

SKYTALKS

AAM 2024

ICAO's FIRST ADVANCED AIR MOBILITY
SYMPOSIUM

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ICAO Headquarters, Montreal, Canada



K-UAM Policy Status

Focused on K-UAM Grand Challenge

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MOLIT
Ministry of Land, Infrastructure and Transport

AAM 2024

ICAO's FIRST ADVANCED AIR MOBILITY SYMPOSIUM

Contents

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- II. Policy Implementation Status
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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



- **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



Period

- '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 Management	Route Design
Beginning 2025~	150km/h	On Board	Automation Introduction	Fixed Corridor
Growth 2030~	240km/h	Off Board	Automation Advancement & Human Surveillance	Fixed Corridor network
Maturity 2035~	300km/h	Autonomous	Complete Automation	Dynamic Corridor network

Roles and Responsibilities

Operation Structure

Operation Scenario

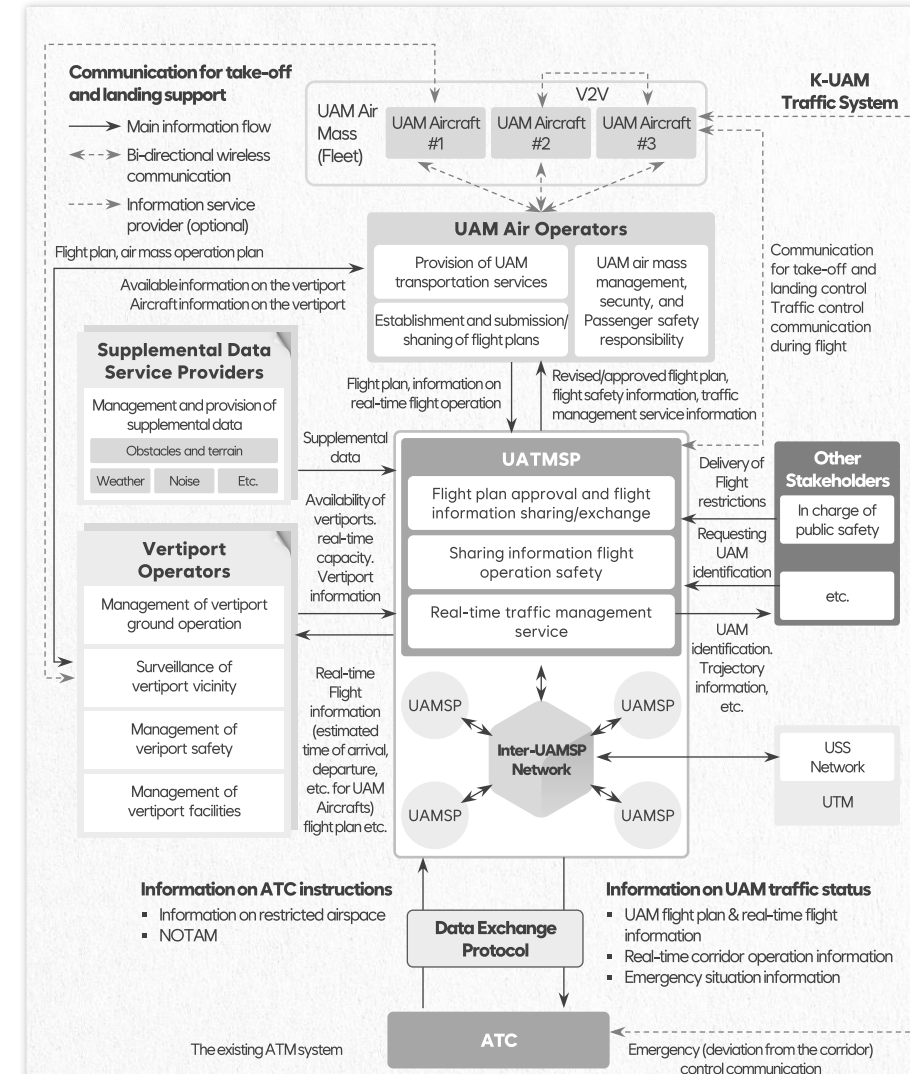


Demonstration
(K-UAM Grand Challenge)

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

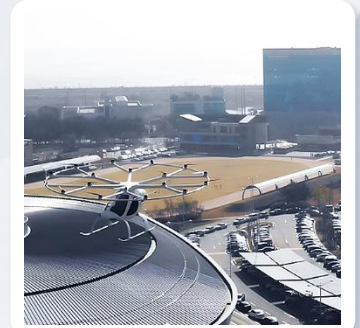
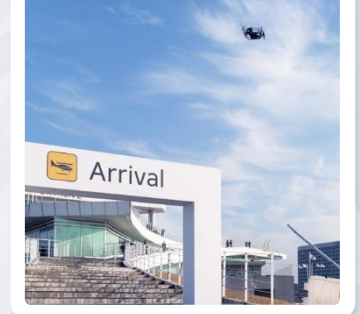
Overall Introduction

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	<ul style="list-style-type: none"> ▪ Aviation Safety Act (Based on Existing aircraft safety standards) 	<ul style="list-style-type: none"> ▪ Based on Internal combustion engine ▪ Foreign aircraft(eVTOL) registration restriction 	<ul style="list-style-type: none"> ▪ Electric/battery centric safety regulation ▪ Open for foreign eVTOL / executives' registration
Business	<ul style="list-style-type: none"> ▪ Aviation Business Act (Focus on Air Carrier) 	<ul style="list-style-type: none"> ▪ Foreigners are not eligible to be executive ▪ Not include new business part(e.G. Psu, vpo) 	<ul style="list-style-type: none"> ▪ Include PSU/VPO business part and set up suitable requirements for each part
Security	<ul style="list-style-type: none"> ▪ Aviation Security Act (security of aircraft and airports) 	<ul style="list-style-type: none"> ▪ Requires robust security 	<ul style="list-style-type: none"> ▪ Simplified security standards and procedures
Infra-structure	<ul style="list-style-type: none"> ▪ Airport Facilities Act (Government-led construction/operation) 	<ul style="list-style-type: none"> ▪ Large scale(budget, space) rural base airport requirement 	<ul style="list-style-type: none"> ▪ 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 applied.

■ 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

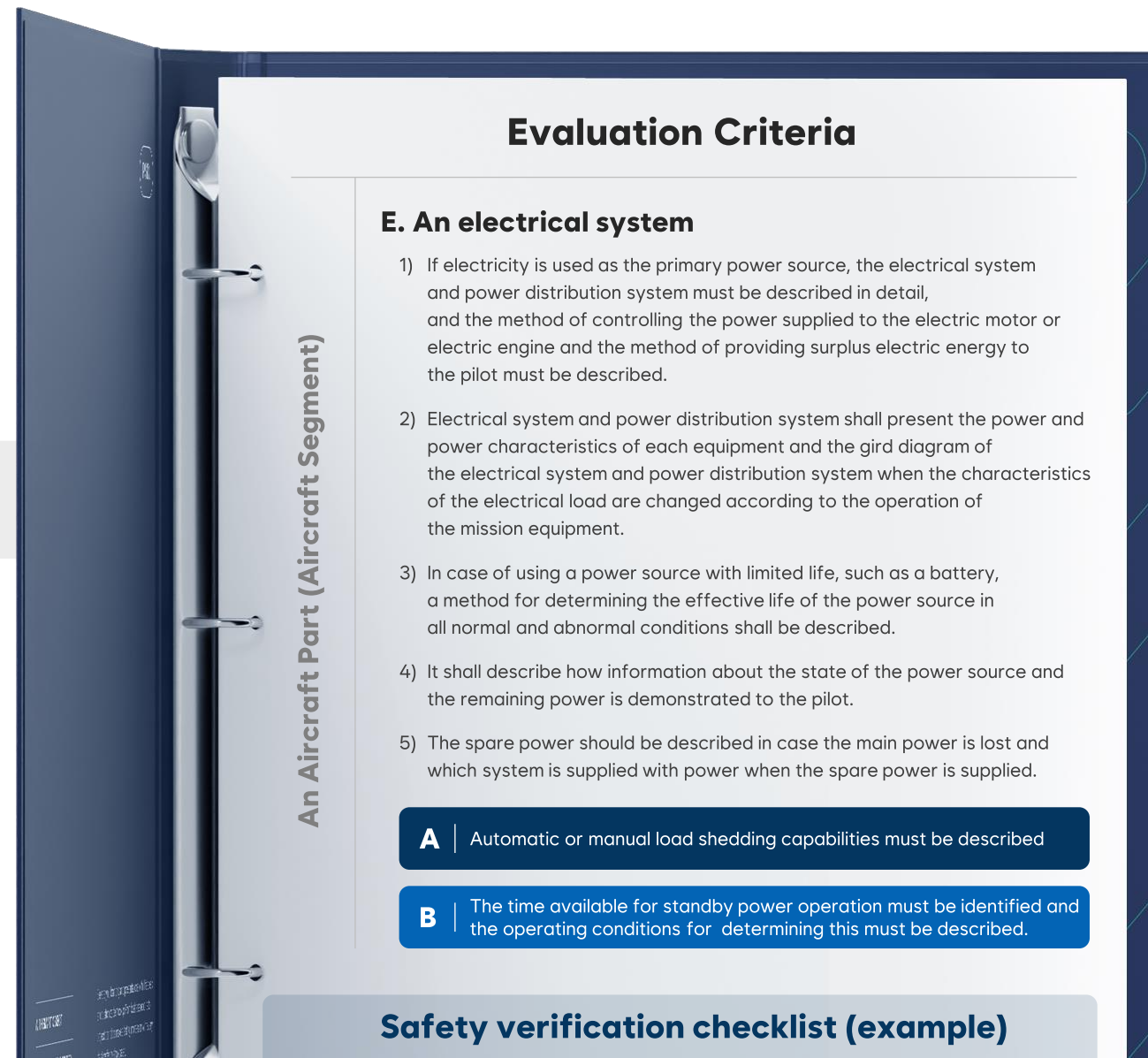
Regulatory exception guidelines

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 is 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.



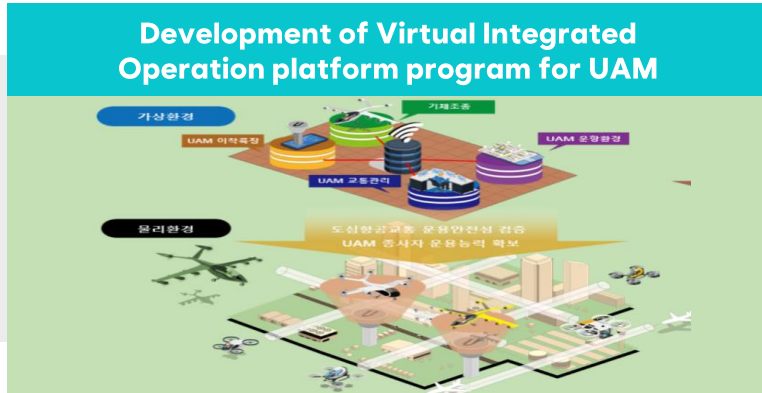
Policy Implementation Status

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)



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



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



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

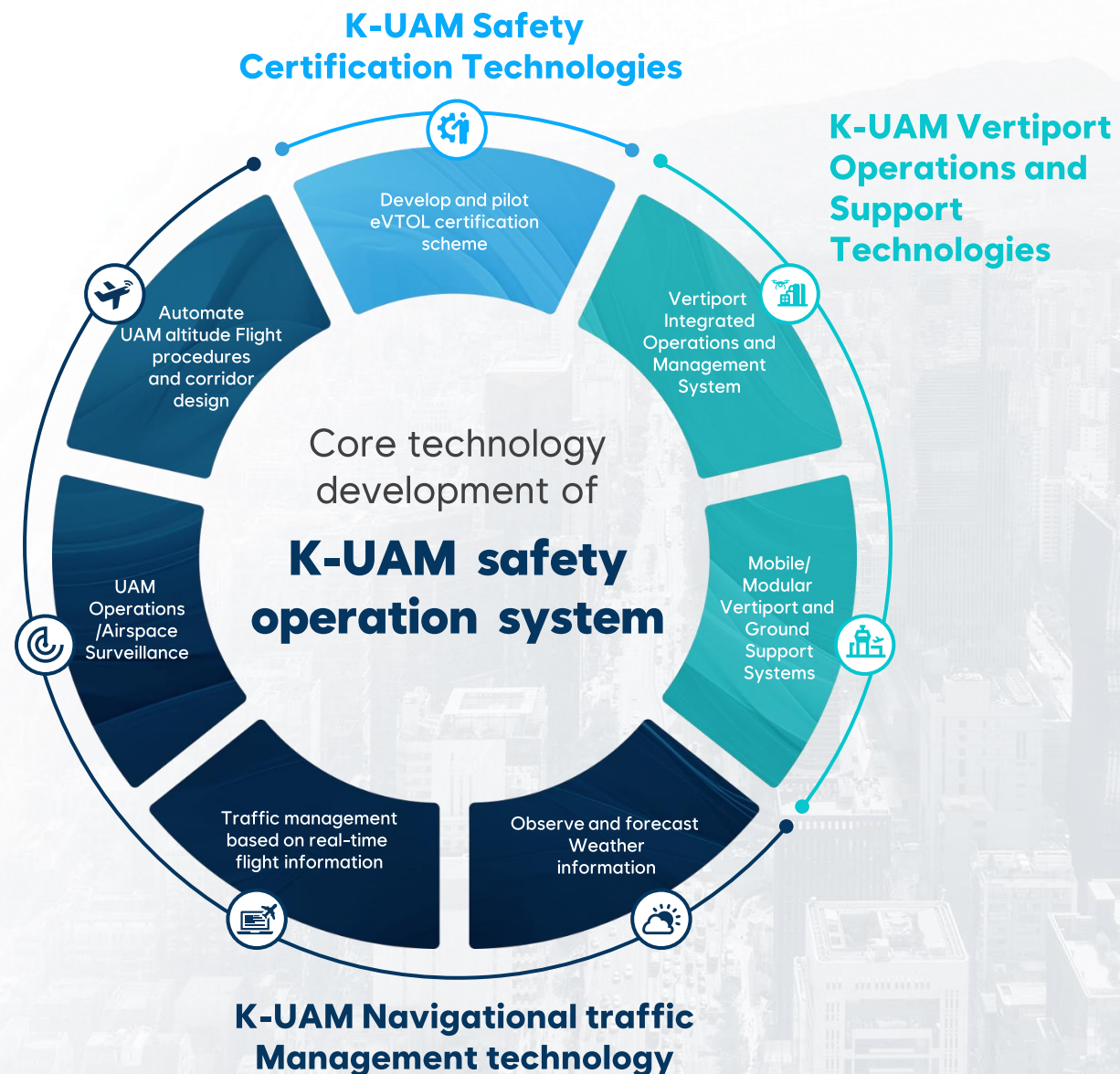
Mid-term R&D

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).



Key Participating
57

General Participating
107

Industry

16

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	...

73

Academia

7

Kyungpook National University

9

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

Korea National Police Agency

Ministry of Oceans and Fisheries

Local Government

17

Goyang special city

Related Organization Research Institution

11

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' Association

...

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



eVTOL/operating division		
Qualification	Certification	Operating System
2 Divisions (MOLIT)	3 Divisions (MOLIT)	2 Divisions (MOLIT)
TS	KIAST	IIAC
16 organizations	25 organizations	21 organizations

Infrastructure Division		
Vertiport development	Vertiport Construction	Business Model
4 Divisions (MOLIT)	3 Divisions (MOLIT)	1 Division (MOLIT)
LH	KARI	KOTI
52 organizations	53 organizations	30 organizations

Traffic Management Division		
Communication	Navigation & Surveillance	Airspace & Information
4 Divisions (MOLIT, MSIT)	2 Divisions (MOLIT)	3 Divisions (MOLIT, MND)
KARI	KIAST	KAC
17 organizations	20 organizations	30 organizations

Add' Services Division	
Spatial information	Weather information
2 Divisions (MOLIT)	2 Divisions (MOLIT, KMA)
LX	KMITI
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.

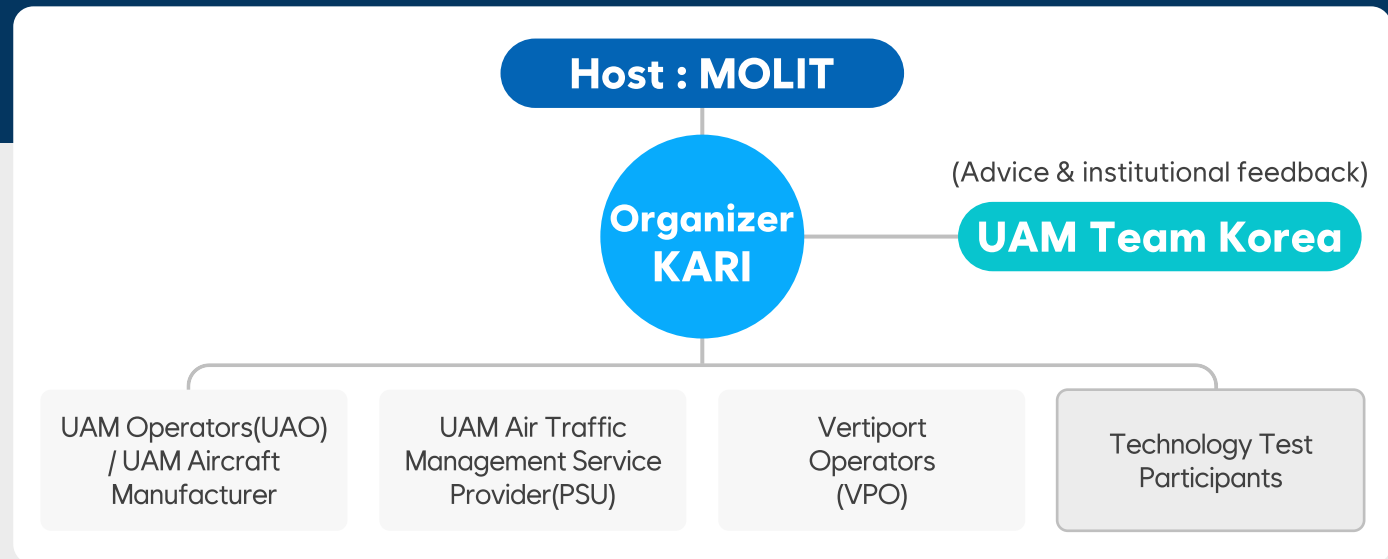
Expected Effect

- ▶ **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

Office Building
UAM Hangar
Passenger terminals
Moorings
Airfields(FATO)

K-UAM GC Infra

Phase 2 Urban Area, '24 ~

Goyang KINTEX
V5
2
Phase 2-2, Hangang
Drone test and certification Center
V1
1
V2
Gyeyang NewTown
V3
Gimpo Airport
2
Yeouido
V4
Jamsil
V6
3
V7
Suseo Station
Phase 2-1, Arabaetgil
Phase 2-3, Tancheon

K-UAM Grand Challenge (GC)

Participating companies

Korean companies + Global eVTOL manufacturer



Into the Urban Sky
UAM Grand Challenge Korea

Ministry of Land, Infrastructure and Transport

KARI 한국항공우주연구원
KOREA AEROSPACE RESEARCH INSTITUTE

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

kakao mobility LGU+ GS건설



K-UAM Grand Challenge (GC)

Demonstration infrastructure deployment status

Phase 1

Establishment of Demonstration Infrastructure in Goheung, Jeollanam-do

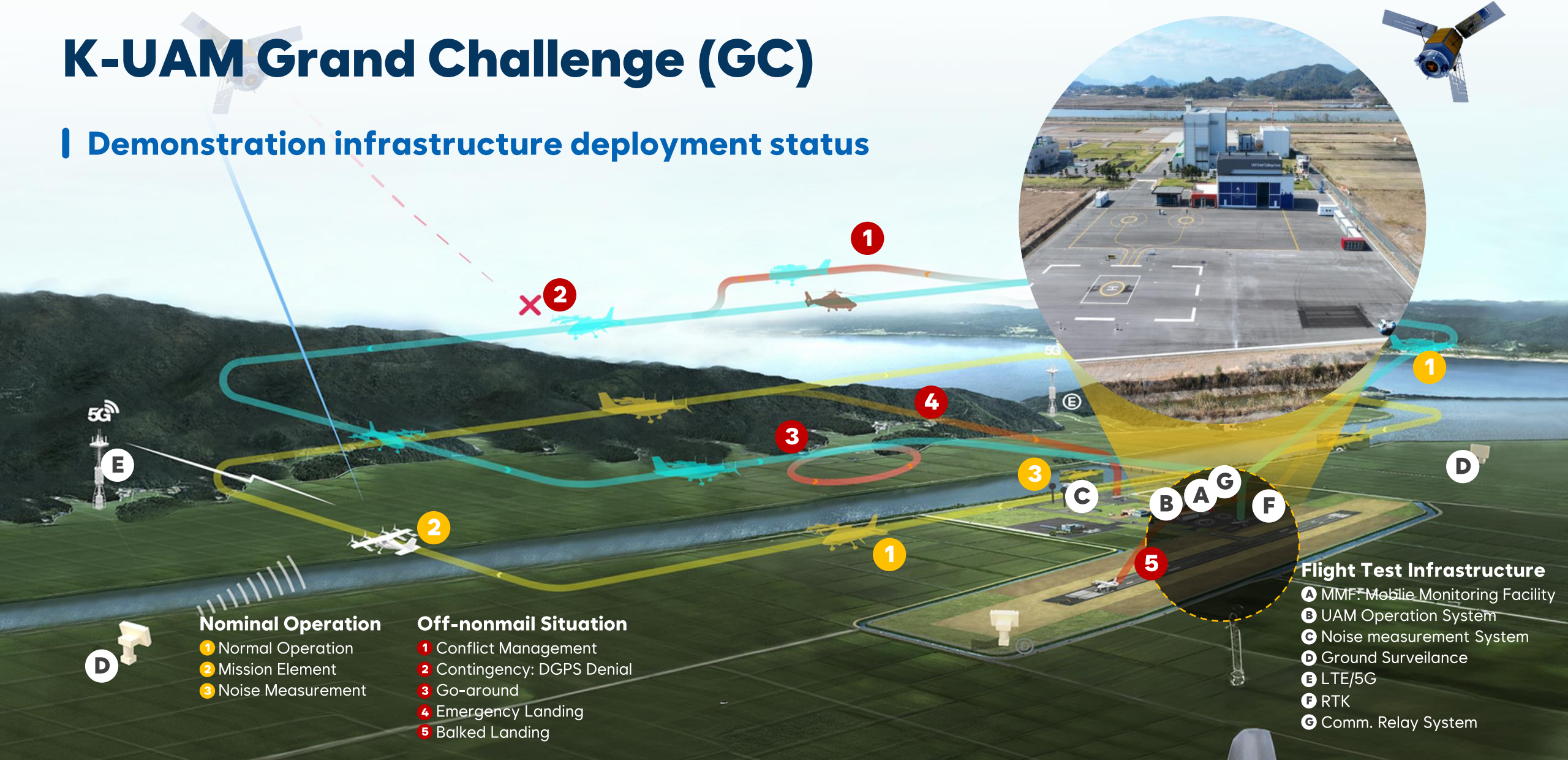
Phase 2

Vertiport in construction process in the urban region Demonstration area



K-UAM Grand Challenge (GC)

Demonstration infrastructure deployment status



Nominal Operation

- 1 Normal Operation
- 2 Mission Element
- 3 Noise Measurement

Off-nonmail Situation

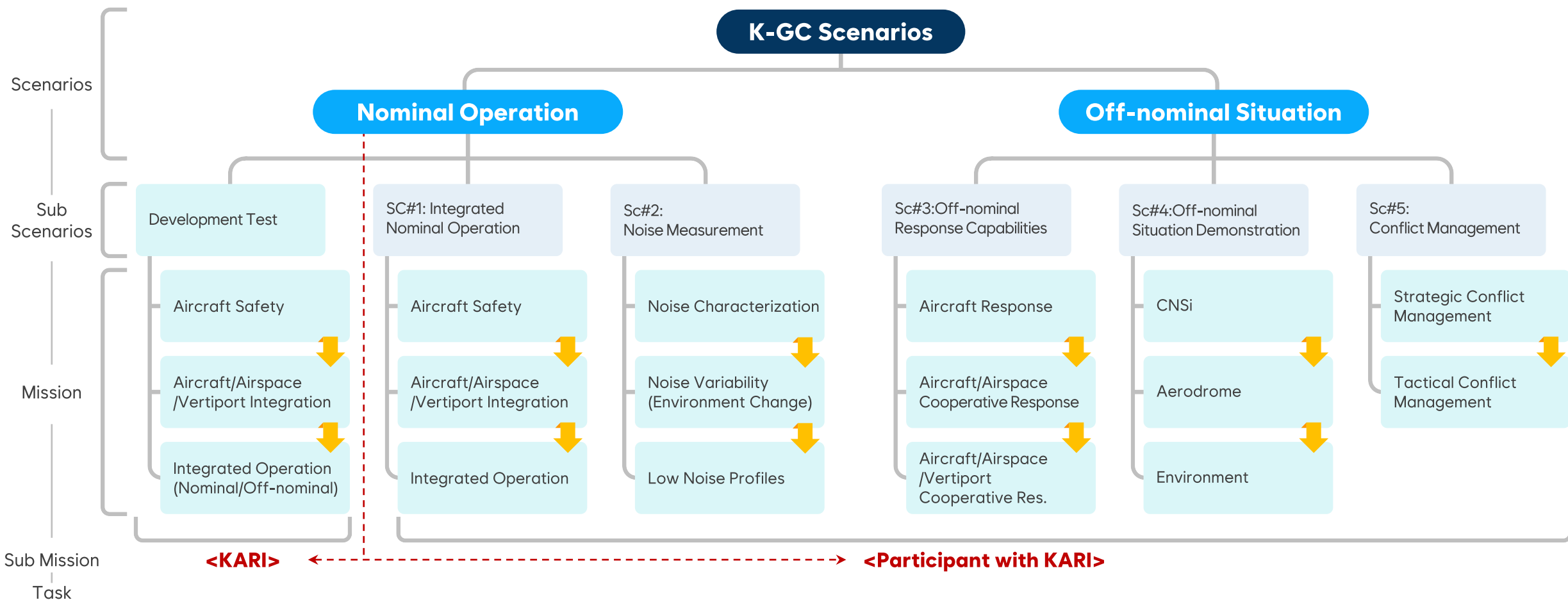
- 1 Conflict Management
- 2 Contingency: DGPS Denial
- 3 Go-around
- 4 Emergency Landing
- 5 Balked Landing

Flight Test Infrastructure

- A MMF: Mobile Monitoring Facility
- B UAM Operation System
- C Noise measurement System
- D Ground Surveillance
- 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.



SKYTALKS

Thank You.

For more details,
please visit the UAM Team Korea Pavilion



※ Contact : uamteamkorea@naver.com

