# Smart City Data Hub

## A smart city data hub is a big data management technology that collects, stores, processes, and analyzes urban data from various systems related to urban infrastructure, supporting its utilization.

By applying the data integration standard (NGSI-LD) API, it integrates and manages heterogeneous data, supports the implementation of convergent services, and facilitates data sharing and dissemination among local governments.



Emergency prediction, emergency rescue, facility management

Smart mobility, smart parking

Smart grid, building energy management

Particulate matter prediction, smart water management

Support for the elderly living alone and the disabled

Digital marketmanagement

▲ Various smart city infrastructures and platforms are integrated into the smart city data hub.

### Issues to Tackle

☑ Lack of an integrated management system for data collected from various smart infrastructures within the city.

☑ Growing need for data analysis-based prevention of safety accidents and disasters.

### Expected Benefits ☑

☑ Establishing an integration system between heterogeneous data through the application of standard interfaces.

☑ Developing a data-driven city problem-solving and decision-making support system.

☑ Integrating and managing urban data centered around metropolitan local governments, with expanding services at the neighborhood level.

☑ Enhancing citizens' quality of life through expanding data analysis and prediction services.
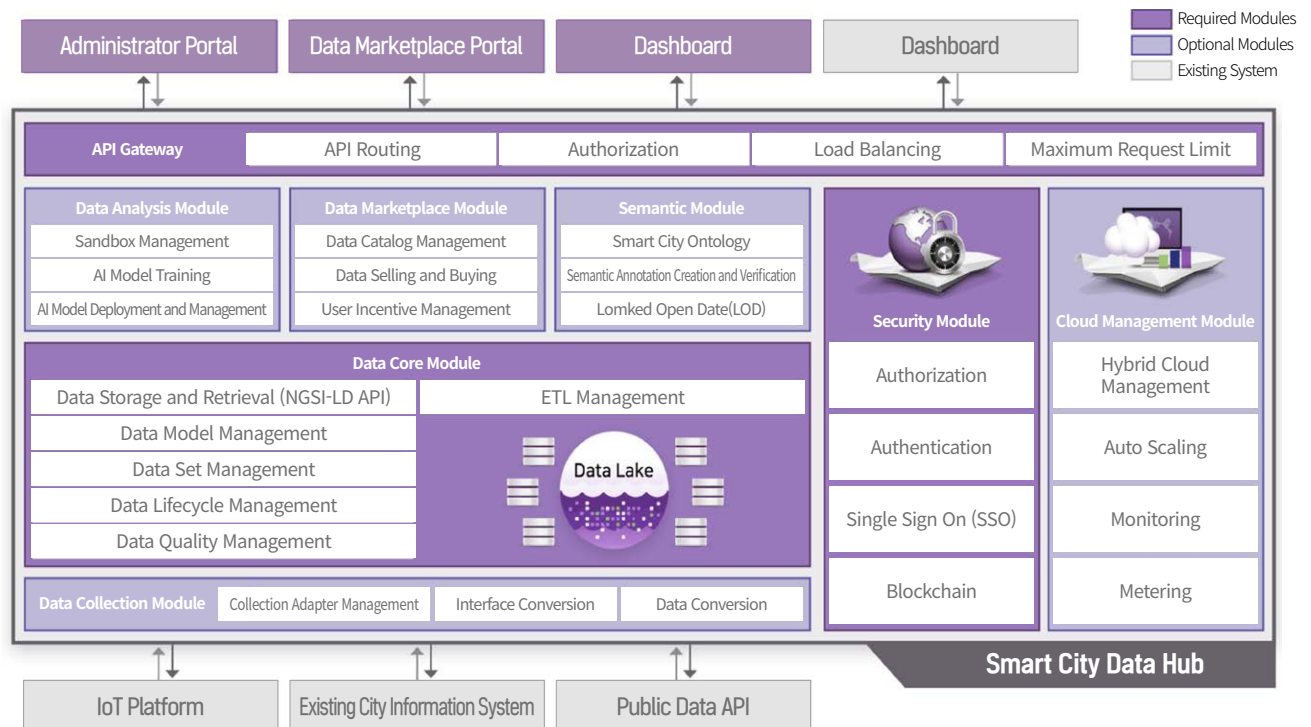
### ⚡ Key Services

· Integrating urban data infrastructures for unified management and utilization of city data.

· Supporting standard interfaces and data models (NGSI-LD interface standard).

· Utilizing the smart city common data model for providing convergent services.

### ⚙ Use Cases

· After the demonstration operation in Daegu Metropolitan City and Siheung-si, Gyeonggi-do, using the open source developed through R&D from 2018 to 2022, the 'Smart City Data Hub' will be spread and distributed to 17 local governments.

· Incheon Metropolitan City uses it for the task of selecting the optimal location for smart transportation and safety facilities.

· Chungcheongnam-do analyzes fire reporting information and data on fire-related facilities and applies it to emergency rescue tasks.

· Jeju Special Self-Governing Province uses it for the task of analyzing areas with frequent PM safety accidents and applying variable operating speeds in traffic-vulnerable protection zones.

## Key Components

### Configuration



| | | | |
|---|---|---|---|
| Administrator Portal | Data Marketplace Portal | Dashboard | Dashboard |

**Required Modules / Optional Modules / Existing System**

**API Gateway** | API Routing | Authorization | Load Balancing | Maximum Request Limit

**Data Analysis Module**
- Sandbox Management
- AI Model Training
- AI Model Deployment and Management

**Data Marketplace Module**
- Data Catalog Management
- Data Selling and Buying
- User Incentive Management

**Semantic Module**
- Smart City Ontology
- Semantic Annotation Creation and Verification
- Lomked Open Date(LOD)

**Security Module**
- Authorization
- Authentication
- Single Sign On (SSO)
- Blockchain

**Cloud Management Module**
- Hybrid Cloud Management
- Auto Scaling
- Monitoring
- Metering

**Data Core Module**
- Data Storage and Retrieval (NGSI-LD API)
- ETL Management
- Data Model Management
- Data Set Management
- Data Lifecycle Management
- Data Quality Management

Data Lake

**Data Collection Module** | Collection Adapter Management | Interface Conversion | Data Conversion

**Smart City Data Hub**

| | | |
|---|---|---|
| IoT Platform | Existing City Information System | Public Data API |

### Technology

**1. Data core module**
· Data model, data set, data flow, lifecycle, management and data storage/viewing functions, various data repositories.

**2. Data collection module**
· Protocol conversion adapter that collects city infrastructure data such as IoT platform, OPEN API, and smart city integrated platform.

**3. Data analysis module**
· Data preprocessing, machine learning model creation/ verification, and displacement management functions.

**4. Security module (authentication/authorization)**
· Security Gateway-linked token-based integrated authentication/authorization function.

**5. API gateway**
· Providing functions such as API routing, external request limit, secure communication, and token verification.

**6. Cloud analytics development and operating environment technology**
· Allocating computing resources to meet user needs and installing software to analyze the retrieved data or develop services.

**7. Integration with the integrated platform**
· Standardizing the urban safety data model of the smart city integrated platform and using it as the basic data of the data hub.

POINT CCTV installation information, police, firefight report information, etc.

### Technology Companies

**DITONIC**
www.dtonic.io

**EDEN TNS**
www.edentns.com

**KT**
www.kt.com

**LG CNS**
www.lgcns.com

**NEIGHBOR SYSTEM**
www.neighbor21.co.kr

**SMART CITY ASSOCIATION**
www.smartcity.or.kr