

Construction And Planning

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I. Construction and Planning Agency Organization

The CPA includes 14 divisions: Planning, Urban Planning, National Parks, Public Housing, Building Administration, Public Works, Road Engineering, Environmental Engineering, Building Engineering, Construction, Planning Administration, Management Administration, Land Administration, Finance Administration; 4 offices: Secretariat, Accounting and Statistics, Civil Service Ethics, and Personnel; and 9 temporary units established for specific tasks: the New Town Construction Division, Urban Regeneration Division, Public Relation Office, Office of Senior Technician, Information Management Office, and the Northern, Central, Southern, Sewer Engineering Offices. There are 4 divisions under the Central Region Office: Construction Management, Urban and Rural Planning, Planning and Review, and Administration Management. It also includes the headquarters for Kenting National Park, Yushan National Park, Yangmingshan National Park, Taroko National Park, Shei-Pa National Park, Kinmen National Park, Marine and Taijiang National Park, National Nature Park Headquarters, and the Urban and Rural Development Branch.

II. Comprehensive Planning

1. Spatial Planning

- (1) On April 30, 2021, the municipality and county (city) spatial plans were announced to establish the spatial development order and implement local autonomy.
- (2) The CPA assists the municipality and county (city) governments in delineating the functional zone maps, guiding the land to be used orderly.

2. Coastal Zone Management

The CPA has continuously promoted the Coastal Zone Management Act and revised coastal zones. The CPA will build an effective and functional system to integrate the conservation, protection, and management of affairs among relevant authorities and manage the coastal local connection action plan. Furthermore, according to this new legislation, the CPA will be able to implement the planning of Taiwan's coastal lands while considering the preservation of the balance between environmental conservation, protection, and development.

3. Review of Non-urban Area Development Projects

In 2022, 8 development projects (covering 403 hectares) were officially approved, while 14 projects are still under review. These projects will provide the developmental area for solar energy facilities, industrial parks, rural communities, important public facilities, etc.

III. Urban Planning and Construction

1. Expediting the Review of Urban Planning Projects

In 2022, the Urban Planning Commission (UPC) convened 21 meetings. During those meetings, the UPC reviewed 250 urban planning projects proposed and approved by the special municipality and county governments. In addition, to save time for the commission review, the ad hoc group, formed by committee members, convened meetings to listen to project presentations first. Then, the members made specific suggestions and proposed discussions before the minister signed and approved the projects. The commission will urge the local authorities to expedite the review of urban planning projects to enhance the efficiency of such reviews.

2. Subsidizing Local Governments for the “Townscape Renaissance and Revitalization Project”

“Townscape Renaissance and Revitalization Project” actively explores the resources and potential of the local special natural and artificial landscapes. According to the concept and value of Landscape Urbanism advocating aesthetics of nature, it removes the transitional standard construction method. Consider the future of urban areas in the face of climate change and urban development. Landscape Urbanism adopts innovative and creative landscape design methods to integrate public open space, water, and green environmental resources. It improves the overall urban landscape and living space quality.

From 2021 to 2022, the 21 bright spot projects, with a budget of NT\$1.002 billion, and 204 policy-guiding projects, with a budget of NT\$1.015 billion, were approved and subsidized. These have created livable, charming cities and towns.

IV. Urban Renewal

1. Since 2005, the CPA has explored the waterfronts, harbors, railway and MRT stations, and old city districts with the National Development Council, Executive Yuan, and local governments and has selected 314 locations as urban renewal demonstration projects. 58 government-led urban regeneration tenders had begun the execution of agreements till the end of 2022.
2. 1,053 urban regeneration projects were approved up to the end of 2022.
3. 182 resident-led urban regeneration projects were subsidized up to the end of 2022.
4. Up to the end of 2022, 3,338 urban unsafe and old building reconstruction plans were requested, and 2,746 were approved.
5. The CPA established the National Housing and Urban Regeneration Center on August 1, 2018. The National Housing and Urban Regeneration Center assists the governments at a national and local level in implementing urban regeneration and social housing projects.

V. National Parks Management and Environmental Conservation

1. National Park Operations and Management

A national park is an area defined by the national government to protect biodiversity and specific scenic and historical sites and provide public recreation and research. The National Park Law was promulgated in 1972 in Taiwan. Currently, there are nine national parks and one national nature park: Kenting, Yushan, Yangmingshan, Taroko, Shei-Pa, Kinmen, Dongsha Atoll, Taijiang, and South Penghu Marine National Park, and Shoushan National Nature Park. The national park headquarters are under the administration of the Ministry of the Interior (MOI) and are responsible for the effective management and conservation of park assets.

(1) Kenting National Park (KTNP)

Kenting National Park is located in the southernmost part of Taiwan, with beautiful scenery, lush plants, and magnificent terrain. It is the first National Park covering a marine area.

In 2022, in terms of management, based on the regulation of the Fourth Comprehensive Review of Kenting National Park Plan, 32 original buildings were approved, and 21.5 hectares of land were donated for the core protection area.

In terms of conservation, 10 research projects related to natural resources were implemented, and the Eco-Friendly Farming Project was carried out with 60 local farmers. 7 farmers are certified according to the Friendly Agricultural Standards of National Park. Volunteers and "Ready for Work" project employees assisted in the yellow crazy ant (*Anoplolepis gracilipes*) prevention project. Habitats of land crabs in Banana Bay, Shadao, and Gangkou Area were improved. Exotic tree species, White Poplar, were removed, and 12 hectares for forest planting were added.

Regarding recreation service and interpretation education, recreational safety and crowd management are strengthened in response to tourism in the post-COVID-19 era. The number of eco-tourism management models has increased, including the Jonkeo Raptors Festival and Dating with National Park environmental education activities. Several publications were released, including the Illustrated Guide to the Moths of Kenting National Park Part 2 -Non-macroheteroceran groups and the poster for Kenting National Park. We promoted the video "The Unwanted Guest of Longluan Lake" and held the "Land Art Exhibition of Jonkeo Raptors Festival".

In 2023, KTNP will start the 5th Comprehensive Review of Kenting National Park Plan and promote the "Kenting National Park Community Eco-tourism Management and Sustainable Development Plan" to achieve a situation where the environment, local cultures, and local industries can thrive harmoniously.

(2) Yushan National Park (YSNP)

Located in the center of Taiwan, Yushan National Park (YSNP), with its abundant natural resources, is considered a prime destination for hiking, eco-tourism, and environmental education.

In terms of management in 2022, YSNP accomplished the Fourth Comprehensive Evaluation of Yushan National Park Plan. In addition, YSNP was awarded the "2022 Annual TGOS Circulation Service Award" by the Ministry of the Interior and the "19th Records Management Quality Award" by the National Archives

Administration of the National Development Council.

Regarding ecological conservation, YSNP has commissioned studies on groups of Formosan black bears, made a documentary and written a popular science book about raptors, and promoted the scientific research base and citizen scientist project to make Yushan National Park one of the largest outdoor classrooms.

In terms of interpretation and environmental education, YSNP launched an on-site Formosan black bears conservation interpretation plan, held environmental educational activities such as Youth Camp and 3-Generation Family Travel in National Parks, and started to plan the refurbishment of the exhibition room of Meishan Visitor Center to enhance the service quality.

As for hiking safety and service, YSNP has completed several renovations projects, including repairing the Yushan Trail and accessible trails in the Tataka area, to enhance the service to visitors of all age groups. In addition, a new service center, "Dongpu Information Center," opened its door on the northwestern side of the park to provide exhibitions, guiding, and consulting services to improve the service to visitors and local residents.

In 2023, YSNP will continue the project of construction and renovation of the cabins and trails in the park and the studies on high-altitude ecology. To maximize a national park's role, YSNP will keep strengthening the relationship with the tribes surrounding the park and improving the hiking safety and services.

(3) Yangmingshan National Park (YMSNP)

Situated in the Greater Taipei area, Yangmingshan National Park is renowned for its special volcanic landform and is the world's first quiet urban park. It has a varied climate, ecological environment, history, and unique culture.

In terms of operation and management, six administrative regulations, decrees, or projects have been newly added or revised. The Yangmingshan National Park Project (the Fourth Comprehensive Review) was implemented in 2022. The headquarter promotes eco-friendly farming in the Park. 35 farmers have signed up as "Friendly Partners" of the Park Headquarter; 10 have been awarded organic certificates, and 10 have been recognized as eco-friendly farmers. Unity within the Park community has been effectively enhanced. The landscape environment and habitat preservation result from the joint effort of Park community members.

Regarding ecological conservation, the Headquarter actively investigated and researched flora and fauna, including 7 commissioned research cases, 1 publication of conservation research results, 24 sessions on habitat conservation and restoration efforts, and removing invasive alien species from 8.17 hectares. We published the book "Tea of Grass Mountain: The Development of Taiwanese Tea Industry in Yangmingshan National Park 1830-1990," which received the 2022 Excellence Award by the Taiwan Historica and the 46th Golden Tripod Award for Publications by the Ministry of Culture.

As for interpretive education, 24,423 visitors utilized the Park's environmental education and eco-tourism services, 57 classes on environmental education, and 6 advanced training workshops were held, all of which have been well received and have successfully promoted the concept of national parks. The headquarter signed a memorandum of cooperation virtually with Gyeongju National Park of Korea on October 20, 2022, to enhance international exchange, formally establishing an exchange mechanism between the national parks of Taiwan and Korea.

In 2023, we will continue promoting conservation, environmental education, and partnerships and improving recreation and facilities' quality. We strive to brand-build our national park and balance visitor enjoyment and environmental protection to honor the Park's core value of sustainable development.

(4) Taroko National Park

Taroko National Park is located in eastern Taiwan and is famed for its magnificent high mountains, gorge terrain, rich ecology, and culture.

In terms of operation and management in 2022, the fourth overall review of the Taroko National Park Plan was handled, and an open exhibition and three explanatory meetings were completed; the indigenous area resources co-management committee continued to be handled, and subsidies provided to indigenous people for holding activities and empowerment training to promote partnership. Other work, including laying on free shuttle buses during the Lunar New Year, snow season duty on Mt. Hehuan, park public accident liability insurance and additional insurance and public safety management maintenance,

supervision, and checking and evaluation work was handed to raise the level of recreational service quality; the mountain cabin overall improvement project was executed, and construction of the mountain cabin on Qilai East Ridge, renovation of the cabin at Yunling, marking of camping spots at the Nanhu Yunlin Cirque and route-change on dangerous trail sections carried out to provide a better climbing environment.

Regarding environmental maintenance, repair of Idas Trail and reinforcing of Zhuilu Trail of Little Central Cross-island Highway was completed, the two places opening repetitively on July 21 and November 18. In the area of nature conservation, seven commissioned plans were completed, Formosan Landlocked Salmon conservation, conservation patrol and monitoring, advocacy, clearing of alien species, and citizen scientist and other lectures and workshops were handled. As for interpretation and education, environmental education activities, Taroko Gorge Concert, Small Farmers' Regional Revitalization Market, etc., continued to be held, promoting Taroko tribe music and dance culture and the cultural and creative industries.

In 2023, various facility maintenance and disaster repair projects will be handled, the fourth overall review of the Taroko National Park Plan will continue, and the promotion of various conservation studies, interpretation and education, and co-management of indigenous resources will continue to protect diverse values.

(5) Shei-Pa National Park

Shei-Pa National Park, located in the Xueshan Mountain Range of northern-central Taiwan, is an alpine national park home to important plant and animal species and populations. It is also where citizens can go hiking for pleasure, conduct environmental interpretation and education, and participate in eco-tours.

Regarding ecological conservation in 2022, we completed 11 entrusted projects on resource surveys, habitat monitoring, etc., and organized 4 sessions of "2022 Shei-Pa Conservation Pioneer

Lectures." 2022 was a fruitful year for the conservation work of the Formosan landlocked salmon, whose wild population reached a record high (15,374).

We held 665 sessions of themed activities and environmental education courses for environmental interpretation. The short film "The Legend of KoKo' Ta'ya" was awarded the Best Educational Film in the 2022 Universe Multicultural Film Festival held in California, USA. In the aspect of improving safety in alpine environments and services, we completed the "construction project of the Piaodan and Youpolan Huts," organized 8 sessions of hiking ecology classroom lectures, and in line with the Executive Yuan's Open Mountain and Forest Policy, carried out the "Snow Season Services" to ensure hiker safety.

In terms of management, we organized 6 sessions of agency communication and co-management meetings with indigenous peoples, launched the scholarships in 2022 for outstanding indigenous students within the range of Shei-Pa National Park and from its neighboring communities, and held activities jointly with nearby agencies and schools on cultural traditions, ecological conservation and trips to connect with one's roots to promote indigenous culture and build partnerships.

In 2023, we will continue the restoration and release of our national treasure -- the Formosan landlocked salmon -- into rivers of its historical habitats and develop the teaching plan related to its in-depth environmental education; we will also continue to promote the construction project of Sanliujiu Cabin, to increase the awareness of hiking safety and popularize environmental education experience activities.

(6) Kinmen National Park

Kinmen National Park is located in Kinmen County. It is a national park based on culture and battlefield relics and has a natural resources conservation function.

In 2022, in coordination with the opening of Kinmen Bridge, the "Kinmen Highlights Plan" was drawn up with the Kinmen County Government, requesting an additional NT\$1 billion from the central government 2022-2026 for the optimization of the park cycleways and trail system with local residents, and through the linkage of Kinmen Bridge, provide mobile battlefield experience spaces and activities.

As for ecological conservation, a study of cormorant migration and ecology and Eurasian otter phylogeny and group movement was completed. In the area of interpretation and education, the film *The Islands of The Swaying Grain KINMEN* won the Excellence Award at the US Accolade Competition and Honorary Award at the Tokyo International Film Festival; physical and online survival games, Eco-Friendly cycling, tunnel music festival, military heritage online lectures and other activities were also held.

Regarding environmental maintenance, the restoration of three traditional buildings at Qionglin 179 and 203-1 and Andong No. 2 Camp, respectively, and battlefield relics were completed. In terms of

management and operation, Ocean Taiwan coastal floating rubbish cleaning continued; in response to the pandemic, homestay and shop tenants in the park were given “rent reduction” to ease their burden, and residents were given short-term employment opportunities to build local partnerships.

Implementation of the “Kinmen Highlights Plan” will continue in 2023, as well as the work with the Kinmen County Government, including preservation of traditional settlements, maintenance of battlefield relics, and ecological conservation.

(7) Marine National Park (Dongsha Atoll National Park and South Penghu Marine National Park)

Dongsha Atoll National Park, located north of the South China Sea, is about 450 km from Kaoshiung. South Penghu Marine National Park, located between Wangan Island and Chimei Island of Penghu, consists of Dongji Island, Xiji Island, Dongyuping Island, and Xiyuping Island, as well as nine small islets, wave-swept rocks, and surrounding waters.

We aimed to complete the improvement of seawater desalination facilities in 2022 and reduce groundwater pumping to conserve the precious groundwater resources in the Dongsha Atoll Marine National Park. We completed the standby unit of the seawater desalination facilities in the South Penghu Marine National Park to provide a stable and safe water supply for environmental education and ecological tours. Furthermore, we are promoting the new construction of a visitor center, constructing a space for high-quality marine conservation, marine environmental education, and public activities, and serving as the operating base for the sustainable operation of Marine National Park in the future.

Regarding marine conservation, several studies and the survey of terrestrial and marine resources were conducted in the Dongsha Atoll and the South Penghu Marine National Park. Those studies were transformed into public scientific books for the public to understand our national parks. We also provided funds for the students to conduct research in the national parks.

Regarding the promotion of environmental education, a cooperation agreement was signed with the National Taiwan Normal University on November 17, 2022, to promote marine environmental education. A “Snorkeling Instructor Safety Education Training” was jointly organized with the Penghu National Scenic Area Administration. Two sessions of practical training for eco-tourism were held, with 36 participants completing the training. Two demonstration tours were also tried, with 62 participants. Promoting environmental education and experiential activities in the South Penghu Marine National Park attracted 42 members of the general public, 42 families with children, and 31 college students. We organized three levels of handmade trail activities on Donyupingyu and Dongjiyu, invited the community, the public, and volunteers to participate together, and used local materials to preserve the natural and cultural environment of Donyupingyu and Dongjiyu. The Marine National Park Headquarters Photo Contest was also held at the National Marine Park Headquarter office building.

In 2023, we will continue to promote conservation and hold environmental education courses to achieve the sustainable management of our national parks.

(8) Taijiang National Park (TJNP)

Taijiang National Park's area includes the Tainan Sicao area and Qigu District. It is located in southwest Taiwan, a wetland national park.

In 2022, in terms of management, two sets of community eco-tourism programs and three project design and packaging items were completed. In addition, 19 financial grants for community empowerment were approved. We implemented the Paying Tribute to the Sea policy and cleaned up 617.1 tons of marine waste. To enhance carbon-free tours with public transportation, the Taijiang Interpretation Bus operated 100 times, with total tourist satisfaction reaching 97%.

We completed 1 entrusted research project and 8 commissioned projects related to ecological conservation. According to the number of black-faced spoonbills survey, there were 3,644 black-faced spoonbills in the Greater Tainan area, an increase of 338 compared to the same period in the previous year. In addition, to realize the vision of the “Aichi Target” of the United Nations International Convention on Biological Diversity, we signed a letter of intent with 28 local fish farmers to promote the creation of ecologically friendly habitats, with the implementation of friendly strategies such as lowering the water level, successfully attracting water birds to come for food.

Regarding environmental maintenance, we will promote the Sicao observation post-renovation project and improve the quality of recreational services at Natural Defense of the Capital. We will also continue to repair existing facilities in the national park and develop community construction to improve the quality of

tourist services.

Regarding interpretive recreation, we carried out the Taijiang Wetland School and Dates with National Parks, with 318 events, in which 9,375 people participated. We published the picture book "Racing in Taijiang", recognized by the Taiwan Archives of the National History Museum for "rewarding publication of literature and periodicals". In addition, the Taijiang National Park Visitor Center provides high-quality services for tourists. The number of visitors was approximately 127,000 in 2022.

We will continue to promote the conservation and environmental education of national parks, implement the home protection circle plan, and conduct the conservation and exchange of international migratory species to creatively plan the blueprint for the new stage of national park development and promote local coexistence and prosperity to achieve the concept of sustainable national parks.

(9) Shoushan National Nature Park (SNNP)

Shoushan National Nature Park is in Kaohsiung and includes the Banpingshan, Gueishan, Shoushan, and Qihoushan areas. SNNP possesses a unique natural coral reef ecology and precious prehistoric cultural relics. The park also promotes environmental education and maintains natural ecological and human resources.

In terms of operation and management, it handled 2 times of the National Natural Park Operation and Management Advisory Committee and 1 seminar of joint co-management of Shoushan National Natural Park and Fortress Control Area; Counseled potential national natural parks, completed 30 courses on community cultivation in Matoushan, and developed 2 local characteristic symbols and 2 characteristic handmade cultural and creative products; Completed the establishment of the Information Security Management System (ISMS) of the NNP.

In terms of environmental maintenance, under the policy of "Ocean Taiwan-Beach Clean-Up", 58 beach inspections were conducted, mobilizing 153 people and removing 5,528 kg of trash. The recreation facilities of Shoushan were constructed to enhance recreation service quality.

Regarding interpretation and environmental education, we have cooperated with the public sector to organize the re-settlement of stray animals. In addition, we have provided quality environmental education services to the public and handled 190 environmental education activities, in which 13,405 people participated.

In 2023, to enhance recreation service quality, the recreation facilities of Shoushan will continue to be improved. We will continue to offer environmental education activities and convey the concepts of environmental and biodiversity conservation to the public.

2. Metropolitan Park Construction and Management Program Implementation

(1) Taichung Metropolitan Park (TCMP)

Located on the Dadu plateau in Taichung City, Taichung Metropolitan Park boasts rich plant and animal ecology and extensive green spaces to provide diverse recreational activities, promote environmental education, and maintain natural ecological resources.

In 2022, we improved the pool filtration system and aeration facilities to decrease ecological pool eutrophication and enhance the environmental quality of this park. In terms of promoting environmental education, the park implemented the "2022 Protect Mt. Dadu" activities, "Taichung Metropolitan Park Anniversary~ establish the foundation for environmental education" activities and has organized 10 buses of extracurricular teaching activities, 2 environmental education workshops for schools, 1 parent-child environmental education activities and 6 Taichung Metropolitan Park environmental education speeches. 1,725 people participated in the park's environmental education courses and activities. Additionally, the park provides free venues for charity events; these venues were borrowed for 19 events. Guided park tours were provided for 5 schools and organizations with 170 participants. In 2023, we will continue to enhance the park's recreation quality, improve the environmental facility, and strengthen the promotion of environmental education, making Taichung Metropolitan Park an important outdoor classroom for environmental education in the Taichung Metropolitan Area.

(2) Kaohsiung Metropolitan Park (KMP)

Kaohsiung Metropolitan Park is in Nanzi District and Qiaotou District of Kaohsiung City. It is designed to combine an urban forest and ecological planting, providing Kaohsiung residents with a place for outdoor leisure, recreation, and environmental education.

In 2022, several facilities were improved for visitors' convenience and safety and to provide a safe, quality recreation environment. The KMP ameliorate public toilets, walking area, and broad-casting system. In addition, the KMP has also strived to promote environmental education. The KMP offered 10-course packages of environmental education to the public. A total of 44 sessions of activities held by the KMP served 1,302 people; moreover, 16,265 people participated in our ecological documentary film screenings, exhibitions, and interpretation services. To offer a better recreational environment, the KMP continued to repair the skating driving range and improve building earthquake reinforcement in 2023.

VI. Housing Policy

1. Promotion of the "Integrating Housing Related Funds Program" and "30 Billion Special Program for Expanded Rent Subsidies by the Central Government" by the CPA

In 2022, the "Integrating Housing Related Funds Program" approved 6,391 household subsidized interest loans for home buying and 593 household subsidized restoration loans. See Table 8-1. In 2023, this policy provided 4,000 households with subsidized loans for homebuyers and 2,000 households with subsidized restoration loans. In 2022, "30 Billion Special Program for Expanded Rent Subsidies by the Central Government" rent subsidies were granted to 273,057 households, and 500,000 households are expected to receive subsidies in 2023.

Table 8-1 Public Housing

Unit: Household

Year	Integrating Housing Related Funds Program		
	Approved Households for Subsidized Interest Loans	Approved Households for Subsidized Restoration Loans	Approved Households for Subsidized Rent
2018	5 543	686	65 712
2019	5 403	613	72 045
2020	5 124	722	116 893
2021	7 412	992	131 265
2022	6 391	593	273 057

2. Promotion of Social Housing by the CPA

To satisfy public housing demand, the MOI has implemented the Housing Act, which was revised on January 11, 2017, and the Implementation Program for Social Housing project, which was approved on March 6, 2017, for the construction of 200,000 social housing units that are only for rent and not for sale within eight years, including 120,000 new housing units and 80,000 rental housing subleasing and management cases. In the first stage, from 2017 to 2020, the goal of the social housing units is to construct 40,000 units and 40,000 rental housing subleasing and management cases. By the end of 2022, 71,112 social housing units had been completed. The Rental Housing Subleasing and Management Project (the RHSMP) has been implemented since 2017. Through the cooperation of local governments, the National Housing and Urban Regeneration Center (HURC), and the private sector, this project aims to carry out 80,000 cases within 8 years. By the end of 2022, it had reached 57,233 cases. The goal for 2023 would be to reach 70,000 cases. While the construction of social housing is still in progress, the MOI would continue to assist in guaranteeing people's right to housing through the RHSMP.

3. Housing Quality

To encourage people to improve their accessibility environment, the MOI promoted the 2022 Directions Subsidies to Municipalities and Counties (Cities) to improve the Existing Residential Barrier-free Facilities Plan. It planned to subsidize 10 private apartment buildings below five floors to improve the shared use of barrier-free facilities and additional lifting equipment and to subsidize 10 private apartment buildings to improve the shared use of barrier-free facilities.

VII. Building Management

1. Review and Revision of Building Administration Regulations

- (1) Amended and announced Article 77-1 of the Building Act in response to the Hualien earthquake disaster on February 6, 2018, to strengthen the structural safety of the existing legal buildings. Buildings used by the public or deemed necessary by the central competent construction authority must be improved or repurposed if the structural safety does not meet current regulations.
- (2) Article 29-1 and Article 49-1 of the "Condominium Administration Act Building Administration Division" have been added to regulate apartment buildings that have obtained a construction license but have not established a management committee or elected a management leader. If these buildings are deemed dangerous by the competent authority, a management committee must be established, or a management person must be elected within a specified period. Failure to do so will result in penalties.
- (3) The Building Equipment part of the Building Technical Regulations and the Design and Technique Directions for Building Water Supply and Drainage Equipment now include regulations for the same-floor drainage system to reduce water leak repair conflict between the owner of the upper and lower floors of the building, and to simplify equipment management and maintenance. Amended a part of "Seismic Design Specifications and Commentary of Buildings" to revise the earthquake force design standards near fault lines, miscellaneous works, structures, soil liquefaction evaluation methods, and relevant regulations on seismic reinforcement of existing buildings. In line with the Amendment to Article 77-1 of the Building Act, amend the Regulations on Improvement on Existing Building Public Security and Regulations for inspecting and reporting buildings public security, specify the objectives, timing, and benchmarks of improvement, and implement the improvement of the building's earthquake resistance.
- (4) Revised "Recycling Renewable Resource Items and Standards in Construction" in response to the promotion and adoption of new construction methods for asphalt concrete excavation (scrapping) and recycling.

2. Promotion of Green Buildings

In 2022, eleven county (city) governments received subsidies for green building promotion, as well as to establish a green building review and random inspection to maintain the design quality of the building permit, improve the energy efficiency of buildings, reduce energy consumption, maintain the efficiency of green building design and management, and promote the concept of green buildings.

3. Administration of Architects

- (1) A total of 585 applications for training workshop recognition filed according to the Regulations for the Application of Replacement of Architect's Business Practice License and Certification of the Seminar Attendance Documents were received in 2022.

(2) A total of 221 architect licenses were issued in 2022.

4. Condominium Management and Guidance

(1) In 2022, training workshops were organized; 7,704 people completed the training.

(2) In 2022, certificate, license issuance, and license change applications were processed, including 469 applications for interior remodeling business registrations (permissions, registrations, and changes) and 2,570 applications for interior remodeling technician certificates (applications, changes).

5. Administration of Building Interior Remodeling

(1) In 2022, workshops for building interior remodeling technicians were conducted in 99 sessions; 2,867 people qualified and were issued certificates.

(2) In 2022, certificate, license issuance, and license change applications were processed, including 2,934 applications for interior remodeling business registrations (permissions, registrations, and changes) and 5,464 applications for interior remodeling technician certificates (applications, changes).

6. Promotion of Barrier-free Environments in Buildings

(1) The Training Workshop for Inspectors of Facilities and Equipment for the Disabled in Public Buildings was conducted in 17 sessions; 960 people were issued qualification certificates in 2022.

(2) Supervision of barrier-free environments in building-related affairs was carried out between September 12 and 28, 2022, and random inspections of the barrier-free environments were carried out in 20 new buildings, 60 existing buildings, and 14 locations with connected arcades over at least 100 meters in length.

7. Protection of Public Safety in Buildings

(1) Inspections of public safety in buildings

① Annual building public safety inspections were completed in October 2022, and visits were subsequently made.

② In 2022, the Summer Youth Protection–Youth Project Action Plan was implemented to urge local governments to step up public safety inspections at locations frequented by the youth during the summer; inspections were carried out at roughly 3,929 locations.

③ In 2022, local governments were urged to conduct public safety inspections in large department stores, shopping malls, and hypermarkets during anniversary sales and before the Chinese New Year holiday. Inspections were carried out in 612 locations.

(2) Random inspections of 240 mechanical amusement park facility items at 29 locations were conducted in 2022.

(3) Completed 2022 national signboard advertisements, established advertisement safety inspections, and handled the supervision business.

(4) In 2022, 37 applications for approvals on the review report of fire safety and evacuation in buildings and 677 fire-retardant building material certificates were issued.

(5) In 2022, applications for issuing or changing public inspection certificates were processed. Certificate applications from 11 professional inspection organizations (issuance, renewal) and inspector certificate applications from 433 individuals (issuance, renewal) were processed.

8. Building Disaster Prevention and Relief Work

(1) In 2022, post-disaster dangerous building assessment drills were conducted, in which 606 people participated.

(2) In 2022, the plan for registering and utilizing heavy engineering machines was implemented, and 8,475 heavy construction machines and 4,371 operators were registered.

(3) As of the end of 2022, preliminary seismic evaluation was conducted for 30,960 public-owned buildings; seismic evaluation was conducted for 16,565 public-owned buildings; seismic retrofitting was conducted for 9,565 public-owned buildings; and demolition was conducted for 2,289 public-owned buildings, based on the Building Seismic Capacity Evaluation and Upgrade Program.

- (4) Supervised special municipalities and county/city governments in completing safety inspections at 416 controlled slope land housing districts in 2022.

9. Installation and Inspection of Elevators and Mechanical Parking Facilities in Buildings

- (1) In 2022, 3,875 applications for elevator maintenance technician certificates and certificate renewal were processed.
- (2) In 2022, 304 mechanical parking facility maintenance technician certificates and certificate renewal applications were processed.

10. Promotion of Arcade Walkway Leveling

- (1) Eleven special municipalities and county/city governments received NT\$85.88 million of subsidies in total from the General Plan for Improvement of Town Appearance—the Building Arcade Walkway Leveling Promotion Project for the engineering of road sections requiring leveling; a total length of 334,706 meters of arcade walkway were leveled in 2022.
- (2) Random inspections of arcade walkway leveling were carried out on 14 road sections in 2022.

VIII. Public Construction Engineering

1. Continuing to promote a Barrier-free Friendly Environment for Urban Parks and Greeneries

The "supervision plan of barrier-free environments for urban park (2022-2023)" was promulgated on July 29, 2022. Based on this plan, the local government's compliance is supervised. The Construction and Planning Agency has completed the urban group A (six municipalities) and group B (three cities of Keelung, Hsinchu, Chiayi) already in 2022, continuing this plan in 2023.

2. Efforts to Acquire Reserved Lands for Public Facilities and Non-levied Roads

- (1) The MOI continues to promote its Processing Plan for the Issue of Reserved Lands for Public Facilities by using land use conversion, unified development, transferable development rights, exchanging for public land with private reservation land for public facilities, urban renewal, and encouraging investment to solve land reservations for public facilities problems.
- (2) The MOI continues to promote its Processing Plan for Judicial Interpretation Number 400 of Acquiring Lands of Constructed but Non-levied Roads to the local governments to deal with constructed but non-levied roads.

3. As of the end of 2022, 344 common ducts have been planned or constructed by local governments among municipalities, counties, and cities over the entire country. These include main ducts with a length of 104.73 km, branch ducts totaling 359.31 km, CAB totaling 87.39 km, and C.C.Box totaling 4,256.04 km.

4. Promote the "National Land Information System Public Facilities Pipeline Database - Public Facilities Pipeline Database and Management Application System Construction Project". As of the end of 2022, local governments have completed the construction of pipeline databases in urban planning areas and the cumulative construction of 16 million metadata images.

5. Sewerage Construction and Management

- (1) Sewerage-related regulation issues

Three sewage-related autonomous regulations based on the Sewerage Law and Local Government Act were reviewed in 2022, and 5 administrative rules were established, including public sewage treatment plant data transmission, sewerage public notices, engineering quality, occupational safety, and pipeline maintenance. Additionally, we revised and compiled 3 technical manuals related to sewerage for various

county and city governments to follow and implement.

(2) Conducting seminars, education, and dissemination

Inviting experts and scholars from various sectors, including industry, government, and academia, to jointly explore wastewater treatment technology and recycled water development topics, we organized five seminars in 2022, such as Sewerage Construction and Denitrification Technology. Under compliance with the COVID-19 epidemic prevention policy, two training sessions were completed in the Northern region, and one training session was completed in each of the Central and Southern regions, with 250 people trained and qualified in 2022. These participants must be qualified as water pipe installation technicians or sewage drainage facility installation technicians in advance.

To make people understand the policies and concepts of sewerage and water reclamation and to raise public awareness of sewerage and related facilities, we have published "Digging Up. The Urban Water Impact - A Documentary of Sewer Construction" and "Sewerage. Water Recycling Journal." We have also organized a "From contaminated Water to useful Water: Discovering Usage Water in Daily Life" four-panel story contest to encourage public participation and enhance public awareness of the importance of sewerage and recycled water.

(3) Achievements in the construction of sewage systems

According to the "6th Stage of the Sewer Construction Plan (2021-2026)", as checked and ratified by the Executive Yuan, the MOI continues promoting the construction of the entire country's sewage systems. The construction expenditure is estimated to be NT\$106.8 billion over six years. The 2022 annual budget from the central government is NT\$14.36 billion. In addition to continuing to build sewage systems to maintain the performance from previous results to upgrade the national competitiveness, continue environmental sustainability, consider the functions of intelligence and disaster prevention resilience, and promote the strategy of "Continuous Public Sewerage Sewer Construction" and "Construction of A Sustainable and Intelligent System", we hope to gradually build a complete "New Generation of Sewage Sewer Circulation System".

As of the end of 2022, there were a total of 90 public sewer systems under construction, 81 public sewage treatment plants had been established, the cumulative number of households connected to sewage systems reached about 3.75 million, and the public sanitary sewer connection rate was 41.26%; for New Taipei City it was 72.06%, Taipei City 87.28%, Taoyuan City 22.33%, Taichung City 25.6%, Tainan City 26.28%, Kaohsiung City 49.01%; the total of the Taiwan Province was 16.53%, and Fujian Province was 40.15%. The specific sanitary sewer setting rate was 9.68%, and the building sewage processing facilities setting rate for households was 17.74%. The total sewerage treatment rate was 68.68%.

(4) Promoting the reclamation of the effluent from municipal wastewater treatment plants

Regarding water recycling, the MOI is promoting the implementation of the "Reclaimed Water Promotion Plan of Public Sewage Treatment Plant (2021-2026)", and the promotion results at the end of 2022 are as follows.

① As of the end of 2022, there are three cases: Fengshan in Kaohsiung, Linhai, and Yongkang in Tainan, supplying 45,000, 33,000, and 8,000 cubic meters of reclaimed water daily, respectively, with a total daily supply capacity of 86,000 cubic meters. Additionally, six cases, including Anping in Tainan, Rende, Futian in Taichung, Shuinan, Taobei in Taoyuan, and Qiaotou in Kaohsiung City, are currently under construction.

② The promotion of recycled water projects is based on water demand expansion. In January 2023, a project modification was submitted for review by the Executive Yuan. In addition to the existing 11 projects, 5 new projects were added, totaling 16 projects. Among those, the projects that involve

six water demand expansions include Taoyuan Taobei, Hsinchu Zhubei (Keya, Zhudong Joint Supply), Tainan Yongkang, Tainan Anping, Kaohsiung Fengshan, and Kaohsiung Nanzih. The six new projects are Taoyuan Wenching Shuiyuan, Taoyuan Zhongli, Taichung Lian Supply Zhongke, Chiayi County Expanding the County, and Kaohsiung Qiaotou. The goal is to supply 285,000 cubic meters of recycled water daily by the end of 2026, with a total daily supply capacity of 628,100 cubic meters.

(5) Achievement in the construction of stormwater systems

In accordance with Phase 3 (2021-2022) of the Executive Yuan's Forward-Looking Infrastructure Construction Plan for the Improvement of County and City Managed Rivers and Regional Drainage, a budget of NT\$5.65 billion to handle the construction of stormwater sewer systems and to work on the

improvement of stormwater sewer watercourses, system planning, and pipeline surveys in phases, to continuously improve the bottlenecks of flooding in urban planning areas, to add drainage facilities such as stormwater sewer systems, pumping stations, and to implement the total urban concept of water control, several flood detention ponds have been built to improve urban drainage efficiency and reduce flooding probability.

In addition, in response to the risk of urban flooding caused by extreme weather, MOI has set aside NT\$2 billion under the Urban Comprehensive Flood Control Management Construction Project (2022-2026) to handle innovative urban flood control planning, urban intelligent water monitoring, related regulatory adjustments and non-engineering measures, and maintenance and management of pumping stations in the

Tamsui River Basin, etc. It is expected that through the overall consideration of drainage facilities in the region and with technological monitoring and transmission facilities, MOI will use big data analysis to develop the best drainage facility joint prevention and operation mechanism or provide effective and feasible flooding improvement solutions to raise the overall urban flood protection standard. In 2022, six municipalities have been commissioned to complete the urban smart water monitoring contracting operation. In the following year, it will gradually be expanded to 16 other county (city) governments to handle real-time water level monitoring of urban stormwater drainage systems and improve flood protection accuracy.

As of the end of 2022, the total length of storm sewer construction in the whole country was 5,658.48 km, the implementation rate of storm sewers was raised to 79.81%, and flood detention reached 602,500 cubic meters. It will keep operating the storm sewer system's planning and construction to expand the effectiveness of water management and enhance the city's efforts for flood prevention in 2023.

6. Promoting Road Construction and Maintenance

(1) Carry out the regional-based road system construction plan

The "Construction Plan of Road Traffic System in Living Circles (Urban Roads) for 6 Years (2022- 2027)" mainly focuses on the new development and expansion of urban roads, together with the construction of the urban disaster prevention system. It aims to strengthen the accessibility of important assembly points, promote people-oriented, environmentally-friendly roads, improve the efficiency of existing transportation systems, and cooperate with policies to solve important local traffic problems. The budget allocated for this plan is NT\$ 6.637 billion in 2022 and NT\$ 6.632 billion in 2023. These projects are planned to construct the urban expressway system and achieve the goal of nationwide one-day living areas.

(2) Road/street quality improvement plan

The plan is to handle road quality improvement projects, improve urban road services quality, and provide road users with a dignified, safe, comfortable, and barrier-free road environment. It subsidizes local governments through public construction and friendly environmental planning. The third phase of the plan includes the re-examination of the existing indicators and improvements according to the five major themes: "Human-Centered Environment", "Green Transportation", "Ecological Road Network", "Smart Construction", and "Education and Publicity." In addition to the continued promotion of existing road quality improvements, it introduces several new indicators. Furthermore, a comprehensive review of measures created several new indicators for a safe and unhindered traffic environment, such as revitalizing public land, education, and publicity.

IX. Development of New Towns

1. Danhai New Town

The planned area is 1,748.75 hectares, and the first development phase covers 446.02 hectares, which was implemented in 1991. About 180 hectares of land have been acquired for the use of public facilities and transferred to New Taipei City. Furthermore, the city has been offered approx. NT\$1.0 billion by the MOI for maintenance. 135.35 hectares of raw land have been sold as of the end of 2022, and the remaining lands will be managed according to governmental policies. To incorporate the development of residential areas and industrial areas, public utilities, and transportation, the New Town Development Fund of the MOI has, since 2007, funded the Water Supply Project with NT\$3.76 billion, the Light Rail System with NT\$7.09 billion, and the Danjiang Bridge Project with NT\$6.62 billion, etc. Furthermore, the CPA started planning the Master Plan of Danhai New Town (third review) in 2019 to use the planning procedure as a platform for further discussion with New Taipei City and to embrace the concepts of low-impact development and smart cities. Major planning issues include the review of industrial lands and the redevelopment of the deteriorated built areas of the Masterplan of Danhai

New Town.

2. Kaohsiung New Town

The planned area is 2,159.20 hectares, and the first development phase covers 331.88 hectares. About 76.08 hectares of land were acquired for the use of public facilities and transferred to Kaohsiung City. As of the end of 2022, 53.02 hectares of raw land were sold, and the remaining lands will be managed according to governmental policies. Moreover, since 2021, the CPA has been drafting the Masterplan of Kaohsiung New Town (The Third Overall Review) according to the development needs.

In accordance with the Executive Yuan's policy of establishing Kaohsiung Qiaotou Science Park, the CPA has been conducting the compensation equivalent lands allocation process in stages since July 2022. Meanwhile, the public works of zone expropriation started in July 2022 and are expected to be completed in June 2025. The CPA will continue the relevant works in 2023, including announcing the allocation results of compensation equivalent lands, new access road construction, and public works of zone expropriation. In addition, to accelerate the investment in the development area in Kaohsiung New Town, determining the range of industries favorable for development is also in progress.

3. Linkou New Town – Development of A7 Station District of Taoyuan Airport MRT

The planned area is 184.57 hectares, and raw lands of 52.47 hectares were sold up to 2022, and the remaining lands will be managed according to governmental policies. About 62.19 hectares of land were acquired for the use of public facilities and were transferred to Taoyuan City. In 2022, the construction of the no.10 projects for rainwater manhole addition and maintenance began, complete the urban plan change operation in coordination with the zone expropriation operation, and subsidize the Taoyuan City Government to obtain the necessary funds for the land use for the out of zone expropriation area road (Change 1 and Change 2). In 2023, the CPA will continue working on the Construction of the No. 7 Public Square Project, the design and construction of the No. 9 Public Park (used as detention pond as well) drainage and waste removal project, completion of the No. 10 projects for rainwater manhole addition and maintenance, etc., which are favorable for the New Town Development. Moreover, it will continue to handle the urban plan changes and need to be registered with the Taoyuan City Government free of charge and allocated to the Taoyuan City Government to build social housing and land takeovers and to subsidize the Taoyuan City Government to handle out-of-zone expropriation area roads (Change 1).

X. Urban and Rural Development Works

1. Establishment of the Spatial & Urban Planning Education and Research Platform

To cultivate professionals in land planning, the CPA established the “SUPER Platform” for planning centers in the North, Central, South, East, and Outlying Island regions. This platform provides colleges and universities with courses related to spatial planning and promotes cooperation across regions, industries, and the academe. The SUPER Platform also shares the resources and experiences of various schools, helping participants obtain relevant knowledge efficiently. Concurrently, the CPA prepared a budget for the follow-up promotion of spatial planning. This budget encourages teachers and students in colleges and universities to develop relevant research, creative proposals, or new technologies.

2. Integration and Establishment of the Database and Information System of National Territorial Planning

- (1) The Urban and Rural Development Branch Agency (URDBA) of the CPA, MOI, continuously integrates and maintains the national territorial planning and land use zoning database information system to meet the operational requirements of related planning and the recovery planning for national territories, regional areas, and urban-rural areas. In 2022, the territorial planning and land use zoning database information system was used 20 million times.
- (2) In 2022, the construction of a public urban planning land use zoning certificate issuance system was completed, and it was provided for use by the various township and city offices in Changhua County.
- (3) During 2023, the CPA will continue to update the database and coordinate with the National Land Use Planning Act (NLPA) in spatial platform integration and database standardization.

3. Continuing to Promote the Wetland Conservation Act and Rolling Out Related

Measures to Protect Wetland Environments

The Wetland Conservation Act came into effect on February 2, 2015, and the National Wetland Conservation Guide was filed for future reference on March 31, 2017, by the Executive Yuan as the basis for overall planning and promotion of wetland conservation. The MOI has continued to institutionalize wetland conservation. As of 2022, 44 of the Wetlands of Importance conservation and utilization plans have been announced. Furthermore, 39 of the temporary Wetlands of Regional Importance finished their evaluations. Furthermore, 24 subsidy cases were approved for local governments to handle wetland conservation, and 3 cases on using the wetland insignia were permitted in 2022. Activities have been completed, such as the "2022 Wetland Science Seminar" and "2022 Taiwan Wetland Research Camp." In 2023, the MOI will continue to advance the legal process, including reviewing the National Wetland Conservation Guide and the Wetland of Importance Conservation and Utilization Plans and handling related implementation

tation plan work items. Moreover, the MOI will guide wetland-friendly industries to apply for wetland insignia and strengthen interaction with communities near wetlands.

4. Establishing and Promoting the Goals of Sustainable Development for National Land Resources and Urban and Rural Development

In cooperation with the National Council for Sustainable Development, the Ministry shares the responsibility of the Sustainable City Working Group, taking the SDGs of the UN and domestic conditions of Taiwan as a reference to develop the SDGs, making cities and human settlements inclusive, safe, resilient, and sustainable; to make the relevant measuring indicators and to continuously track and review their implementation.

5. Urban Planning

The projects Planning for the Specific District Plan of Linkou (Fourth Comprehensive Review), Scenery-specific Area Plan of Dapeng Bay (Third Comprehensive Review), the Specific District Plan of Linkou (the Comprehensive Review of Public Facilities Projects), the Scenery-specific Area Plan of the Northeast Coast (Fourth Comprehensive Review), the Newly Constituted and Extended Urban Planning of Dahan Stream South (Tucheng District) (Tucheng Ammunition Dump and Nearby Area as the Park of Justice) and rezoning the Specific District Plan of Taoyuan International Airport Park and Nearby Area (first stage) (coordinating with residential zone 1 of 4 community) are under execution. On the other hand, under Article 26 of the Urban Planning Law, the MOI is assisting various local governments in handling their urban planning projects. There is an average of 10 comprehensive urban planning reviews and several renewal reviews among various locations every year.

6. Land Use Monitoring

The Executive Yuan approved this plan in September 2014 mainly to integrate the Construction and Planning Agency, Soil and Water Conservation Bureau, and Water Resources Agency's related monitoring plans. Satellite imagery and image transition detection technology have been used as auxiliaries for illegal land use investigation and to gather emergency hazard information. During land use monitoring, which was implemented from 2014 to 2022, a total of 72 national-level, 18-year satellite monitoring projects focused on coastlines and sea areas, have been completed. Additionally, 127 periods of high-frequency monitoring in river areas have been completed as per the needs of the Water Resources Agency. In 2022, the illegal land use investigation number greatly increased to 10,423 places, showing the effectiveness of defending land violations and preventing the destruction of our country.

7. Land Inventory and Planning of Central-Government-Built Social Housing

To complete the goal of providing 200,000 social housing units in 8 years, including 120 thousand government-built social housing units before 2024, CPA has carried out the land inventory and planning of central-government-built social housing sites. After consulting with land management agencies and local government to confirm the availability of land and the opinions on local development of selected sites, the Ministry instructed the Nation Housing and Urban Regeneration Center to build social housing. The number of plots has totaled more than 200 sites.

XI. Architectural and Building Research

The Architecture and Building Research Institute (ABRI) aims to promote building safety, improve the quality of the living environment, upgrade construction technologies, excel in urban development, and hold

presentation workshops to promote research results.

1. Technology Program for the Elderly to Live in a Peaceful and Respectful Environment

This technology program mainly deals with environmental planning for the elderly, the design of social housing environments, social and environmental laws and regulations related to the elderly, and research on the mobility and environment of the elderly. From the perspectives of construction environment and urban environment transformation, a vision of the urban, architectural, and community life for an aging society is proposed to establish a "living environment for safety and respect for the elderly". The results of the implementation of the program in 2022 are as follows:

- (1) Completed 11 research studies: Guidelines for Epidemic Prevention and Safety Improvement of the Elderly Home Environment, Demand for Improvement of Existing Residential Space for the Elderly, Integration of Social Housing and Coexisting Communities Care Space Environments, Analysis of the Current Situation, Trends, and Strategies of the Living Environment of the Elderly and Vulnerable in Taiwan, Anti-slip Performance of Vestibule Flooring in Various Places of Use, Comparison of the Laws on the Improvement of Accessibility of Buildings with the Use of Information and Communication Technologies in the U.S., Japan, and Taiwan, A Preliminary Study on Safety Design Standards for Foreign Gravity-Type Zipline Motion Structures, Key Points of Pathfinding Design for Friendly Living Areas for the Elderly and Those with Mildly Cognitively Impaired, Home Care for Parkinson's Disease Patients in the Elderly's Home, Intelligent Whole-Person Disaster Prevention and Warning System for Home, and Survey on Intelligent Barrier-Free Guide Facilities for the Visually Impaired in Indoor Public Spaces.
- (2) The research results of this program led to the promotion of the "Guiding Principles for Anti-Slip Coefficients or Grades of Floor Tiles in Buildings". Local governments can refer to the guiding principles to make their decisions and formulate anti-slip regulations tailored to local conditions. Public projects can incorporate anti-slip coefficients or levels into contract requirements based on the needs of individual cases and refer to the guiding principles.
- (3) Assisted the K-12 Education Administration of the Ministry of Education in formulating "Key Points for the Installation of Accessible Facilities and Equipment in Public Schools Below Senior High School and Special Education Schools" and "Instructions for Inventory Operation of Accessible Facilities and Equipment in Public Schools Below Senior High School and Special Education Schools" to improve the accessibility of campus environments.
- (4) Participated in the "ATLife Taiwan 2022 Assistive Technology for Life", showcasing the results of the research and promotion of senior housing, senior-friendly environments, and therapeutic environments, which were recognized and affirmed by the public and the industry.

In 2023, this research program will carry out the planning and design of accessible housing units in social housing, the planning and design of day-care center buildings, and research on the introduction of intelligent safety protection equipment into the living spaces of the elderly to provide the Ministry with a reference for policy promotion.

2. Fire Safety of Buildings

Research, promotion, and application of building fire safety design and technology were carried out to maintain public safety in buildings. The related implementation results in 2022 are as follows:

- (1) Completion of 14 studies, including the "refinement of fire prevention countermeasures and regulations", "application of building sustainability and intelligent technology", "universal evacuation design and innovative technology", "improvement of fire prevention and smoke control performance and innovative technology", and "advanced research of fire compartments and steel structural fire resistance technology", of which 6 papers were published in international and domestic academic journals, and 24 were presented in international and domestic conferences/seminars.
- (2) A technology transfer case involving the "Smoke Simple Two-Layer Certification Software" was completed, and the aforementioned STDF project "Improvement Research of Smoke Simple Two-Layer Certification Method" was conducted.
- (3) The patent technology transfer of "Sound-Light Composite Non-Destructive Detection Technology for Fire Damage of Reinforced Concrete Components" was authorized for free. The technology is for application by the New Taipei City Fire Bureau to 10 fire investigation cases of fire-damaged RC buildings and for providing scientific data reference for auxiliary determination of indoor fire temperatures.

- (4) The Fire Experiment Center (FEC) of ABRI has completed fire testing services for the domestic building materials industry, conducted approximately 355 research experiments, and completed 189 testing service cases, with annual revenue totaling NT\$ 4,861 thousand, which was fully submitted to the national treasury. In addition, FEC cooperated with the Taiwan Architecture and Building Center (TABC) and the Underwriters Laboratories Inc (UL) to conduct the international witness test certification program on UL 2043 (Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces).
- (5) Conducted 5 promotional activities, such as the "2022 Fire Safety Technology Innovation Seminar", with approximately 580 participants
- (6) Completed the publication of three volumes of "Large Space Building Fire Performance-based Smoke Control System Design and Application Manual 2nd Edition", "Guidelines for On-site Smoke Prevention Performance Testing of Doors" and "Technical Reference Manual for Fire Protection Design of Steel Structure Buildings", and provided reference applications for the construction industry and technical personnel.

In 2023, research on the fire safety countermeasures of indoor electric vehicle parking space and charging pile equipment, intelligent fire warning and patrol system on large-scale logistics and warehousing buildings, devel-

opment of assessment manual for residual seismic capacity of building structures and study on reinforcement methods after fire damage, fire compartmentation plans for logistics and warehousing building, fire risks and active and passive safety strategies integrating photovoltaic and indoor energy storage systems in buildings, non-combustibility test criteria for

building flame-resistant composite materials, hydraulic calculation verification of fire extinguishing equipment of building, etc., is expected to be conducted.

3. Urban and Architectural Disaster Prevention

To enhance the mitigation, response, and recovery capabilities for urban and building disasters and to conduct research on resilience technology, as well as advocacy and application of building and urban disasters, the following results were achieved in 2022:

- (1) Regarding "disaster resilience planning strategies for development lands of non-urban land into urban and rural development areas of spatial plan", "climate action in flood mitigation and adaptation planning of urban plan in urban and rural development area by watershed view", "application of surface displacement with Monitoring technology by dual frequency and multi-satellite global positioning system in hillside community", as well as "empirical research and big data application of refuge shelters space planning for special needs of elderly vulnerable people after earthquakes", a total of 7 studies were completed. Thus, relevant authorities were provided with the necessary materials to develop policies and regulations for reference during application. 4 papers were published in international and domestic seminars.
- (2) Under the implementation of the Spatial Planning Act, we conducted research on the study of disaster resilience planning strategies for development lands of non-urban land into urban and rural development areas of spatial plan, the study on climate action in flood mitigation and adaptation planning of urban plan in urban and rural development area by watershed view, and researched the situations and countermeasures of construction sites.
- (3) In response to the flood disasters caused by extreme weather due to climate change, based on the needs of urban flood disaster reduction, we researched the overall planning and effectiveness of the smart monitoring system for rainwater storage and detention facilities in buildings were discussed to improve the effectiveness of the rainwater storage system in stormwater management.
- (4) In response to the needs of the elderly society for disaster prevention and safety, we researched the empirical research and big data application of refuge shelter space planning for the special needs of vulnerable elderly people after earthquakes.
- (5) To reduce disasters in hillside communities, we researched and developed smart monitoring technologies suitable for the slopes of hillside communities. We studied the application of surface displacement with monitoring technology by dual frequency and multi-satellite global navigation satellite system (GNSS) in hillside communities.
- (6) To enhance the ability of self-management of hillside communities and promote self-safety and disaster prevention management demonstration and education and counseling promotion in hillside communities, a

total of 10 hillside communities and promotion education have been surveyed and received guidance, 5 workshops on hillside community self-care, 6 Disaster prevention promotion lecture on sloped campuses, 5 promotion education and 3 workshops on community disaster prevention have been completed.

In 2023, the plan intends to implement policies such as the Spatial Planning Act, the Plan of Disaster Mitigation and Rescue Technology Innovation Service, and further research such as "flood mitigation and adaption planning and hydraulic analysis in the urban-rural development zone of spatial planning", "application of wide-area surface deformation radar satellite remote sensing technology for smart disaster prevention system for hillside communities", "disaster resilient strategies and planning procedure for the rural area comprehensive planning", "introducing smart monitoring operations for detention facilities in buildings", and "application of big data in the study of evacuation and shelter space in the urban disaster planning process" is to be conducted.

4. Building Engineering Technology Development and Integration Application Plan

To promote the development of the domestic construction industry and improve the technology and quality of construction engineering, the "Building Engineering Technology Development and Integrated Application Plan". Relevant parameters were proposed to develop the new domestic steel structure design specifications that meet Taiwan's load and engineering characteristics. In conjunction with the "Floating Volcano Pumice Response Project" of the Executive Yuan, the research on the application technology of pumice in building materials was implemented. With the theme of "Give Way to the Wind, Repel the Heat Island, and Return the Original Formosa", the ABRI participated in the 2022 Presidents Cup Hackathon Activities. The team was selected (top 20) in the preliminary review. The execution results are as follows:

- (1) Carried out 3 research projects, including the seismic tests of the connections of the encased and infilled steel reinforced concrete columns and the beam longitudinal bars with couplers, so that the design and construction units can follow test results to ensure the seismic performance of the building structure and the safety of people's lives and property.
- (2) Carried out 2 research projects, including fiber concrete durability research, and conducted research on the application of pumice in building materials.
- (3) Implemented 3 research projects, including load combination and simple wind correction according to building wind resistance design specifications, wind-induced vibration test measurement, analysis and verification of full-size solar photovoltaic panels, and used technology and urban planning regulations to create city ventilation corridors to reduce the urban heat island effect, adjust urban high temperatures, and create a ventilated and livable city.
- (4) Published the "Technical Reference Manual for Seismic Retrofit of Reinforced Concrete Building Structures" and "Wind Resistant Design Manual for Curtain Wall Structural Systems" to provide convenient design tools for reference and to improve the earthquake and wind resistance of domestic buildings and the safety of residents.

Starting in 2023, the "Construction Engineering Technology Advanced Innovation and Application Efficiency Improvement Plan" will continue to use the energy of national laboratories to revise relevant technical regulations, develop patents and applications, and develop technical manuals and other multifaceted results to conduct experimental research on economical parameters of continuous plates in steel reinforced concrete structural columns, preliminary research on seismic resistance evaluation and retrofit of non-structural buildings, and wind verification test methods for extreme design of solar panels.

5. Building Information Integration and Application Enhancement Project

In order to promote Building Information Modeling (BIM) technology, enhance information management and circulation throughout the entire lifecycle of a building, and improve efficiency in the planning, design, construction, and maintenance stages, the project aims to boost building quality, usage efficiency, upgrade the construction industry, and promote sustainable environmental development. The achievements for 2022 are as follows:

- (1) Coordinated with the National Development Council to establish a 3D national map, popularizing the application of digital spatial technology to enhance the efficiency of land information utilization. This aligns with the promotion of government digital services, data governance, and the intelligent management of social housing operations. In conjunction with the development of smart cities, the project provided solutions for field application service providers and transportation service providers to operate smart cities safely, conveniently, and comfortably. This involved the application of Building Information Modeling

(BIM), deep learning, and automatic recognition technology to assist in precise installation of building components, establishment of a localized BIM knowledge platform, formulation of sustainable operational strategy research, research on the application of BIM and extended reality (XR) technology in firefighting and disaster relief assistance systems, and localization of Building Information Modeling open-source and free software (BIM FOSS) development and application, among four projects.

- (2) Conducted online seminars for presenting research results and holding explanatory meetings on the precise installation of building components aided by Building Information Modeling (BIM), deep learning, and automatic recognition technology. Established a localized BIM knowledge platform forum and organized BIM talent training courses, promoting the application and advocacy of BIM within Taiwan.
- (3) Continued to enrich the content of the component-sharing portal, guiding the industry in adopting BIM technology and accelerating information flow and practical experience sharing.

Completing the "Interdisciplinary Integration and Innovative Application Plan for Building Information" achieved three major policy goals: digital transformation of the construction industry, development of the foundation for digital cities, and development of the foundation for digital government. We will continue to hold seminars to promote BIM applications within Taiwan. In 2023, with the theme "Unlocking the Code of Low-Carbon Buildings, Pioneering a Net Zero Carbon Emission World", we participated in the 2023 President's Cup Hackathon. During final selection, our team was selected as an outstanding team (top 5, in no particular order), earning the honor of an award presented by the President.

6. Intelligent Green Building Regulations Research and Training Program

To popularize intelligent green buildings, promote energy conservation and carbon reduction benefits, and encourage private units to construct intelligent green buildings, the MOI handles the relevant administrative revisions, the approval of labels, the selection of outstanding awards, visits, lectures, and other promotional work. As a result, the MOI accomplished several related achievements in 2022, which are as follows:

- (1) Announced the revised Administrative Directions of Applying for Approval of Green Building Label and introduced the Building Energy-Efficiency Rating System.
- (2) In total, 1,038 buildings or building projects were certified as Green Buildings; 237 buildings and building projects were certified as Intelligent Buildings; and 327 Green Building Material Labels were certified. As a result, the estimated annual savings are 0.26 TWh of electricity and 14.43 million tons of water, roughly equal to 1.055 billion NTD.
- (3) 9 outstanding awards were awarded in the 3rd Outstanding Intelligent Building competition to commend remarkable industries or architects.
- (4) Organized 3 workshops and visits with 667 participants on building energy-saving technology and published the "Guide to Energy-Saving Technologies for Nearly Zero Carbon Buildings". During the workshops, demonstration and promotion were achieved through practical cases.

In 2023, this program will continue to issue Green Building, Green Building Material, Intelligent Building, and Building Energy-Efficiency Label certifications and promote the cases and applications related to intelligent green building policies.

7. Innovative Circular Green Building and Environment Technology Plan

For developing green building technologies that are suitable for the subtropical climate in Taiwan, there are several execution strategies in the 2022 "Innovative Circular Green Building and Environment Technology" project, such as "Building Energy Conservation and Carbon Reduction", "Sustainable Urban Environmental Technology", "Circular Building Methods and Material Technology", and "Green Building Promotion and Advocacy". The major achievements in 2022 are as follows:

- (1) Completed the "research on the legalization of building energy efficiency assessment and labeling", "research on analyzing the real estate value of green building label buildings based on big data", "Feasibility Study on Incorporating Groundwater Reuse into Green Building Assessment System during Construction Site Construction", "Research on Net-Zero Emissions Strategies and Carbon Reduction Potential in the Residential and Commercial Sectors", "Research on the evaluation of material recycling degree of building circular design components" and other related research, totaling 15 cases.
- (2) Completed the draft of the "Technical Specifications for Energy Efficiency Design of New Buildings".
- (3) Completed the introduction of circular economy development concepts in architectural planning and design

methods and structures for reference by related industries.

- (4) Completed the draft of "Guidelines for the Design of Same Floor Drainage Systems of Buildings" for reference by relevant industries.
- (5) Completed the 7th Green Building Drawing Competition and held an award ceremony on December 10th. 994 entries were registered, and 209 works were selected as winners.

In 2023, in line with the overall policy goal of "Constructing a Sustainable and Livable Environment" of the Ministry of the Interior, the "Sustainable Healthy Green Building Environmental Technology Plan (1/4)" will focus on the four main axes of "sustainable green building energy-saving and waste reduction technology research and devel-

opment and application", "healthy green building indoor environment technology development", "sustainable environment and ecological city development", and "sustainable green building regulations and education promotion". It will use technological innovation to create a sustainable and livable environment, improve

the quality of living, and comprehensively move towards the goal of maintaining the sustainable environment of the land.

8. Artificial Intelligence Technology Applied to Intelligent Living Space Development and Promotion Plan

We are promoting intelligent applications based on the development advantages of Taiwan's ICT industry. The projects implemented in the development of the intelligent living space industry in 2022 are as follows:

- (1) Completed the "Application of User-centric Control Technology to Enhance the Energy Efficiency of Intelligent Buildings" and other related research, totaling 7 cases.
- (2) Completed a draft of the "Application Manual of Remote Monitoring Technology for Intelligent Elevating Equipment" to provide reference for related industries.
- (3) Operated and updated the Intelligent Living exhibition hall I-Life 4.0 in Taipei, Taichung, and Kaohsiung and expanded the display of AI projects, attracting over 58,000 visitors with the total number of visits exceeding 525,000 over the years.
- (4) Held the 15th intelligent building design competition, and 20 winning entries were selected to encourage innovation in industry, academia, research, and youth participation. In addition, 12 physical technical activities and 13 online technical activities were held. About 1,452 attendees participated in these events.
- (5) The "Guidelines for Building Facility Management in Intelligent Buildings" was published to provide the industry's concepts and infrastructure related to facility management systems, facilitate communication between architects, owners and facility managers, and cultivate intelligent building talents.

In 2023, this plan continued to follow the planning of the Artificial Intelligence Internet of Things (AIoT) Technology for Intelligent Living Spaces (2023-2026) to develop innovative technologies for AIoT applications in construction, introduce AI, IoT, big data, and cloud computing technologies, and promote innovative and integrated applications in the intelligent living space industry as well as demonstration centers for publicity and promotion to expand the application of AIoT intelligent living technology and promote the development of the intelligent living space industry.

