TRANSFORMATIVE • TAIPEI

SMART • TAIPEI

TECH • TAIPEI

BUILD • TAIPEI

DYNAMIC • TAIPEI

LIVABLE • TAIPEI

HEALTHY • TAIPEI

MAKER • TAIPEI

CONVENIENT • TAIPEI

UNLIMITED • TAIPEI

OPEN • TAIPEI

GO SMART • TAIPEI

CITY OF GLORY • TAIPEI

TRANSFORMATIVE TAIPEI

Smart City Projects Are Being Implemented Across Taipei, Transforming It into a Truly Smart City.

CONTENTS

TRANSFORMATIVE • TAIPEI 3
INNOVATIVE • TAIPEI 4
SMART • TAIPEI 6
TECH • TAIPEI 8
BUILD • TAIPEI 9
DYNAMIC • TAIPEI 10
LIVABLE • TAIPEI 14
HEALTHY • TAIPEI 16
MAKER • TAIPEI 18
CONVENIENT • TAIPEI 20
UNLIMITED • TAIPEI 22
OPEN • TAIPEI 26
GO SMART • TAIPEI 28
CITY OF GLORY • TAIPEI 30
Taipei City is the capital of Taiwan with excellent information infrastructure, plenty of industry, government, academic and research resources, convenient transportation network, complete industry chain, and distinguished human resources. These features offer excellent nourishment for city constructions, tech companies, and innovation teams.

Apart from the advantages in hardware, information and communication technology, and talent pool, Taipei City hosted the “World Design City” in 2016, after being selected as the event’s host based on its appeal of “Adaptive City.” In 2017, Taipei City hosted “Summer Universiade” and “World Congress on Information Technology” as well as other high-profile global events, exhibiting its solid urban resilience and international vigor.

To continue building Taipei City into a livable city which can become a source of pride for its citizens, Taipei City Government declared “Open Government”, “Citizen Participation”, and “Public-Private Partnership” as its core visions in developing a smart solution-based ecosystem. In the meantime, Taipei City also adopts a sandbox approach – which allows room for failures – to encourage innovators to utilize Taipei City as their demonstration site, helping them to speed up the development of various solutions and providing citizens with excellent living environment.
Taipei City Government Department of Information Technology (DoIT) established Taipei Smart City Project Management Office (TPMO) in 2016 to assist the development of smart city, encourage industry innovations, and strengthen public-private partnership to transform the culture of city government. Taipei City Government offers itself as a platform for opening up the city as a living lab, through the constant injection of innovative energy, the living quality of citizens has greatly improved.

Taipei promotes smart city by focusing on three core mechanisms: Top-down, Bottom-up and Citizen Participation.

**Top-down:** DoIT and TPMO follow the policies and directives of Taipei City Government, assisting and matching government agencies with relevant industries by proposing mature solutions. Some examples of such joint efforts include Smart Taipei Main Station, 3U Green and Shared Transportation and Smart Public Housing.

**Bottom-up:** Taipei City launched the first cooperation model “Taipei Smart City Industrial Field Pilot Program” in Taiwan, where private-sector companies propose ideas to DoIT and TPMO for evaluation and administrative coordination before conducting experiments to test their solutions at Taipei City sites.

Finally, the most important mechanism is Citizen Participation. Through participatory budgeting project, i-Voting system, workshops, and open data, citizens have different channels to be part of the policy decision making process with mechanisms for input and feedback.

**MECHANISM OF SMART TAIPEI**

1. Contacted 300+ ICT Vendors & Research Institutions
2. Collaborated with 20 Taipei City Government Agencies
3. Involved 30,000+ Citizens through Public Participation Events
4. Initiate 130+ Smart City PoC Projects

A new model integrating Top-down and Bottom-up mechanisms has been derived for operating smart city projects. The “Taipei City Hospital Smart Ward Pilot Program” is the one of the examples that adds the element of Bottom-up mechanism with Top-down policy plan.
Comprehensive Information Infrastructure

1. Integrated Internet Service
Taipei City Government has established Taipei Free WiFi service since 2011. It is the first city in Taiwan to provide public free WiFi access, with the number of users once reaching nearly 4 million. In order to advance the WiFi service, Taipei City Government launched the "Taipei WiFi Alliance" in 2015. Through the integration of broadband infrastructure resources from the government, industry, and academia, members will be able to enjoy better WiFi connections. Since 2017, Taipei Rapid Transit Corporation offers WiFi services on MRT trains for free, with the private sector partners offering a 5-year-long maintenance and operation support.

In addition to the WiFi service, Taipei City Government also constructed a LoRa Experimental Platform which encouraged the creation of many innovative public service applications. Examples of the applications include: tracker for locating children, seniors or pets, as well as sensors for detecting the open parking space, and soil or water quality.

2. Information Security Protection System
Taipei City Government not only maintains basic protection management on agency information and internet environment safety but also seeks to work with local information security industries proactively. On one hand, this approach can make up for demand of city government information security; on the other hand, it can boost the number of information security solutions in Taiwan and improve their competitiveness in the international market.

3. Road Pipeline Smart Management
Taipei City Road & Pipeline Information Center (RPIC) has pioneered the integration of resources to establish a 3D map of pipelines and carried out the relocation of elevated cable under the ground. Such integration is expected to reduce road excavation and substantially reduce the administrative costs derived from "repeated excavation." In the future, the public can monitor construction status via mobile phone at any time.

4. Smart Street Light
Taipei City proactively deploys Smart Street Light in various regions of the city to promote different smart applications, hoping the common street light network will become a powerful IoT platform. In particular, DoIT implemented the Neihu District Smart Street Light Demonstration plant by setting up 12 street lights with successful introduction of smart lighting, safe warning, calculation of traffic flow and crowds, detection of empty parking space, environmental sensor and digital signage information broadcasting as well as other functions. This project was nominated for the "Project Award" in World Smart City Awards during the 2017 Smart City Expo World Congress in Barcelona, Spain.

Taipei City adopts "5+N" as the scheme for smart city development. The "5" indicates five key areas that are closely related to citizens' life which includes: Smart Transportation, Smart Public Housing, Smart Health Care, Smart Education, Smart Payment and Cyber Security. And "N" stands for Innovation, which is an important DNA to city development and hence Taipei City Government initiates to open the entire city as the demonstration site for innovations.
Citizens can rent electric mopeds to travel via mobile APP. The backend operation team working with Taipei City Government can monitor the status of fleet utilization at any time and instantly check battery conditions. Currently, there are 1,000 electric mopeds available for hire in Taipei City.

Taipei City has set up 128 charging stations for electric car in 78 public parking lots, creating an electric-car friendly city environment. Citizens can directly use the smartphone APP to hire a vehicle for one-way rental service. Right now, the furthest an electric car can travel without recharging is roughly 250 kilometers. In the future, Taipei City will negotiate with adjacent cities to jointly build an electric-car friendly environment and expand the 3U capital living circle.

Taipei City Government joined forces with a local bike company to develop the bike-sharing system. Currently there are 400 rental stations with over 13,000 bikes services around the clock.

1. Autonomous Vehicle Testing Field
Taipei City cooperated with the private sector in August 2017 and completed the autonomous bus test for 5 days with success. In 2018, Taipei City turned a 10-hectare site at Shihlin Beitou Science Park into the first autonomous vehicle testing field in Taiwan, offering space for technology tests related to Internet of Vehicles, autonomous vehicle and smart infrastructure. In the future, Taipei City Government will be the first to introduce small autonomous bus on designated bus lanes on Xinyi Road as the "first mile" and "last mile" connections for MRT stations, providing citizens with more diverse and convenient choices of public transportation.

2. 3U Green Shared Transportation
To promote concepts of sharing and green economy, Taipei City is committed to building a 3U capital living circle. Apart from the current Youbike and U-Motor services, Taipei City will also launch the U-Car sharing and leasing system to add more efficiency to city mobility.
3. Smart Taipei Main Station
The structure of Taipei Main Station is complicated. The complex serves as the hub for high speed rail, Taiwan Railway and Taipei MRT. It sees an average of 500,000 commuters each day, hence the importance in upgrading both security and convenience. Taipei City cooperates with technology industries and adopts integrated APPs service to provide public with indoor navigation, emergency escape, smart parking and tourism information. In the future, such smart service will be expanded to all MRT stations.

4. Smart Friendly Bus Stop
To provide better and friendlier public service, Taipei City has set up interactive 4G smart bus stops installed with solar panels on top of the structure. The back panel of the bus stop offers timetable, weather, EasyCard balance query, bus status information and other services as well as USB charging sockets and free WiFi internet. These services come in handy for passengers.

5. Smart Parking Services
Taipei City adopts information communication technology incorporated with sensor facilities (such as parking meters and ground magnets) and wireless transmission technology (LoRa / WiFi) to detect instantly parking space availability and provide roadside parking information and route guide services via APPs. Drivers can pay online via APPs while patrolling personnel may check the use of roadside parking space instantly.
Taipei City builds public housing not only to realize the right to housing, implement urban aesthetics but also hope to improve the quality of the housing environment. The creation of new housing operation model turns public housing into experiment sites for Smart City industries. Currently, these public housing units come with three smart meters (water meter, electricity meter and gas meter) with additional 3%-5% of construction funding allocated to the installation of smart facilities. Taipei City will offer a diversity of smart services in public housing communities, including smart library, smart health care, smart daycare, smart office, and smart shops. Taipei City plans to build 12,000 units of public housing.
1. Smart Health Care
Taipei City conducted an experiment on “people-oriented” smart health care services, including Personal Health Record (PHR) and Community Care Platform (CCIP) at the six branch campuses of Taipei City Hospital. Moreover, the program offers open information technology to suppliers with emphasis on medical expertise of the respective branch campuses, assisting the hospitals with smart health care services and eventually expanding the implementation to more hospitals. The public can use the cloud system for monitoring and managing their personal health. In the future, some data can be integrated into the social care system for other service applications.

2. Smart Elderly Care
Taipei City cooperates with private sector partners to provide various innovative services for the elderly, including anti-fall detection system, emergency notice system, and care by robots. Moreover, the program “conference secretary,” which uses TV as the interface and remote control to input commands, is designed with the concept of allowing senior citizens to receive calls from afar at any time.

3. Smart Sports Center
The public can use an online reservation system to reserve facilities or classrooms at the sports centers. After arriving at the sport center, users can control the facility lighting and save/upload exercise records with the tag. The administrators can provide training courses and exercise suggestions that better meet users’ needs based on the data. In the future, the system is expected to integrate with national health insurance records to incorporate sports records into the health insurance system for more advanced services.
1. Taipei Maker Education Initiative
Maker Movement began in Europe and the United States with an emphasis on DIY and the philosophy of creativity. Taipei City organized the pilot program “Taipei Maker Education Initiative” in local elementary schools since 2016 with the objective of promoting maker education. The center also trains teachers, emphasizing learning through hands-on experience and international exchange to educate students in aspects such as creativity, independent thinking, hands-on practice, and problem-solving.

2. Taipei CooC Cloud
To promote digital learning and eliminate the gap between urban and rural education resources, Taipei City launched the “Taipei CooC Cloud” for students to study independently by using the online resources, including access to over 250,000 e-books. It also provides teachers with one-stop teaching services, including teaching material collection, teaching material transformation, teaching development, and study evaluation to remedial teaching, directly through Taipei CooC Cloud. Meanwhile, teachers can exchange experiences with other teachers through the platform.

3. Smart English Learning
Private-sector enterprises cooperated with TPMO to launch the “ABC Interactive Theme Park” mobile APP. This program integrates augmented reality (AR) and GPS technology in a way similar to those in “Pokemon GO” to encourage users to explore Taipei Children’s Amusement Park and learn English through situation immersions.

4. Safe Campus
Taipei City is in line with world-advanced DSA (Dynamic Spectrum Access) technology which instantly delivers high-definition images from campus surveillance devices through technologies such as frequency spectrum sharing, low-frequency high-speed transmission, and wireless long-distance dissemination to the central control office. Moreover, AI cameras are installed in demonstration elementary schools as a part of the “A.I. Virtual Guard Demonstration Program.” Unlike traditional e-Fence system that often yielding misreport due to lighting, buses or animal passing, this solution can accurately identify trespassers based on actions such as climbing wall, leading to a boost in security and creating a safe education and learning environment.
1. Smart Pay Integrated Platform System
Taipei City established the 'pay.taipei' platform, which is the only payment system in Taiwan that integrates various city fees. Users can check with the system and pay the fees any time with more convenience. The respective agencies of Taipei City Government don’t need to develop their individual payment system. This will substantially increase the convenience of online account verification and query while reducing the financial burden of city government through less expenditure on handing fees. As the payment gateway for paying municipal public fees, the system interfaces with different payment operators through a consistent API interface, allowing the public to freely choose from a list of different payment methods, combined with the concept of membership account information. The billing details will be recorded, making this service the citizen’s digital ledger for public service expenses.

2. Multi-Function E-Card
The circulation of "EasyCard" began in June of 2002 as a way to pay for MRT rides. Today, over 80 million EasyCards have been issued. EasyCard has become an indispensable payment carrier for Taipei citizens, while the ownership rate of EasyCard by people across the island reaches as high as 89%. EasyCard has shown outstanding performance in both the transportation and small-transaction markets. Moreover, Taipei City launched "Taipei Card" that integrates the different membership system of various agencies with EasyCard. Nowadays, EasyCard not only works as a card to make smart payments; it’s integration with city services further adds convenience of citizen’s life. Aided by the APP, Taipei Card 3.0 integrates all kinds of card certificates in Taipei City through service-to-home mode. Citizens can use Taipei Card APP to access all types of municipal services provided by Taipei City.
1. Energy Saving Light Control Demonstration
The parking lot in front of Taipei City Hall is used as the demonstration site for this project. All lights within a large area are linked wirelessly while the introduction of pre-lighting system creates a more friendly and safe parking environment. The system detects motions and automatically regulates lighting to ensure energy-use efficiency. Such installation does not require the modification of existing circuits, while the linking distance and range can be configured through mobile phones.

2. Air Quality Monitoring
Private-sector sponsored ‘AirBox’ are currently installed across 300 sites in Taipei City. Among these, 150 units are installed on the campuses of elementary schools. The system not only collects data such as air pollution, temperature and humidity, but it also uploads the data to a cloud platform and presents in a visualized manner to the public. Additionally, elementary school curriculum has been modified to introduce Maker Education using ‘AirBox’ as a hands-on example. This exposes students to Information technology and helps them develop environmental awareness, as well as educating them to become potential Makers. This project has become a success story for other countries (i.e. South Korea) to follow.
3. Taipei IoT Innovation Lab
Taipei City proactively teams up with private-sector partners and acts as the interface between private-sector resources and demonstration site via the matching platform of TPMO. The Lab established a communication technology platform which is free to use for innovative teams and application developers. Currently, there are more than 80 teams that use the LoRa platform. Moreover, the IoT Innovation Lab offers 10,000 Sigfox free accounts in an attempt to encourage the community to use the service and find solutions for urban issues.

4. Instant Positioning Rescue System
Taipei City Fire Department created the “Conference 119,” which allows the public instantaneously report the GPS position and site imaging via smart phones, which effectively shorten the time for disaster rescue. The “Conference 119” also offers video call function and CPR instructional videos. These functions ensure instant information from the site of disaster and help with emergency rescue work on site.

5. Smart City Waste Recycling Integration System
Taiwan has implemented the policy of “Keeping Trash off the Ground” for many years. The policy has proven effective in improving the environment, but requires much support in manpower and time. Currently, private companies are proposing a 24-hour waste and resource recycling system. This new solution is equipped with airtight deodorization, as well as low-temperature bacteria-inhibiting and compression functions. It also comes with sensors that can collect system information through cloud management and provide IoT technical analysis to assist in management and recycling efforts, as well as trash collection route-planning. The city will remain clean through this innovative and effective approach.

6. Unmanned Aerial Vehicle Disaster Communication Backup
Taipei City introduced a project based on existing information and communication, involving the creation of an “Urban Disaster Communication Backup Platform.” The platform integrates Unmanned Aerial Vehicle (UAV) and wireless internet equipment. Info regarding disaster updates and status are transmitted to the platform supplier for integration. When communication becomes disrupted during disasters, victims can still connect to the UAV communication equipment and transmit their current conditions to the disaster report center. Moreover, relief workers can also take aerial shots on the disaster zones using UAV, enhancing the efficiency of disaster relief efforts.
1. Taiwan’s JOIN Platform
Taipei City launched its i-Voting system, inviting the public to vote online on issues of concern. Citizens can express their opinions through a diversity of channels to implement policies that will assist them in implementing their ideal lifestyle. In June of 2017, the voting on the first citywide participation budget was held in Taiwan. Up through today, a total of 29 propositions have been the subject of votes on this platform. Citizens in Taipei can directly participate in political discussions which have direct impact on government operations through i-Voting system.

3. Civic Tech
Taipei City works with private sector partners to tap upon Civic Tech resources to help NGOs and NPOs implement solutions through the help of information technology and government’s authority. As demonstrated in the case of Formosa Fun Coast Park Explosion, Civic tech facilitated the quick organization of manpower and resources, information visualization, and medical information matching, thereby allowing the creation of a query system with information on the wounded over a short period of time. Moreover, Taipei City proactively learns from and exchange views with the civic tech community members via numerous workshops. An example of such activity is the ‘Social Welfare Open Data Workshop’ in 2017, which was jointly organized by DOIT and the Department of Social Welfare. During the workshop, the public sector and community members worked together, discussing how to use open data to solve issues of welfare such as platform of Child Care Finding and Accessible Friendly Map.

2. Open Government
Taipei City integrates open data from all departments on the Data.Taipei website. The data is accessible for the public and developers to view online or download, as well as interfacing through API. The formats of the data are diverse and updated frequently, with 2,690 datasets so far on the website and being accesses almost 44 million times. Therefore, open data have achieved social impact by being accessible to the public. For example, Taipei City makes datasets on air quality and related analytical results, budget visualization, and bus status information available to the private sectors, who in turn develops many APPs which help makes people’s life more convenient. These cases also show how open government policy enables citizens to make direct impact on the government.

---

**OPEN · TAIPEI**

1. Taiwan’s JOIN Platform
Taipei City launched its i-Voting system, inviting the public to vote online on issues of concern. Citizens can express their opinions through a diversity of channels to implement policies that will assist them in implementing their ideal lifestyle. In June of 2017, the voting on the first citywide participation budget was held in Taiwan. Up through today, a total of 29 propositions have been the subject of votes on this platform. Citizens in Taipei can directly participate in political discussions which have direct impact on government operations through i-Voting system.

2. Open Government
Taipei City integrates open data from all departments on the Data.Taipei website. The data is accessible for the public and developers to view online or download, as well as interfacing through API. The formats of the data are diverse and updated frequently, with 2,690 datasets so far on the website and being accesses almost 44 million times. Therefore, open data have achieved social impact by being accessible to the public. For example, Taipei City makes datasets on air quality and related analytical results, budget visualization, and bus status information available to the private sectors, who in turn develops many APPs which help makes people’s life more convenient. These cases also show how open government policy enables citizens to make direct impact on the government.

3. Civic Tech
Taipei City works with private sector partners to tap upon Civic Tech resources to help NGOs and NPOs implement solutions through the help of information technology and government’s authority. As demonstrated in the case of Formosa Fun Coast Park Explosion, Civic tech facilitated the quick organization of manpower and resources, information visualization, and medical information matching, thereby allowing the creation of a query system with information on the wounded over a short period of time. Moreover, Taipei City proactively learns from and exchange views with the civic tech community members via numerous workshops. An example of such activity is the ‘Social Welfare Open Data Workshop’ in 2017, which was jointly organized by DOIT and the Department of Social Welfare. During the workshop, the public sector and community members worked together, discussing how to use open data to solve issues of welfare such as platform of Child Care Finding and Accessible Friendly Map.
Taipei City actively seeks to connect with other smart cities around the world to share experiences and learn from each other positively through international smart city events and conferences. Since 2014, Taipei City has hosted the Smart City Summit & Expo every year to strengthen our ties with other smart cities. Over 300 delegations from 120 cities across 33 counties attended the Taipei Smart City Summit & Expo in 2018.

As of to date, Taipei City has established ties with over 30 international cities and continues to exchange ideas across various topics with them. Moreover, Taipei City plans to establish an open, practical global organization GO SMART (Global Organization of Smart Cities). Our next goal is to develop practical corporations with our international friends, involving what we call “inter-City POC”. We hope to expand testing fields across borders and exchange possible solutions with other cities, cooperating with local and international ICT vendors to create a Smart City-based economy.
<table>
<thead>
<tr>
<th>Award of Distinction</th>
<th>The Open Group Awards for Innovation and Excellence (2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Place of Global Open Data Index</td>
<td>Open Knowledge Foundation (2017)</td>
</tr>
<tr>
<td>Winner of DX Leader-Operational Transformation Award</td>
<td>International Data Corporation (2017)</td>
</tr>
<tr>
<td>Golden Award- Cooperative City</td>
<td>World e-Governments Organization of Cities and Local Governments (2017)</td>
</tr>
<tr>
<td>Winner of Local Government Awards</td>
<td>Intelligent Transportation Society World Congress (2017)</td>
</tr>
<tr>
<td>Fifth Place of Most High-Tech Cities in the World</td>
<td>World Economic Forum and Business Insider (2017)</td>
</tr>
<tr>
<td>ASOSIO, Metro-ICT Best Practice Award</td>
<td>ASOCIO, Asian-Oceanian Computing Industry Organization (2017)</td>
</tr>
<tr>
<td>Asia Pacific Excellent Project Management Award</td>
<td>Project Management Institute (PMI) (2017)</td>
</tr>
<tr>
<td>Winner of Smart City Asia/ Pacific Awards-Transportation Category</td>
<td>International Data Corporation (2016)</td>
</tr>
<tr>
<td>Winner of ITS Industry Achievement Award</td>
<td>Intelligent Transportation Society World Congress (2016)</td>
</tr>
<tr>
<td>Winner of Smart City Asia/ Pacific Awards</td>
<td>International Data Corporation (2015)</td>
</tr>
<tr>
<td>e-Government Prize in Services Category</td>
<td>World e-Governments Organization of Cities and Local Governments (2016)</td>
</tr>
<tr>
<td>Public Sector Excellence</td>
<td>World Information Technology and Services Alliance (2012)</td>
</tr>
<tr>
<td>Best e-Government Prize in the Category of Services</td>
<td>World e-Governments Organization of Cities and Local Governments (2012)</td>
</tr>
</tbody>
</table>