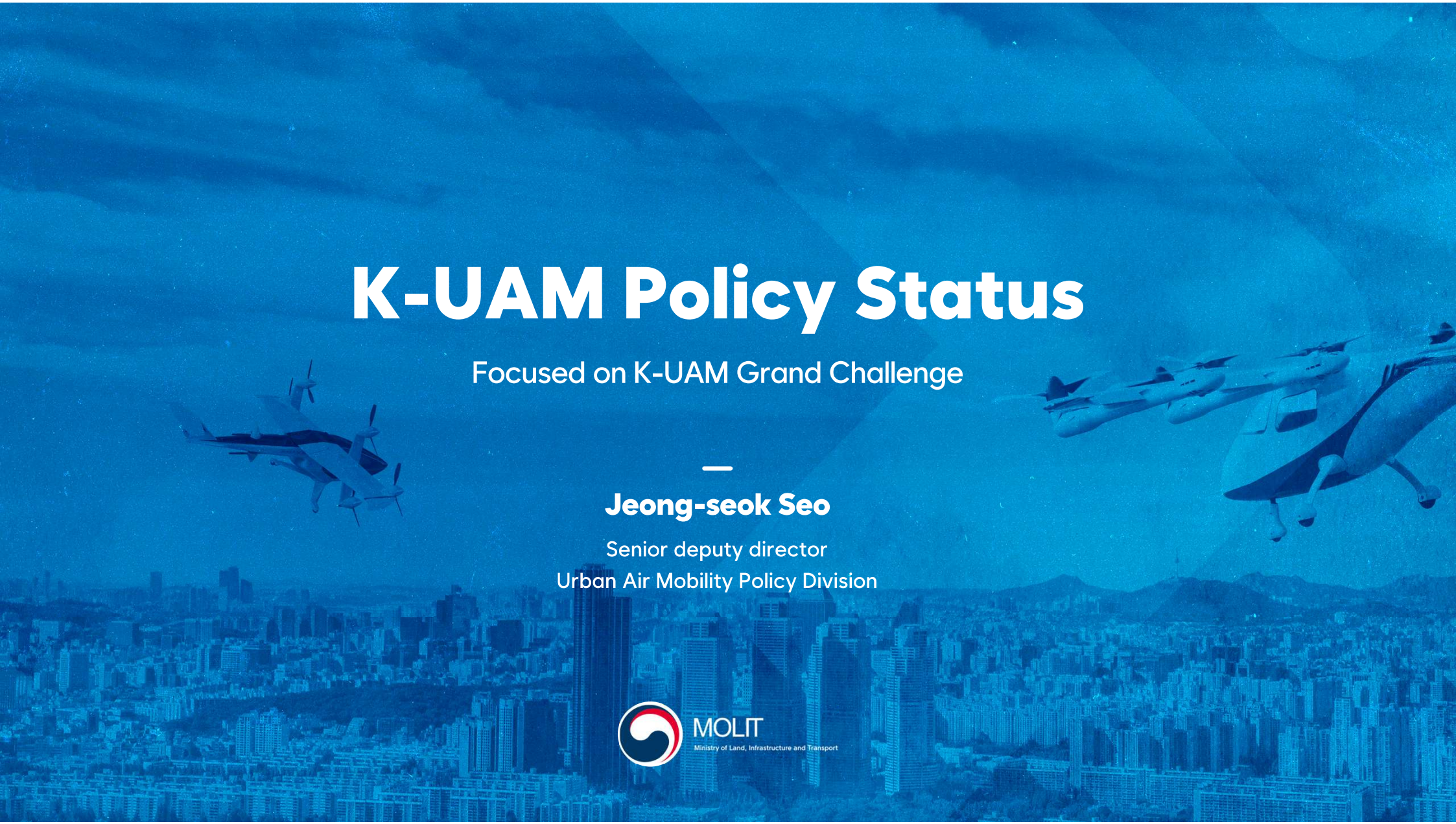


K-UAM Policy Status

Focused on K-UAM Grand Challenge

Jeong-seok Seo

Senior deputy director

Urban Air Mobility Policy Division

MOLIT

Ministry of Land, Infrastructure and Transport

Contents

I.

K-UAM Overview

K-UAM Overview

+ 01 K-UAM establishing and implementing the foundation as a national task

+ 02 Policy design and implementation focus

MOLIT
Ministry of Land, Infrastructure and Transport

Ministry of Trade, Industry and Energy

Ministry of Economy and Finance

Ministry of Science and ICT

Ministry of National Defense Republic of Korea

Safety is as the top priority, sustainability, acceptability, and public convenience as the main values.

K-UAM Overview

UAM Team Korea
Open the Urban Sky

2020.6
K-UAM Roadmap (Joint gov't roadmap)

2020.6
UAM Team Korea launched (public-private consultative body)

2021.3
K-UAM technology roadmap (Joint gov't roadmap)

2021.9
K-UAM ConOps 1.0

2022.12
K-UAM Grand Challenge plan announcement

2023.8
K-UAM Grand Challenge launch

2023.10
Enacting Urban Air Mobility Act

Overview Chart

Promotion Strategy

To realize ConOps, policies are being promoted with 'Demonstration (First)'and 'Regulation (later)' as the two main axes.

K-UAM Cornerstones

K-UAM Roadmap '20. 6

Policy Strategies for '25
Commercialization

K-UAM Technology Roadmap '21.3

Technologies required enabling feasible
UAM Ecosystem

K-UAM ConOps 1.0 '21.9

Basis for UAM service
: preparation for commercialization and enactment

Stage

- '20~'24 **Preparation**
  - Promotion of demonstration Projects
  - Regulations improvement
  - R&D Promotion
- '25~'29 **Beginning**
  - Commercialization
  - Promotion of pilot projects
  - Spread of nationwide services
- '30~'35 **Growth**
  - Expansion of flight routes
  - R&D Advancement
  - Business surplus conversion
- '35 **Maturity**
  - Commercialization
  - Realization of Autonomous Flights

Technology	Cruising Speed	Autonomous Flight	Traffic Managemnet	Route Design
Beginning 2025~	**150km/h**	On Board	Automation Introduction	Fixed Corridor
Growth 2030~	**240km/h**	Off Board	Automalion Advancement & Human Surveillance	Fixed Corridor network
Maturity 2035~	**300km/h**	Auto nomous	Complete Automation	Dynamic Corridor network

Roles and Responsibilities

Operation Structure

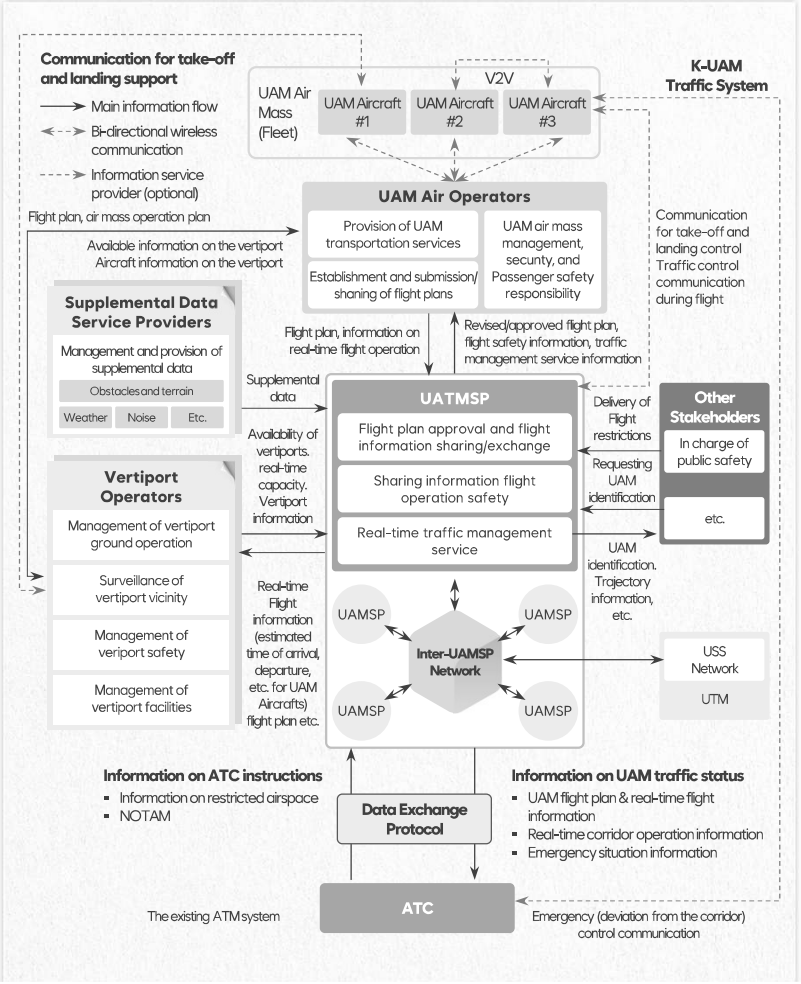
Operation Scenario

Demonstration
(K-UAM Grand Challenge)

K-UAM Overview

※ Note : Introducing K-UAM ConOps

Category	Beginning 2025~ >	Growth 2030~ >	Maturity 2035~ >
+ Pilot Operation	On Board	Autonomous Introduction	Autonomous Introduction
+ Traffic management system	UAM Traffic Management Service provider role step by step Expansion, Air Traffic controller participation step by step reduction		
+ Traffic Management Automation Level	Introduction of automation	Automation driven and Human surveillance	Full Automation Leads
+ Corridor Operation Method	(Fixed Corridor)	(Fixed Corridor Network)	(Dynamic Corridor Network)
+ Air Communication Network	Commercial mobile communication(4G·5G), Aviation voice communication	Commercial mobile communication (5G/6G), Low orbit satellite communication, C2 LINK, etc	
+ Navigation System	Precision satellite navigation	Precision satellite navigation + Image based relative navigation	Compound relative navigation
+ Vertiport Location and form	Centered around the metropolitan	Focused on metropolitan and metropolitan area	Nationwide expansion



II.

Policy Implementation Status

Policy Implementation Status

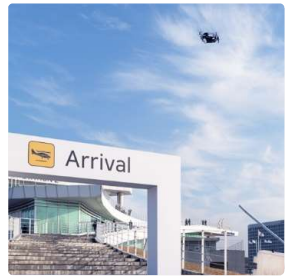
Overall Introduction

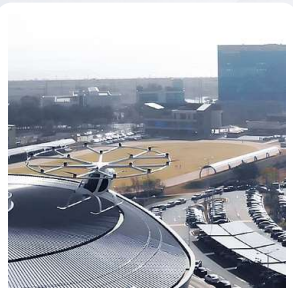
With 'Demonstration' and 'Regulation' as the two axes, 'R&D', 'pilot projects', and 'ecosystem creation' are also being promoted.

Flight Demonstration Event (Annual)

An annual "flight demonstration" event is also held to secure social acceptance and maintain the policy momentum ('20~).

K-UAM ◆ ◆ ◆ Flight Demonstration





Policy Implementation Status

Regulation : UAM Act

Current aviation laws and regulations are complex and strict.

Bold regulatory exemptions are needed for rapid and seamless demonstration.

- October 2023, UAM Act enacted.
- April 2024, Law in force
- Currently, various detailed regulations are being prepared.

Comparison of Current Aviation Law vs UAM Law

	Conventional aviation	e.g.) Inadequate for UAM	UAM act Contents
Safety	▪ Aviation Safety Act (Based on Existing aircraft safety standards)	▪ Based on Internal combustion engine ▪ Foreign aircraft(eVTOL) registration restriction	▪ Electric/battery centric safety regulation ▪ Open for foreign eVTOL / executives' registration
Business	▪ Aviation Business Act (Focus on Air Carrier)	▪ Foreigners are not eligible to be executive ▪ Not include new business part(e.G. Psu, vpo)	▪ Include PSU/VPO business part and set up suitable requirements for each part
Security	▪ Aviation Security Act (security of aircraft and airports)	▪ Requires robust security	▪ Simplified security standards and procedures
Infra-structure	▪ Airport Facilities Act (Government-led construction/operation)	▪ Large scale(budget, space) rural base airport requirement	▪ Private development considering V/P scale & Location

Policy Implementation Status

Regulation : UAM Act

Contents

Define Concept & components

UAM aircraft(eVTOL), business player, vertiport, corridors, etc..

Regulatory exemption

Establishing exemption system considering 'development & demonstration first-regulation later'

- Demonstration/Pilot Project Zone
  designate 3-dimensional spaces where regulatory exemptions are granted.
- Regulatory Exemptions
  only the minimum regulations(Safety, Security, Business, Facility) are be applicated.

Vertiport development

Establish promoter private or gov't(molit), and provides customized procedures.

Support creating ecosystem

Legally required master planning, annual survey of industrial status, administrative and financial support, etc..

Policy Implementation Status

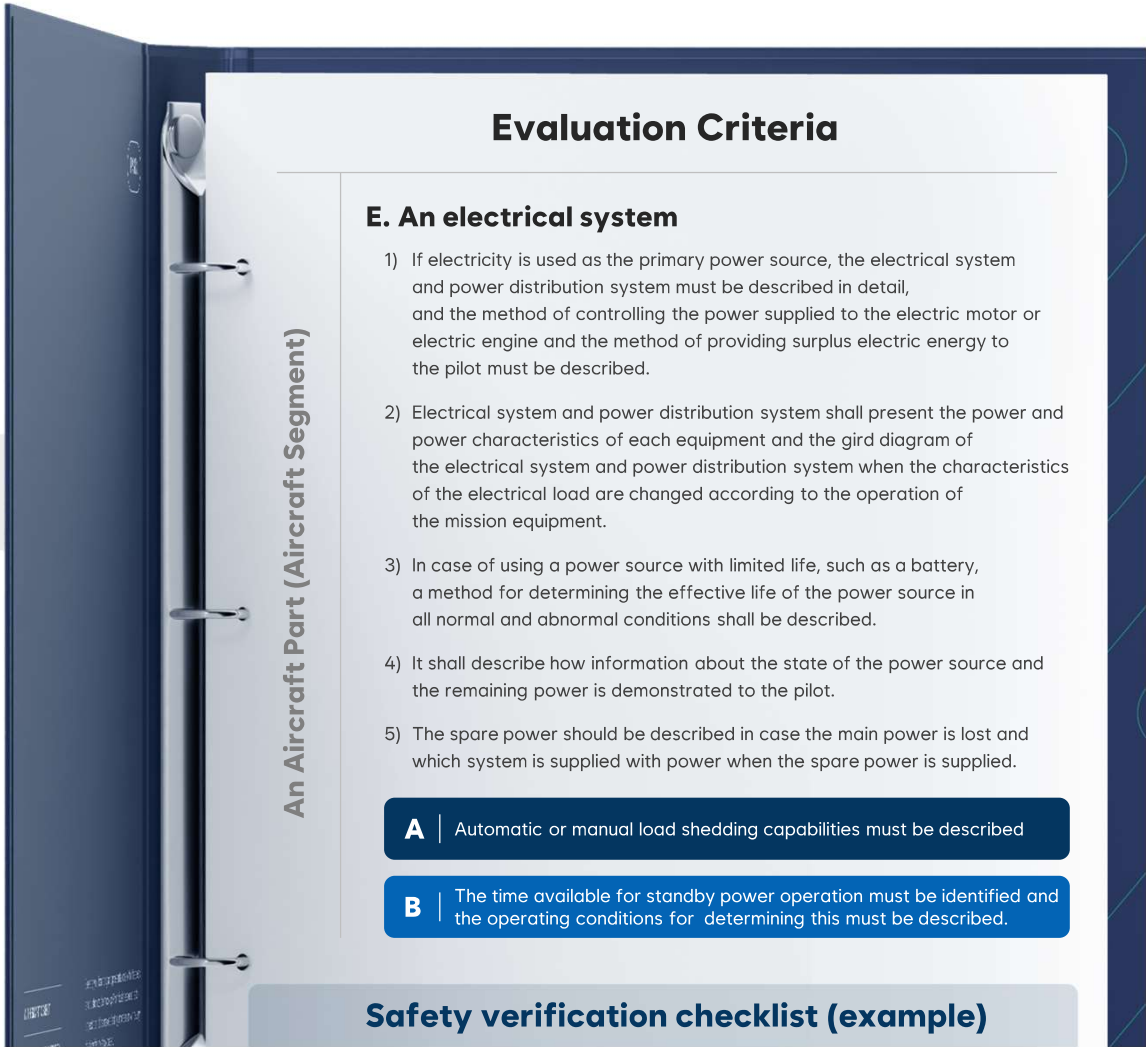
Regulatory exception guidelines

Create customized for Demonstration plans
for UAM features.

Example

- Guidelines for special airworthiness certificates for demonstration.

Essential to demonstrate urban areas, flight of densely populated areas in inevitable, but strictly restricted under the current system – a separate system contain a safety verification checklist (aircraft, pilot, operation, s/w, etc.) tailored to urban operation should be established.



Policy Implementation Status

R&D Overview

Various R&Ds are promoted through national financial investment, focusing on securing joint technical capabilities between public and private sectors.

Short Term R&D

Leveraging commercial base and conducting R&D in conjunction with GC with a goal of completion by 2025.
(Approx. 60 million USD)

Development of Virtual Integrated Operation platform program for UAM

Period 2022 ~ 2025

Purpose To support initial commercialization of UAM (`25~), Establishment of a verification platform such as pre-operational capabilities and procedures

Contents Develop and validate UAM virtual integrated operation platform that realized virtual flight environment

Development of Surveillance Information Acquisition System for UAM

Period 2022 ~ 2025

Purpose To support initial commercialization of UAM (`25~), acquiring surveillance information and developing reliability verification technology

Contents Develop and validate flight surveillance information acquisition & sharing systems for UAM path deviation monitoring

Autonomous Personal eVTOL R&D

Period 2019 ~ 2023

Budget Approx. 16 million USD

Purpose Secure safe operation technology linked to the development of future-type personal aircraft stock
Distributed Electric Propulsion, 650kg (1person),
The maximum speed 240km/h

Contents Development of aircraft flight control and safety enhancement technology, eVTOL and design safety verification technology.

Policy Implementation Status

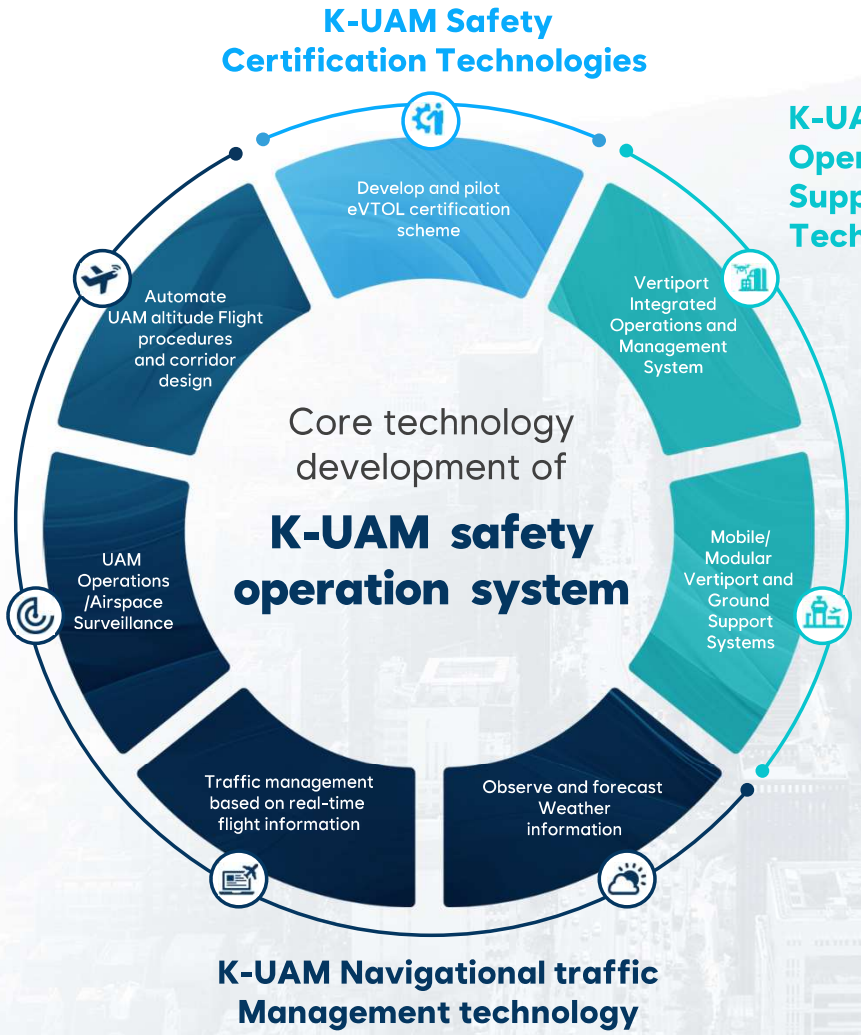
Mid-term R&D

Market expansion phase goal: R&D being carried out to secure core technological capabilities

(Approx. 75.2 million USD)

Development of Core Technologies for K-UAM Safety Operation System

Period	2024 ~ 2026
Budget	Approx. 75.2 million USD
Purpose	After growth period('30~), Acquiring core technologies of the UAM traffic management and certification system to secure the safety operating system
Contents	Development design technology of UATM system based on real-time flight information / Vertiport integrated operation and Automated take-off & landing guidance system / Development of safety and reliability verification technology for a new concept aircraft certification system



Policy Implementation Status

Pilot Project

Targets to diversify UAM operation models and create initial market demand.

- Support for various projects to spread UAM in various regions

  Collaboration with relevant central gov't and local gov't.

Air Tour

Revitalizing the Tourism Industry and Forming the Location and Scale of Bertie Port Based on Tourism Demand.

Public(Medical)

Review of the location considering the effect of improving public benefits and public purposes such as emergency medical care.

Air tour & Transport Compound

Review of support for demand for urban air transportation and ways to link it with existing means of transportation, etc.

In particular, public models such as firefighting, medical care, and security are pursuing financial Investment in initial operation

(Ministry of Land, Infrastructure (MOLIT), and Transport – National Police Agency, Fire Agency, etc.)

Policy Implementation Status

Ecosystem creation

UAM Team Korea (UTK) | Operation of UAM Team Korea, a public-private consultative body involving central gov't, local gov't, private company, academia, research institutes('20.6~)

Support for various projects to spread UAM in various regions
(Ministry of Land, Infrastructure and Transport (Central Gov't)
– Collaboration with local gov't

Total of 170 organizations participated in the design and institutional preparation of UAM policies.

Decision-making bodies such as the council(major decision making), working council (professional and technical decision making).

UAM Team Korea
Open the Urban Sky

HOST Ministry of Land, Infrastructure and Transport

Secretariat KARI 한국항공우주연구원 KIAST Korea Institute of Aviation Safety Technology

Key Participating 57

General Participating 107

Industry

16

SK telecom, Hanwha, Korean Air, Hyundai Engineering & Construction, Hyundai Motor, kakaomobility, KAI, kt, Lotte Innovate, Lotte rental, LIG Nex1, Doosan, GS E&C, LG U+, Verty, UAMitra

73

POSCO E&C	LOTTE E&C
Shinsegae Property	TMAP Mobility
Skyports	KENCOA Aerospace
Mobius Energy	Vertical Aerospace
ANRA Technologies	Gansam Co.,Ltd
T'way Air	Wegoes
Jejuair	LG CNS
Boeing KOREA	Voltline
ROVIGOS	• • •

Academia

7

Seoul National University, KAIST Korea Advanced Institute of Science and Technology, Konkuk University, Inha University, Hanseo University, Korea Aerospace University, Far East University

9

- Kyungpook National University
- Kongju National University
- Chungnam National University
- Republic Of Korea Air Force Academy
- Kookmin University
- Cheongju University
- Korea National University of Transportation
- Keimyung University
- Korea University

Government Ministry

6

Ministry of National Defense Republic of Korea
Ministy of Economy and Finance
Ministy of Science and ICT
Ministy of Trade, Industry and Energy
Korea Meteo rological Administration
Ministy of SMEs and Startups

2

- Korea National Police Agency
- Ministry of Oceans and Fisheries

Local Government

17

Seoul Metropolitan Government, Incheon Metropolitan City, Gyeonggi-do, Busan Metropolitan City, Gwangju City, Daejeon Metropolitan City, Daegu, Jeju Special Self-Governing Province, Gyeongsangnam-do, Ulsan Metropolitan City, Chungbuk, Sejong City, Gangwon State, Gyeongsangbuk-do Gyeongnam, Chungnam, JeollaNamdo, Jeonbuk State

1

- Goyang special city

Related Organization Research Institution

11

KAC Korea Airports Corporation, TS 한국교통안전공단, Incheon Airport, LX Korea Land and Geospatial Informatix Corporation, LH Korea Land & Housing Corporation, KOTI 한국교통연구원 The Korea Transport Institute, ETRI, KICT Korea Institute of Civil Engineering & Building Tech., KAIA, ex Korea Expressway Corporation, kepco

22

- Korea Meteorological Institute
- Institute for Aerospace Industry-Academia Collaboration
- Ulsan Technopark
- Korea Testing Laboratory
- Korea Research Institute of Ships & Ocean Engineering
- Korea Electronics Tehnology Institute
- Telecommunications Technology Association
- Korea Air Traffic Controllers' Assocation
- • •

Policy Implementation Status

Specialized division system

05 Divisions 14 Working Groups

UAM law Supporting Group

- : Division
- Text : Working Group
- : Relevant Department
- Text : Leading organization
- : Participating organizations

UAM Team Korea

UAM Policy Division

Regulation | Security | R&D

MOLIT, MOTIE

Regulation | Security

UTK Secretariat

KARI | KIAST

eVTOL/operating division			Infrastructure Division			Traffic Management Division			Add' Services Division	
Qualification	Certification	Operating System	Vertiport development	Vertiport Construction	Business Model	Communi-cation	Navigation & Surveillance	Airspace & Information	Spatial information	Weather information
2 Divisions (MOLIT)	3 Divisions (MOLIT)	2 Divisions (MOLIT)	4 Divisions (MOLIT)	3 Divisions (MOLIT)	1 Division (MOLIT)	4 Divisions (MOLIT, MSIT)	2 Divisions (MOLIT)	3 Divisions (MOLIT, MND)	2 Divisions (MOLIT)	2 Divisions (MOLIT,KMA)
TS	KIAST	IIAC	LH	KARI	KOTI	KARI	KIAST	KAC	LX	KMITI
16 organizations	25 organizations	21 organizations	52 organizations	53 organizations	30 organizations	17 organizations	20 organizations	30 organaizations	20 organizations	17 organizations

III.

K-UAM Grand Challenge

K-UAM Grand Challenge (GC)

Background

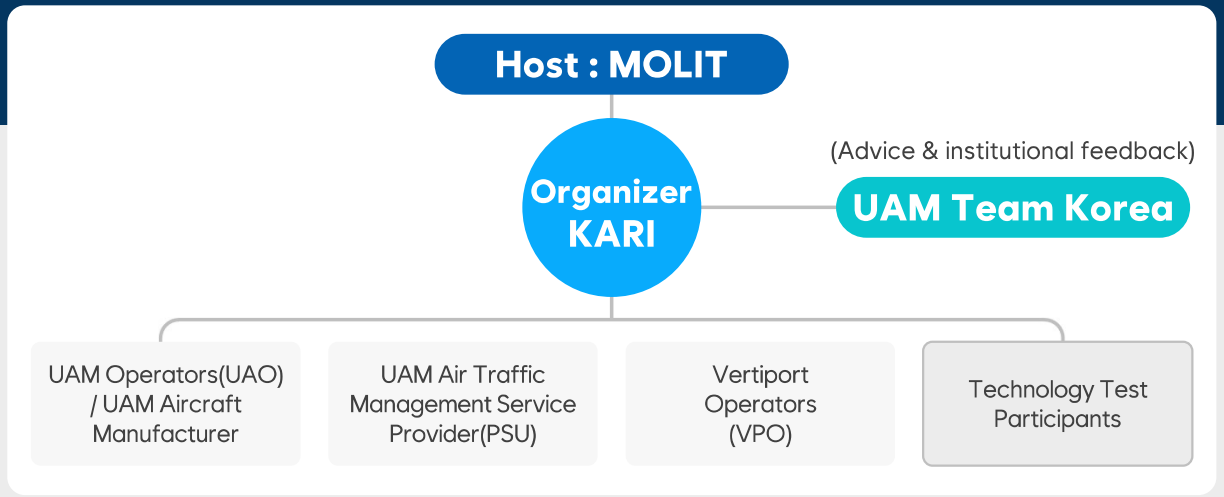
UAM is different from existing aviation systems such as airframe, traffic management, and infrastructure, so demonstration is essential for establishing new operational concepts and safety standards.

Expected Effect

- **Companies/Institutions** support for private technology development
- **Gov't** making proper regulations based on demonstration results(e.g. corridor width)
- **Public** securing social acceptance through safety demonstration, etc.

Organization System

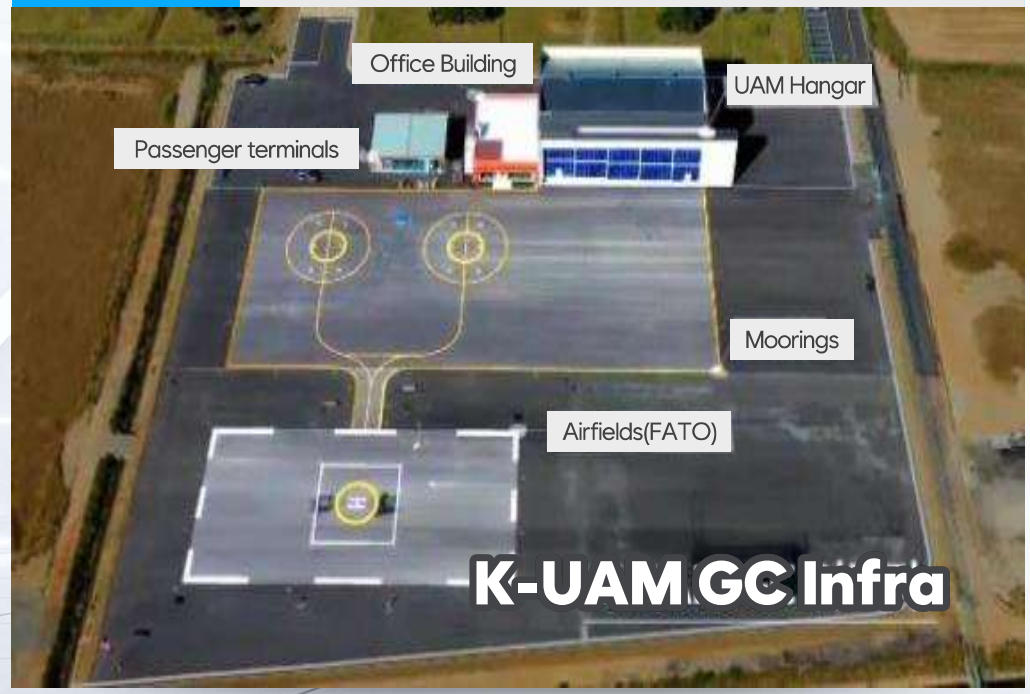
- Ministry of Land, Infrastructure and Transport (Host) – Entrusted Korea Aerospace Research Institute.
- Companies wishing to participate are being recruited and implemented after finalizing the agreement and plan (organizer).



K-UAM Grand Challenge (GC)

Phase 1

Rural Area, Goheung, Jeollanam-do, '23.8 ~ '24



Phase 2

Urban Area, '24 ~

K-UAM Grand Challenge (GC)

Participating companies

Korean companies + Global eVTOL manufacturer

K-UAM One Team

KOREAN AIR
Incheon Airport EXPECT EXCEPTIONAL
HYUNDAI MOTOR GROUP kt
HYUNDAI ENGINEERING & CONSTRUCTION

UAMitra

도심항공모빌리티 산업기술연구조합 UAMitra
Verty

K-UAM Dream team

SK telecom
Hanwha Systems
KAC 한국공항공사

K-UAM Future Team

kakaomobility
LG U+
GS건설

KAL Hyundai : OPPAV(KARI)


K-UAM Dream Team : S4(JOBY)


UAM Future Team : Midnight(Archer Aviation)


UAMitra : Properity (Autoflight)

K-UAM Grand Challenge (GC)

Demonstration infrastructure deployment status

Phase 1

Establishment of Demonstration Infrastructure in Goheung, Jeollanam-do

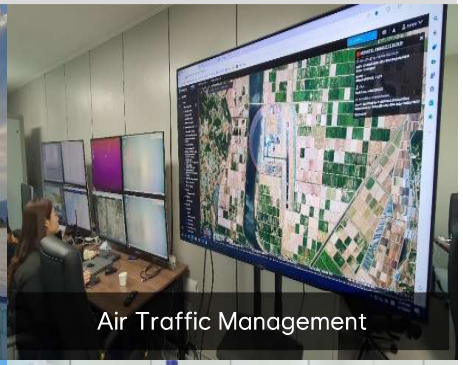
Phase 2

Vertiport in construction process in the urban region Demonstration area

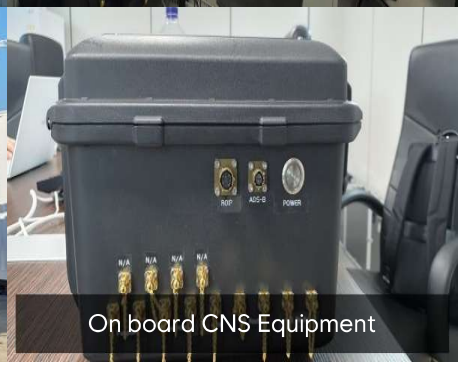
Infrastructure

(Ops system) Traffic Management


Surveillance Radar /Ground Network

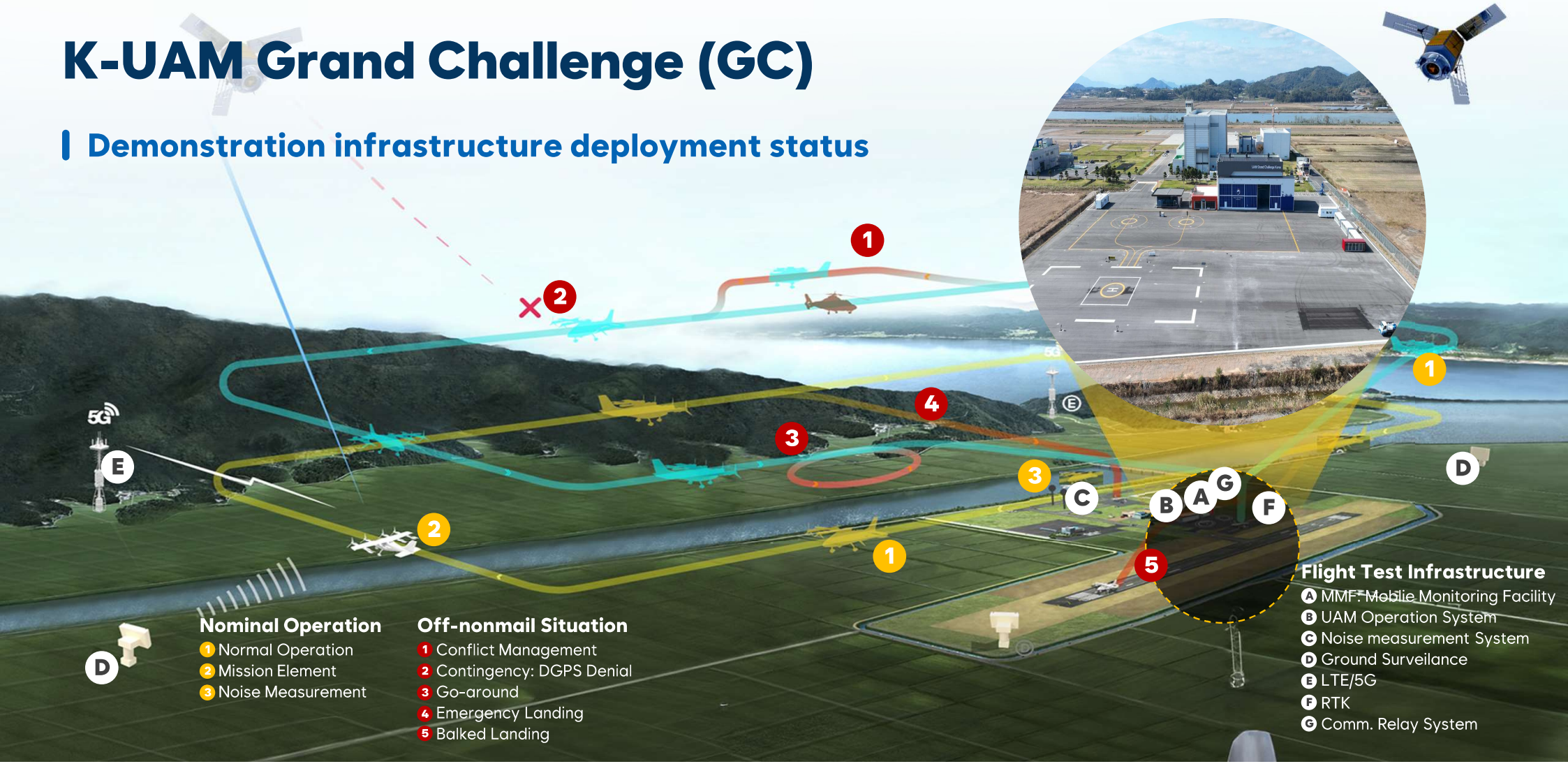

Air Traffic Management

System Monitor Vehicle


On board CNS Equipment

K-UAM Grand Challenge (GC)

Demonstration infrastructure deployment status



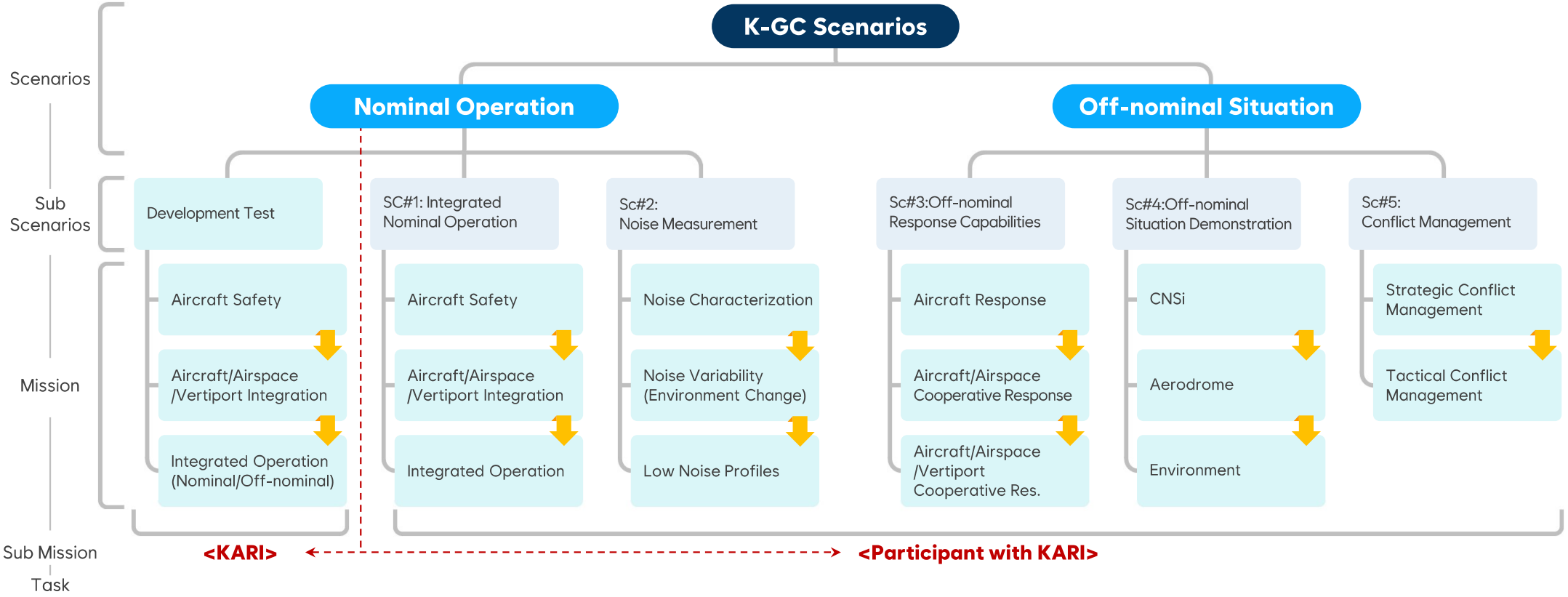
Nominal Operation
1. Normal Operation
2. Mission Element
3. Noise Measurement

Off-nonmail Situation
1. Conflict Management
2. Contingency: DGPS Denial
3. Go-around
4. Emergency Landing
5. Balked Landing

Flight Test Infrastructure
- A MMF: Mobile Monitoring Facility
- B UAM Operation System
- C Noise measurement System
- D Ground Surveilance
- E LTE/5G
- F RTK
- G Comm. Relay System

K-UAM Grand Challenge (GC)

Structural Diagram of GC Scenarios



K-UAM Grand Challenge

Linking Grand Challenges to institutionalization

Use data from empirical results to determine Specific regulatory requirements

GC-institutionalization linkage (example)

Regulations	GC association
Vertiport Design Criteria	Size of entry and exit restricted surfaces, adequate width of safe zones
Corridor Design Criteria	Corridor width design criteria
UAM Information System Operational Standards	Traffic Management Program Requirements
UAM Noise	Noise measurement methods, urban center entry criteria and rating zones
Flight safety and flight rules	Aircraft separation, emergency response time
Navigational Safety Equipment Standards	Navigation position accuracy, communication latency-transmission rate, etc.

ICAO

SKYTALKS

Thank You.

UAM Team Korea
Open the Urban Sky