Document of the Chinese Society for Geodesy Photogrammetry and Cartography

Notice on Organizing the Third "Tianshu Cup" Innovation Competition for Smart City Applications Empowered by Space-Air-Ground Integrated Information Technology

To all relevant organizations:

To fully implement the arrangements of the 15th Five-Year Plan, vigorously advance the Digital China initiative, leverage space-air-ground integrated information technology to promote innovative smart city development, accelerate the establishment of a next-generation information infrastructure system, and foster the integrated and coordinated development of frontier technologies, application scenarios, and industrial chains, the Chinese Society for Geodesy Photogrammetry and Cartography (CSGPC) has decided to organize the Third "Tianshu Cup" Innovation Competition for Smart City Applications Empowered by Space-Air-Ground Integrated Information Technology (hereinafter referred to as the "Competition") from June to November 2026. The relevant matters are hereby notified as follows:

I. Organizational Structure

(I) Organizer

Chinese Society for Geodesy Photogrammetry and Cartography

(II) Organizing Institutions

Smart City Working Committee of the Chinese Society for Geodesy Photogrammetry and Cartography

Sichuan Society for Surveying, Mapping and Geographic Information

(III) Supporting Organizations

Cartography and Geographic Information Systems Committee of the Chinese Society for Geodesy Photogrammetry and Cartography

Low-Altitude Development and Utilization Working Committee of the Chinese Society for Geodesy Photogrammetry and Cartography

Photogrammetry and Remote Sensing Committee of the Chinese Society for Geodesy Photogrammetry and Cartography

International Society for Urban Informatics

Zengcheng District Data Element Industry Association

Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences

Aerospace Information Research Institute, Chinese Academy of Sciences

National Key Laboratory of Surveying, Mapping and Remote Sensing Information Engineering

Human Settlements Information Laboratory, Tsinghua University

Otto Poon Charitable Foundation Smart Cities Research Institute, The Hong Kong Polytechnic University

Hongyi Honor College, Wuhan University

Nanjing University

Sun Yat-sen University

Central South University

China University of Geosciences (Wuhan)

Beijing University of Technology

Guangzhou University

Chengdu University of Technology

Yellow River Conservancy Technical University

Jiangsu University of Architectural Technology

Zhejiang College of Construction

Beijing Polytechnic College

Shanghai Vocational College of Construction Management

Shanghai JiGuang Polytechnic College

Glodon Company Limited

Urban and Rural Planning Institute (Guangzhou) Co., Ltd.

Beijing SuperMap Software Co., Ltd.

Sichuan Southwest Jiaotong University Railway Development Co., Ltd.

Zhongke Satellite Technology Group Co., Ltd.

II. Organizing Committee

Chair: Zhang Shaojie

Vice Chairs: Zhang Yun; Ma Zhiyong

Members: Qi Yang; Li Jie; Wang Jianwu; Cao Kaibin;

Chu Qin; Li Ping; Yu Feifei; Zhou Zhao

III. Academic Advisory Committee

Chair: Deng Zhongliang

Vice Chairs: Shi Wenzhong; Wu Lun; Zhang Xinchang; Lu Feng;

Dang Anrong; Ma Zhiliang; Tang Luliang; Zhang Jianchun

Members (listed alphabetically by surname):

Chen Jie	Chen Yiping	Chen Xiangdong	Fu Bo	Jiang Yifang	Li Shaoda
Li Shaoying	Li Junfeng	Li Yadong	Liu Zhansheng	Meng Qingyan	Nian Lihui
Wang Di	Wang Dongmei	Yao Yao	Xi Guangliang	Yang Zhigao	Yue Hua
Zhang Hengcai	Zhang Wei	Zhao Xin	Zhou Jing	Zhou Jingchun	Zhu Changqing

IV. Competition Theme and Tracks

The theme of this Competition is “Mapping a New Vision for Smart Cities · Advancing toward the Future through Integrated Innovation.” Eight competition tracks have been established to form an end-to-end competition framework covering the entire chain of “data acquisition—processing and analysis—industry applications.” The tracks are:

(I) Smart City Innovation Applications

(II) AI-Empowered Smart City Governance

(III) Remote Sensing and Digital Twins

(IV) BIM + Smart City Digital Twin Applications

(V) Digital and Intelligent Empowerment for Urban Renewal

(VI) Integration of the Low-Altitude Economy and Smart Cities

(VII) Intelligent GIS Applications

(VIII) Integration of Data Elements and Smart City Applications

The Competition aims to stimulate participants’ innovative potential in frontier areas of smart city development and accelerate the transformation of technological achievements into practical applications. Detailed descriptions of the individual tracks are provided in the Appendix.

V. Eligible Participants and Team Formation

(I) Eligibility

The Competition is open to participants worldwide. Eligible domestic participants include all types of higher education institutions (including vocational colleges), research institutes, and enterprises and public institutions across relevant industries. Overseas universities, research institutes, and other high-quality international industry organizations are also eligible to participate.

(II) Team Requirements

All entries must be submitted by teams. Each team may register for no more than three tracks and may consist of no more than six members. Each individual may serve as the captain of only one team and may not hold concurrent roles on multiple teams.

Each participating team from an educational institution must appoint one designated faculty advisor.

(III) Orientation of Submissions

Submissions from teams representing educational institutions should emphasize creative design and technological innovation. Submissions from enterprises, public institutions, research institutes, and other non-academic teams should place greater emphasis on practical deployment value, tangible economic benefits, and social impact.

VI. Competition Schedule

June 2026: Official launch of the Competition; release of challenges and rules

September 30, 2026: Registration deadline

October 31, 2026: Submission deadline

November 2026: Eligibility review, centralized evaluation, and public announcement of results

VII. Awards

The Competition will confer the following overall awards: First Prize, Second Prize, Third Prize, and Excellence Award. An Outstanding Mentor (“Bole”) Award will be presented to the faculty advisors of First

Prize-winning teams from educational institutions.

Winning teams will receive honorary certificates issued by the Chinese Society for Geodesy Photogrammetry and Cartography.

VIII. Evaluation Rules

(I) To ensure that the evaluation process is fair, impartial, standardized, and orderly, an Expert Evaluation Committee will be established.

(II) The Competition will comprise three main stages: eligibility review, preliminary evaluation, and final evaluation.

IX. Registration Method and Procedures

(I) Registration and submission will both be conducted online. Participants shall log in to the official Competition website and complete registration by September 30, 2026, and shall submit their entries by the specified deadline in accordance with the submission requirements.

Official Competition website: https://www.csgpc.org/list/2956.html

Official WeChat account: Smart City Innovation Application Competition

(II) Please follow the official Competition website and WeChat account for further information.

X. Contact Information for the Competition Organizing Committee

Contacts: Yu Feifei; Li Ping

Telephone: 010-68719860; 010-68716602

Email: zhcsgwh@126.com

Appendix: Descriptions of the Tracks of the Third “Tianshu Cup” Innovation Competition for Smart City Applications Empowered by Space-Air-Ground Integrated Information Technology

Chinese Society for Geodesy Photogrammetry and Cartography

June 24, 2026

Disclosure status: Proactive disclosure

Secretariat of the Chinese Society for Geodesy Photogrammetry and Cartography Issued on June 24, 2026

Appendix:

Descriptions of the Tracks of the Third “Tianshu Cup” Innovation Competition

for Smart City Applications Empowered by Space-Air-Ground Integrated Information Technology

I. Smart City Innovation Applications Track

Track Organizers: Sichuan Society for Surveying, Mapping and Geographic Information; Chengdu University of Technology; Shanghai Vocational College of Construction Management; Beijing SuperMap Software Co., Ltd.; Sichuan Southwest Jiaotong University Railway Development Co., Ltd.

Track Overview: Closely aligned with the national strategies for Digital China and next-generation smart city development, this track draws on core technologies including space-air-ground integrated remote sensing, BeiDou positioning, spatiotemporal big data, and AI-enabled intelligent analysis. It focuses on four high-priority practical scenarios: 15-minute convenient living circles, resilient cities, urban lifeline safety, and refined urban governance. With an emphasis on improving public well-being, revitalizing urban spaces, strengthening safety safeguards, and enhancing governance efficiency, the track seeks implementable, reusable, and scalable digital solutions and innovative application systems. Submissions should demonstrate practical relevance, innovation, and deployability, thereby supporting the modernization of urban governance.

Challenge 1: Optimization Planning and Application of 15-Minute Livable Living Circles Based on Spatiotemporal Big Data

The 15-minute living circle is a core public-benefit initiative for improving convenient access to services and strengthening the urban public service system. Participants shall use multi-source spatiotemporal data related to public services and residents' daily lives, including urban road networks, residential community distribution, population heat maps, education, healthcare, supermarkets and shopping centers, fresh-food markets, sports and recreation, and elderly-care services. Combined with space-air-ground sensing technologies and using the area reachable within a 15-minute walk as the core analytical unit, participants shall conduct intelligent analyses of the coverage, accessibility, and spatial balance of neighborhood facilities. They shall accurately identify deficiencies such as missing facilities, uneven layouts, and service gaps; account for local population structure and residential needs; and propose scientifically grounded and implementable plans for adding facilities, optimizing layouts, and upgrading functions, thereby establishing a convenient, balanced, and fully covered 15-minute community service system.

Challenge 2: Digital Solutions for Enhancing Smart City Resilience

Building resilient cities is a central means of strengthening urban disaster prevention and relief capabilities, ensuring safe and stable city operations, and enhancing resilience for sustainable urban development. Key scenarios include the management of urban disaster hazards, resilience upgrades for infrastructure, enhancement of emergency response capabilities, and restoration of ecological resilience. Participants shall use real-scene 3D modeling, remote-sensing time-series monitoring, spatiotemporal big-data analytics, and digital-twin technologies to address priority areas for resilience improvement, such as disaster-prone urban districts, aging infrastructure, and ecologically vulnerable areas. Work should cover hazard screening, risk assessment, resilience-potential analysis, and intelligent simulation of emergency plans, leading to an end-to-end digital solution for resilient-city development. The solution should address shortcomings in conventional resilience programs, including imprecise hazard identification, unscientific risk assessment, inefficient emergency response, and the lack of data support

for operations and maintenance, and should enable more refined, digital, and intelligent resilient-city development.

Challenge 3: Intelligent Monitoring and Early-Warning Applications for Urban Lifeline Safety through Space-Air-Ground Integration

Urban lifelines—including water supply, drainage, gas, district heating, bridges, utility networks, roads, and fire protection—are the foundation of safe city operations. Participants shall integrate satellite remote sensing, UAV inspection, spatiotemporal positioning, AI-based intelligent recognition, and IoT sensing technologies to develop an integrated application solution covering urban-lifeline safety monitoring, risk assessment, intelligent early warning, and emergency response. For frequent risk scenarios such as damaged utility networks, road collapse, bridge hazards, waterlogging and urban flooding, gas safety incidents, and fire hazards, the solution should provide automated hazard identification, precise risk localization, real-time situation monitoring, and advance warning of dangerous conditions, thereby establishing an all-weather, full-coverage protection system for urban lifelines and reinforcing the baseline of urban safety.

Challenge 4: Innovative Applications for Citywide Refined Smart Governance Based on Spaceborne and Airborne Technologies

To address the shortcomings of conventional urban governance—including extensive rather than refined management, inefficient inspections, delayed problem detection, numerous regulatory blind spots, and disorganized records—participants shall use remote-sensing monitoring, high-precision BeiDou positioning, AI-based visual recognition, and spatiotemporal big-data technologies. Solutions should target community-level governance scenarios such as urban appearance and environmental sanitation, control of unauthorized construction, construction-site supervision, waste sorting, unauthorized occupation of public roads, dust control, operation and maintenance of municipal facilities, and charging-facility management. Participants shall develop intelligent, refined, and digital governance applications and systems that support the entire workflow of automated problem detection, precise localization, intelligent work-order dispatch, closed-loop resolution, data statistics, and performance analysis, thereby helping urban governance transition from extensive management to refined, intelligent, and routine operations.

II. AI-Empowered Smart City Governance Track

Track Organizers: Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences; Otto Poon Charitable Foundation Smart Cities Research Institute, The Hong Kong Polytechnic University; China University of Geosciences (Wuhan); Shanghai JiGuang Polytechnic College

Track Overview: This track focuses on the integration of artificial intelligence with urban spatiotemporal big-data analytics. It addresses major urban-governance challenges such as traffic congestion, environmental pollution, structural imbalance, and insufficient resilience, with the objectives of intelligent anticipation, collaborative computing, and precise intervention. AI technologies are used to empower smart city development, operation, and maintenance. Participants are encouraged to conduct application-oriented research and development in scenarios such as urban operational situation awareness, public-safety supervision, and ecological and environmental protection, drawing on frontier technologies including space-air-ground sensing, urban foundation models, and spatiotemporal agents. The track values technological foresight and scalability and will place particular emphasis on multi-source spatiotemporal data fusion, the construction of large-model and intelligent-system architectures, and adaptability to application scenarios.

Challenge 1: Large Models for Urban Operational Situation Awareness and Early Warning

Using the capabilities of large language models and multimodal large models in spatiotemporal data understanding, multi-source information fusion, and logical reasoning, participants shall focus on potential risks across urban operations and perform situation identification and trend projection, hazard assessment, and risk early warning. The objective is to facilitate a shift in urban governance from "reactive response" to "proactive anticipation and precise prevention and control," thereby improving urban risk-control capabilities and emergency-response efficiency.

Challenge 2: Spatiotemporal Agents for Integrated Urban Governance

To address the needs and pain points of refined urban governance, participants shall integrate space-air-ground sensing networks, spatiotemporal big-data mining, digital twins, and artificial intelligence to build urban spatiotemporal agents capable of autonomous interaction, dynamic decision-making, and coordinated collaboration. The goal is to establish a new paradigm for urban governance and raise the level of intelligence, autonomy, and coordination in city management.

Challenge 3: Large-Model-Driven Intelligent Provision and Precise Response for Community Public Services

This challenge focuses on community-level public-service issues involving elderly care and childcare, healthcare, convenient public services, and residents' needs and requests. Participants shall use the capabilities of large language models and multimodal large models in community-scene understanding, intent recognition, resource matching, and intelligent interaction, while integrating community spatiotemporal sensing data with government-service data. Solutions should enable intelligent perception of residents' needs, precise allocation of service resources, and closed-loop handling of public-service requests. Potential topics include care for older adults living alone, assistance for vulnerable groups, intelligent planning of 15-minute convenient living circles, and intelligent triage of community service requests.

III. Remote Sensing and Digital Twins Track

Track Organizers: Photogrammetry and Remote Sensing Committee of the Chinese Society for Geodesy Photogrammetry and Cartography; Aerospace Information Research Institute, Chinese Academy of Sciences; Central South University; Yellow River Conservancy Technical University; Zhongke Satellite Technology Group Co., Ltd.

Track Overview: This track focuses on dynamic urban monitoring and smart city development through the deep integration of multispectral remote sensing, InSAR, spatiotemporal big data, and artificial intelligence. Target scenarios include urban expansion, land subsidence, urban health assessment, and digital twins. Participating teams are encouraged to use multi-source space-air-ground data—including long time-series remote-sensing imagery, time-series SAR data, street-view imagery, and IoT data—together with AI-assisted analytics and attribution models to accurately identify the spatiotemporal characteristics of urban change, quantitatively reveal driving factors and their coupling mechanisms, and explore end-to-end solutions spanning status perception, health diagnosis, digital reconstruction, and intelligent decision-making.

Challenge 1: Dynamic Remote-Sensing Monitoring and Driving-Factor Analysis of Urban Expansion

Using long time-series terrestrial remote-sensing imagery, participants shall quantitatively extract information on urban impervious surfaces, construct long-term urban-development datasets, and analyze spatiotemporal characteristics such as the speed, scale, and direction of built-up-area expansion. Participants shall identify multidimensional driving factors—including economic, social, policy, and natural factors—and use

methods such as correlation analysis, GeoDetector, and machine-learning attribution models to quantitatively assess the influence of individual factors on urban expansion and their coupled interactions.

Challenge 2: Monitoring Urban Land Subsidence and Analyzing Multidimensional Driving Factors

Using long time-series SAR satellite data such as Sentinel-1, together with multi-source auxiliary data including geological surveys, hydrological monitoring, and socioeconomic information, participants shall employ time-series InSAR techniques to accurately retrieve land-subsidence information. The integration of AI to improve deformation-recognition accuracy is encouraged. Solutions should quantitatively reveal the spatial distribution, intensity levels, clustering extent, and temporal evolution of subsidence and analyze the independent and interactive effects of natural and anthropogenic driving factors.

Challenge 3: "AI+" for Space-Air-Ground Collaborative Intelligent Urban Health Assessment and Applications

Focusing on urban-governance challenges addressed through urban health assessments, participants shall use multi-source space-air-ground data to support intelligent perception, diagnostic evaluation, and decision support for needs involving building safety, energy consumption, urban heat-island effects, public-space quality, and infrastructure operations. By deeply integrating AI with space-air-ground information, participants shall automate the extraction and intelligent analysis of multidimensional urban-health indicators and develop a complete technical solution covering multi-source data acquisition and alignment, feature extraction and intelligent analysis, and interpretable outputs.

Challenge 4: "AI+" for Intelligent Modeling and Scenario Reconstruction in Urban Digital Twins

Using multi-source space-air-ground data—including remote-sensing imagery, street-view imagery, LiDAR, IoT data, GIS attributes, and engineering standards—participants shall develop AI+ solutions for high-precision, updateable, and multi-scale intelligent modeling of urban entities and scenarios, together with dynamic scenario reconstruction. The complete technical pipeline should cover multi-source data acquisition and fusion, entity-feature extraction and semantic understanding, geometric and attribute modeling, dynamic scenario reconstruction, visual presentation, and integration with digital-twin applications.

IV. BIM + Smart City Digital Twin Applications Track

Track Organizers: Beijing University of Technology; Jiangsu University of Architectural Technology; Glodon Company Limited

Track Overview: Open to teams from vocational colleges, universities, and non-academic organizations, this track focuses on the integrated application of BIM with CIM, GIS, real-scene 3D, IoT, AI, and space-air-ground data. It targets smart city scenarios such as urban renewal, infrastructure operation and maintenance, resilience and safety, and green and low-carbon development. Participants are encouraged to produce deployable, demonstrable, and scalable digital-twin models, simulation analyses, and operational application solutions.

Challenge 1: Fine-Grained BIM Modeling and Operation and Maintenance Applications for Urban Infrastructure

Participants shall select objects such as urban roads, bridges, utility tunnels, schools, hospitals, or buildings in industrial and business parks; construct BIM models; link facility information; and provide lightweight visualization. The resulting applications should support smart operation and maintenance scenarios such as facility asset registries, inspection and maintenance, hazard records, and emergency response. Emphasis will be placed on engineering representation, model quality, and implementation of operational workflows.

Challenge 2: Urban Renewal and Spatial-Governance Decision-Making through BIM+CIM Multi-Source Data Integration

For scenarios including the renovation of aging residential communities, 15-minute living circles, transit-oriented development (TOD), historic-district conservation, underground-space development, and urban health assessment, participants shall integrate BIM models, CIM/GIS base platforms, remote-sensing imagery, real-scene 3D data, population and transport data, public-service data, and IoT sensing data. The objective is to build decision-support applications for planning evaluation, option comparison, and refined governance.

Challenge 3: BIM+AI+IoT Digital Twins for Urban Lifelines and Resilience Safety

For urban lifelines and key public facilities—including gas, water supply, drainage, bridges, tunnels, underground utility corridors, and fire protection—participants shall construct BIM-based digital-twin scenarios and connect or simulate multi-source data such as IoT sensing, UAV inspection, remote-sensing monitoring, and work-order events. The solution should support monitoring and early warning, risk assessment, coordinated emergency response, operation and maintenance actions, and post-event review and evaluation.

Challenge 4: CIM + Development and Solution Design for Typical Application Scenarios

This challenge emphasizes virtual-physical integrated application scenarios during the operation and maintenance stage. Participants shall explore the practical implementation of emerging technologies such as virtual reality, digital twins, and AIGC in smart cities, smart communities, smart parks, smart campuses, smart transportation, smart construction sites, smart property management, and smart homes, and shall develop actionable solutions.

V. Digital and Intelligent Empowerment for Urban Renewal Track

Track Organizers: Human Settlements Information Laboratory, Tsinghua University; School of Architecture and Urban Planning, Nanjing University; Zhejiang College of Construction

Track Overview: Against the backdrop of urban development increasingly centered on existing built-up areas, this track focuses on digital practices for urban renewal. Target scenarios include the regeneration of underutilized spaces, revitalization of historic districts and industrial heritage, and improvement of public-space quality. Participating teams are encouraged to integrate multi-source data such as remote-sensing imagery, street-view imagery, points of interest (POIs), pedestrian-flow heat maps, and real-scene 3D data, together with space-air-ground information technologies including AI-based recognition, GIS spatial analysis, and digital twins. Teams shall conduct spatial diagnosis, value assessment, and renewal planning and develop digital and intelligent urban-renewal solutions that are innovative, practical, and scalable.

Challenge 1: Regeneration of Underutilized Spaces—Spatial Identification and Scenario Planning for Revitalizing Urban Vitality

Focusing on vacant parcels, underutilized industrial sites, declining commercial districts, spaces beneath bridges, residual and leftover spaces, and public spaces in aging communities, participants shall comprehensively use multi-source spatial data and technologies such as AI-based recognition and GIS spatial analysis to support the identification of underutilized spaces, vitality diagnosis, value assessment, and renewal-scenario planning, thereby producing a complete regeneration proposal.

Challenge 2: Digital Renewal of Historic Districts and Industrial Heritage

Participants shall explore the integrated application of space-air-ground information technology and artificial intelligence in the conservation and renewal of historic districts, industrial heritage sites, and urban character

conservation areas. Solutions should integrate remote-sensing imagery, UAV oblique photography, street-view imagery, and real-scene 3D data with technologies such as GIS spatial analysis, AI-based recognition, AR/MR presentation, and digital twins to support digital identification, documentation, presentation, renewal, and adaptive reuse.

Challenge 3: Quality Improvement and Micro-Renewal Design for Urban Public Spaces

For street spaces, squares, parks and green spaces, waterfront areas, areas around campuses, community public spaces, and commercial districts, participants shall integrate multi-source spatial data with GIS spatial analysis, AI-based recognition, and spatial-quality assessment. The resulting micro-renewal proposal should cover problem identification, quality evaluation, spatial optimization, supplementation of facilities, introduction of activities, and an implementation pathway.

Challenge 4: Digital Renewal and Resilience Enhancement of Underground Spaces

Focusing on underground commercial streets, civil-defense facilities, underground passages, underground parking facilities, utility tunnels, and underground transport hubs, participants shall integrate ground-penetrating radar, 3D laser scanning, BIM, GIS, IoT, digital twins, and AI-based safety assessment. They shall assess structural safety, disaster-prevention capacity, environmental quality, and emergency-evacuation capacity, and propose coordinated aboveground-underground renewal strategies and sustainable operating models.

VI. Integration of the Low-Altitude Economy and Smart Cities Track

Track Organizers: Low-Altitude Development and Utilization Working Committee of the Chinese Society for Geodesy Photogrammetry and Cartography; National Key Laboratory of Surveying, Mapping and Remote Sensing Information Engineering; Hongyi Honor College, Wuhan University

Track Overview: Since its inclusion in the national transportation development plan in 2021, the low-altitude economy has been regarded as a strategic emerging pillar industry. However, its development has been slowed by the central challenge of collision risk. This issue is especially acute in cities, where demand for low-altitude applications is greatest but large-scale operations have yet to take off. This track focuses on the deep integration of the low-altitude economy with smart cities and on core technological breakthroughs and scenario-based applications that use surveying, mapping, and remote sensing to support the safe and efficient development of urban low-altitude operations.

Challenge 1: Urban Remote Sensing and Low-Altitude Flight Safety

To address flight-safety challenges arising from the large-scale development of the urban low-altitude economy, participants shall leverage space-air-ground technologies in surveying, mapping, remote sensing, and geographic information. Innovative, practical, and deployable technical solutions are encouraged from perspectives including airspace-environment modeling, dynamic risk perception, intelligent route planning, multi-source data fusion, and coordinated flight control. The objective is to establish a safe, efficient, and intelligent support system for large-scale low-altitude urban flight.

Challenge 2: Typical Smart City Application Scenarios for the Low-Altitude Economy

This challenge focuses on typical applications of the low-altitude economy in smart cities and explores how UAVs, electric vertical take-off and landing aircraft (eVTOLs), and other low-altitude vehicles can empower urban governance, public services, and industrial upgrading. Participants are encouraged to integrate space-air-ground information technology with artificial intelligence in areas such as urban logistics and delivery, infrastructure inspection, emergency response and rescue, smart culture and tourism, environmental monitoring,

and air traffic management. Solutions should be highly innovative, deployable, and scalable and should demonstrate the value of deeply integrating the low-altitude economy with smart cities.

VII. Intelligent GIS Applications Track

Track Organizers: Cartography and Geographic Information Systems Committee of the Chinese Society for Geodesy Photogrammetry and Cartography; Guangzhou University; Sun Yat-sen University; Beijing Polytechnic College

Track Overview: This track focuses on integrated innovation involving GIS, artificial intelligence, UAV aerial surveying, and real-scene 3D technologies in typical smart city scenarios such as disaster emergency response, urban governance, and spatial analysis. Participating teams are encouraged to draw on geographic information science and frontier technologies such as deep learning, multimodal large models, and intelligent 3D interpretation to conduct algorithm development, system construction, and comprehensive application practice. The goal is to create technically robust, practical, and deployable GIS innovation solutions that fully demonstrate the value of space-air-ground integrated geographic information technology in urban digital development.

Challenge 1: Fine-Grained Perception and Dynamic Assessment of Sudden Disasters Driven by "AI+" Multimodal Ubiquitous Data

Participants shall explore innovative applications of multimodal large models for sudden disasters. Using multimodal unstructured data such as text, images, and video, participants shall develop an intelligent assessment system capable of extracting and quantifying key disaster indicators and enabling rapid situation awareness.

Challenge 2: Intelligent Extraction and Analytical Applications of Urban Real-Scene 3D Feature Data

Using real-scene 3D oblique-photogrammetric models, participants shall explore artificial-intelligence methods and develop a prototype intelligent data-processing and analysis system with capabilities such as high-precision point-cloud semantic segmentation and registration. The core objective is to automatically and accurately identify urban features—including buildings, roads, vegetation, and streetlights—from 3D geographic scenes and use the resulting information to develop advanced smart city applications for urban planning, urban-appearance management, ecological operation and maintenance, spatial governance, and related scenarios.

Challenge 3: Integrated GIS Object Detection and Spatial Analysis Based on UAV Orthophotos

For application scenarios integrating UAV aerial surveying, GIS, and deep learning, participants shall establish a technical pipeline for intelligent ground-object recognition, GIS spatial analysis, and application of results using high-resolution digital orthophoto map (DOM) data. Teams shall use UAV imagery, position and orientation system (POS) data, and ground-control-point data—either from public datasets or self-collected sources—to refine the DOM. Deep-learning techniques shall then be used for precise ground-object recognition, while GIS spatial-analysis algorithms shall support quantitative indicator calculation and thematic mapping, leading to a complete deployable application solution.

VIII. Integration of Data Elements and Smart City Applications Track

Track Organizers: Zengcheng District Data Element Industry Association; Urban and Rural Planning Institute (Guangzhou) Co., Ltd.

Track Overview: As a new factor of production, data elements are a core engine for citywide intelligent decision-making. However, data silos and insufficient value extraction remain major constraints on cities' transition toward precise and intelligent governance. This track focuses on the deep integration of data elements with smart cities, promotes a shift from experience-based decision-making to data-driven intelligence in

transportation, industry, public safety, and other scenarios, and encourages emerging models such as data-asset operations and city-level digital-twin decision-making. Participants are encouraged to conduct key technological research and application innovation in data-element governance and scenario-based value-added services.

Challenge 1: Intelligent Annotation and Scenario-Based Applications of Multimodal Urban Data

Focusing on dynamic urban monitoring and smart-transportation data, participants shall develop replicable and scalable intelligent-annotation solutions for multimodal urban data and scenario-based applications, thereby supporting smart city development and the growth of the data-element industry.

Challenge 2: Big-Data Integration and Value-Realization Innovation for Ecological Resources

Focusing on ecological-resource data in areas such as culture and tourism, sports, forestry, and ecological agriculture, participants shall develop replicable and scalable innovative solutions for integrating ecological-resource big data and realizing its value. The objective is to support intelligent ecological-resource management, advance the implementation of the “Two Mountains” principle—that lucid waters and lush mountains are invaluable assets—and promote green and low-carbon development and high-quality growth of the ecological economy.