공하고자 함과 동시에, 스마트 시티 과학에서 중심적인 역할을 하고 이를 도시 계획, 정책 및 건축에 적용하여 도시를 더 살기 좋은 곳으로 만드는 것을 지향하고 있음
- 다양한 학문 분야의 폭넓은 전문 지식과 도시의 공통 도메인 지식을 갖춘 학자들이 함께 모여서 연구개발을 진행중







- CASA의 연구는 컴퓨터 모델, 데이터 시각화 기술, 혁신적인 감지 기술, 모바일 애플리케이션 및 도시 시스템과 연결된 도시 이론의 응용에 중점을 두고 있음
- 공간 분석, 지리 정보 시스템, 컴퓨터 지원 설계 기술 및 맞춤형 툴킷을 시공간 데이터 표현의 기본 형태로 사용하고 있으며,
- 사회 물리학, 계량경제학 및 통계 모델 확장, 증강 현실 및 초지역 감지부터 클라우드 소싱에 이르기까지 광범위한 방법을 통해 연구를 진행
- 이를 통해 여러 분야에 걸쳐 시뮬레이션 모델을 구축하고, '빅데이터'를 시각화하고, 맞춤형 애플리케이션을 개발하고, 데이터 수집, 분석 및 통신을 위한 새로운 방법을 만들고 있음



### 3) 상호협력 방안 논의

- 빅데이터 기반 인공지능 도시계획 기술개발 과제는 국가적 차원에서 도시계획 분야의 혁신을 위해 추진하는 연구개발 사업이며, 런던 대학의 첨단공간분석 센터도 유사한 주제분야에 대해서 다양한 연구를 수행하고 있는 만큼 다양한 방법을 통해서 상호협력을 추진하기로 논의
- 세미나
- MOU
- 공동연구 수행 등



### 3. 종합 시사점

- 클래스고 대학의 어반 빅데이터 센터는 다양한 공공과 민간의 데이터를 체계적으로 수집하여 국가적 차원에서 이를 공유하여 도시분석 관점에서 연구개발을 직접 수행함과 동시에 간접적으로도 장려하는 특징을 가지고 있음
- 중장기적인 자원 확보와 함께 다양한 관계자들의 파트너십 형성이 핵심적인 요소로 판단하고 있었음
- 빅데이터 기반 인공지능 도시계획 기술개발의 성공적 추진을 위해서는 다양한 빅데이터의 연계, 공유, 통합, 활용체계 구축이 필요함을 알 수 있으며, 관련된 노하우를 서로 공유하기로 함
- 런던 대학의 첨단공간분석 연구센터는 새로운 분석방법과 분석모형의 개발에 중점을 두고 다양한 연구를 수행중임
- 다양한 분과학문의 전문가와의 협업과 도전과 혁신을 통한 도시공간의 발전을 도모하고 있음
- 빅데이터 기반 인공지능 도시계획 기술개발의 성공적 추진을 위해서는 새로운 방법론의 개발과 이를 실증적용하여 도시공간을 혁신하는 것이 필요함을 알 수 있으며, 상호협력을 통해 지식과 경험을 공유하기로 함