



**UAM Team Korea**  
Open the Urban Sky

# Introduction to the K-UAM

**NASA AEGW International AAM Day**

**2021. 3.**



Open the Urban Sky

## ◎ Korea Aerospace Research Institute (since 1989)

- A government funded organization to lead civil aerospace R&D
- Four main R&D Directorates : Aeronautics, Satellite, Space Launcher and Future Tech
- Locations : HQ @Deajeon, Flight Center & NCFPTC\* @Goheung, Space Center @Naro and Tracking Station @Jeju
- R&D projects for UAM
  - ✓ Optionally Piloted PAV(OPPAV) Project
  - ✓ UTM, low noise prop-rotor design, autonomous landing, and GTE based hybrid propulsion, etc.



[OPPAV]



[Location]

\*NCFPTC: National Comprehensive Flight Performance Test Center

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**K-UAM ROADMAP**

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**UAM TEAM KOREA**

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**K-UAM GC**

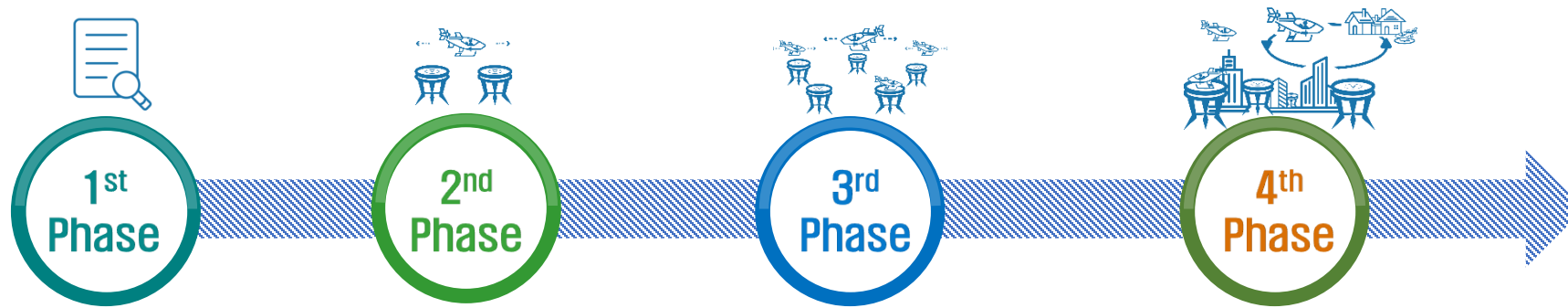
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**K-UAM R&D PROJECTS**



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## ◎ Government leading roadmap for UAM in Korea (June '20)



### Preparation stage (2020-2024)

- Explore issues and challenges
- Revise related laws and regulations
- Test and demonstrate civil usage

### Initial stage (2025-2029)

- Commercialize some routes
- Connect inner and outer city hubs
- Establish linked transportation system

### Growth stage (2030-2035)

- Expand routes
- Place hubs in the core city
- Turn into Business profit-making

### Mature stage (2035- )

- Generalize UAM transportation
- Create Intercity routes
- Conduct autonomous operation

## ◎ 6 Key Strategies of K-UAM (Policy) Roadmap

1 Revise Regulatory Framework for UAM

Conduct the “K-UAM Grand Challenge” to set up K-UAM regulatory frameworks

2 Create Robust UAM Ecosystem

Designate regulation-free special zones for UAM operation and demonstration

3 Phased Services to Increase Public Perception

Begin cargo delivery service prior to passenger on board service

4 Build Infra. considering Multi-modal Transport

Join PPP-funding for a large-scale capital investment required by infrastructures such as vertiport

5 Support Sustainable and Healthy Ecosystem

Prepare rules of UAM operators(fleet operators, etc.) referring to those of ground transport

6 Expand International Cooperation

Join and support international cooperative works on UAM

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## ◎ UAM Team Korea, a public-private cooperation body, focusing on K-UAM

### 8 Major Tasks of the UAM Team Korea

1. Continue to implement the K-UAM roadmap and **discover new policies and R&D projects**
2. **Support and join K-UAM GC**
3. Common field of interests of participating organizations are jointly ordered as cooperative project of participating organizations
4. Share the acquired information of market and technology trends with UAM Team Korea member
5. Support to strengthen the UAM ecosystem
6. **Prepare the UAM special law (2023 goals)** according to K-UAM roadmap
7. National level major conferences plan and host, marketing to major customers, and Investment attraction
8. Joint marketing to public services major customers in defense, fire fighting, police, forestry, and medical fields





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## ◎ Goals of K-UAM GC


- Evaluate the safety and reliability of UAM under Korean environment before launching initial commercial service in Korea in '25.
- Provide technical basis for the K-UAM regulatory frameworks, which will be established in '23, by demonstrating key features of UAM at remote area, airport, and urban area
- Encourage collaborative UAM R&DT and ecosystem building through Public-Private Partnerships

## ◎ Strategy of K-UAM GC

- Who wants to provide UAM commercial services in Korea, will be asked to show safety compliance in Korean environment and K-UAM GC will be a good chance
- K-UAM GC is a demonstration program and other R&D projects are being prepared to fill the technical gaps
- The detail GC information, such as how to participate, what are required and benefits, will be announced in the mid of this year by MOLIT

## ◎ K-UAM GC schedule

Programs	20	21	22	23	24	25
K-UAM GC Program		GC 0				
			GC 1			
				GC 2		
				Ex-Urban		
					Urban	

\*)  : flight test or execution phase



[GC 1@NCFPTC]



[GC 2 @exUrban 1]



[GC 2 @exUrban 2]



[GC 2 @Urban 1]



[GC 2 @Urban 2]



[Simulation]

\*NCFPTC: National Comprehensive Flight Performance Test Center

## ◎ Scope of K-UAM GC\*



\* Will be finalized and announced in the mid of '21 by MOLIT

## ◎ K-UAM GC Test Infrastructures

- Mobile test facilities for the phased approach of the GC

### Structures @ FTC\*

(Elevated) FATO (40x40), Hanger(40x20), Apron, etc

### Mobile Noise LAB

WAMS<sup>1</sup>, Aircraft tracking equipment, Lidar, Mobile LAB(DAQ, trailer), etc

### Mobile GSE\*\*

Mobile charger(200kW), Stationary super charger(400kW), etc

### Mobile CNS facilities

Radar, ADS-B, RTK, CEAS<sup>2</sup>, On-board K-CNS device

### Mobile MMF\*\*\*

Aircraft monitoring, Navigation/Test Management, Comm./DAQ, etc

\*FTC : Flight Test Center

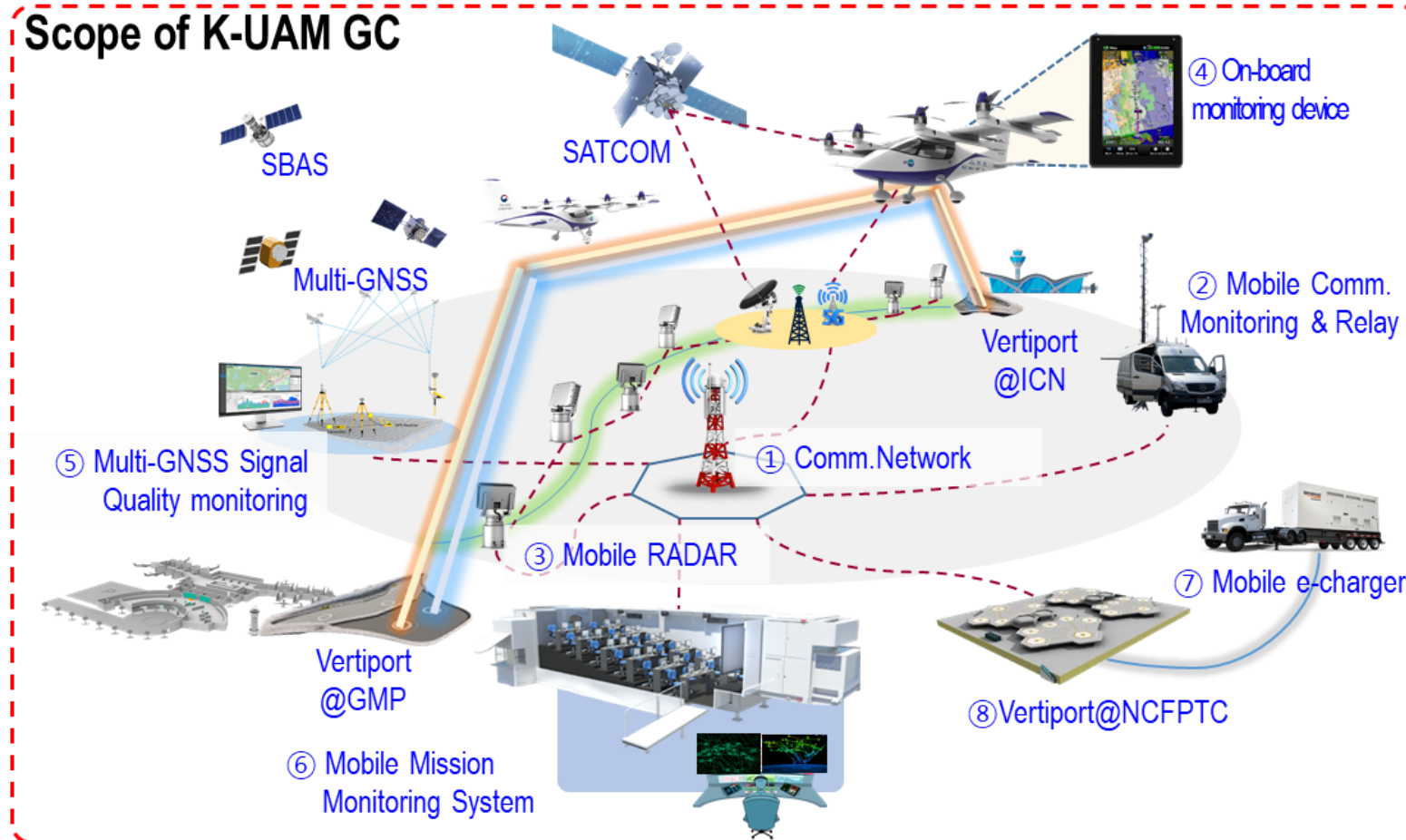
\*\*GSE : Ground Support Equipment

\*\*\*MMF : Mission Monitoring Facility

1) Wireless Acoustic Measurement System

2) Communication Environment Analysis System

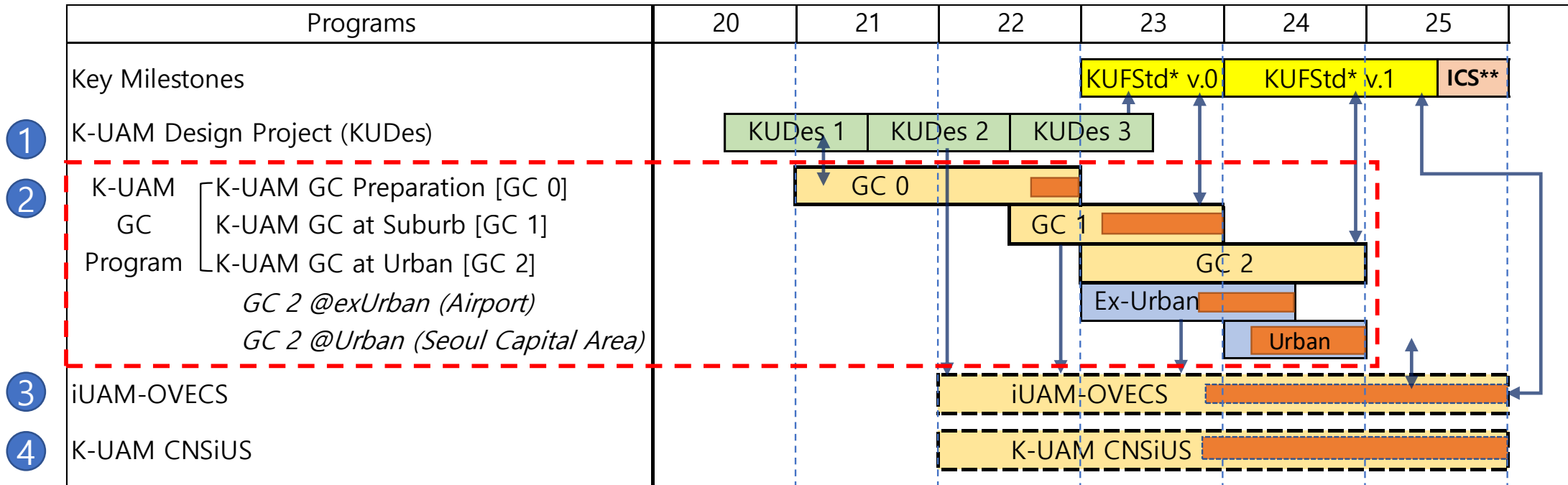
## ◎ Concept of K-UAM GC CNSi



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## ◎ Programs to execute the K-UAM Roadmap for ICS in `25



(KUFStd) K-UAM Flight Standard / (ICS) Initial Commercial Service /  : flight test or execution phase

iUAM-OVECS: Developments of Integrated UAM Operation and Verification Environment based on Cyber physics

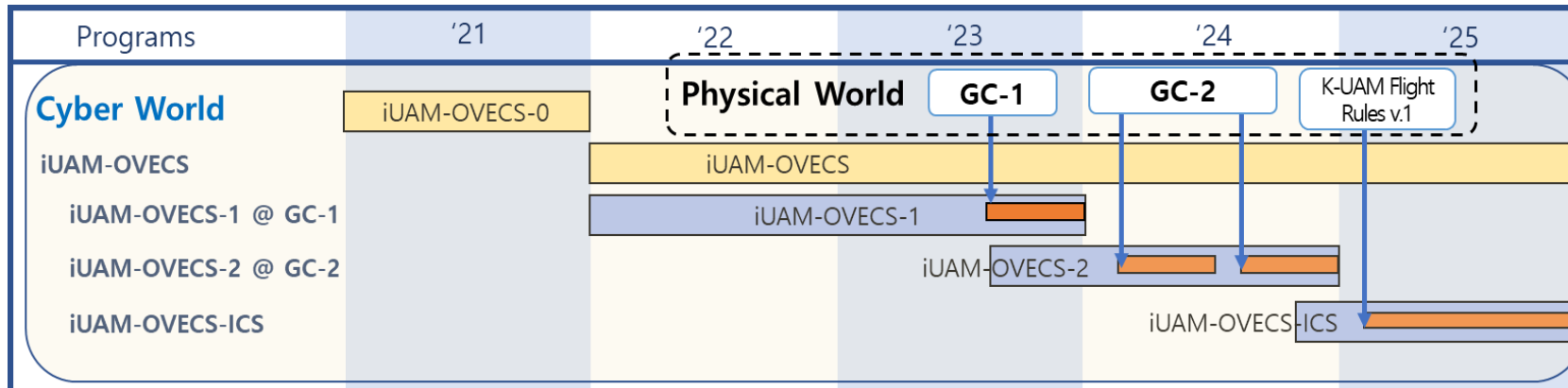
K-UAM CNSiUS: K-UAM CNSi Acquisition & Utilization Program

Initial Commercial Service (ICS)

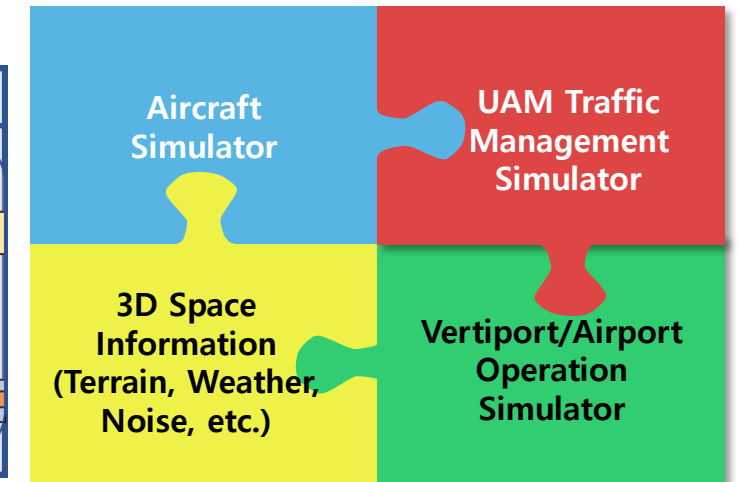


## ◎ iUAM-OVECS\*

- Develop a CPS\*\* to validate K-UAM GC operational safety during the GC, verify the K-UAM Flight Rules, and to support initial commercial service in '25
- Interconnect physical components and cyber components in K-UAM environment
- Verify operational procedures, communications among stakeholders, supplementary data services, and licensing requirements
- Step by step approach to support K-UAM programs in time



[Step by step approach]



[Key components of the CPS for K-UAM]

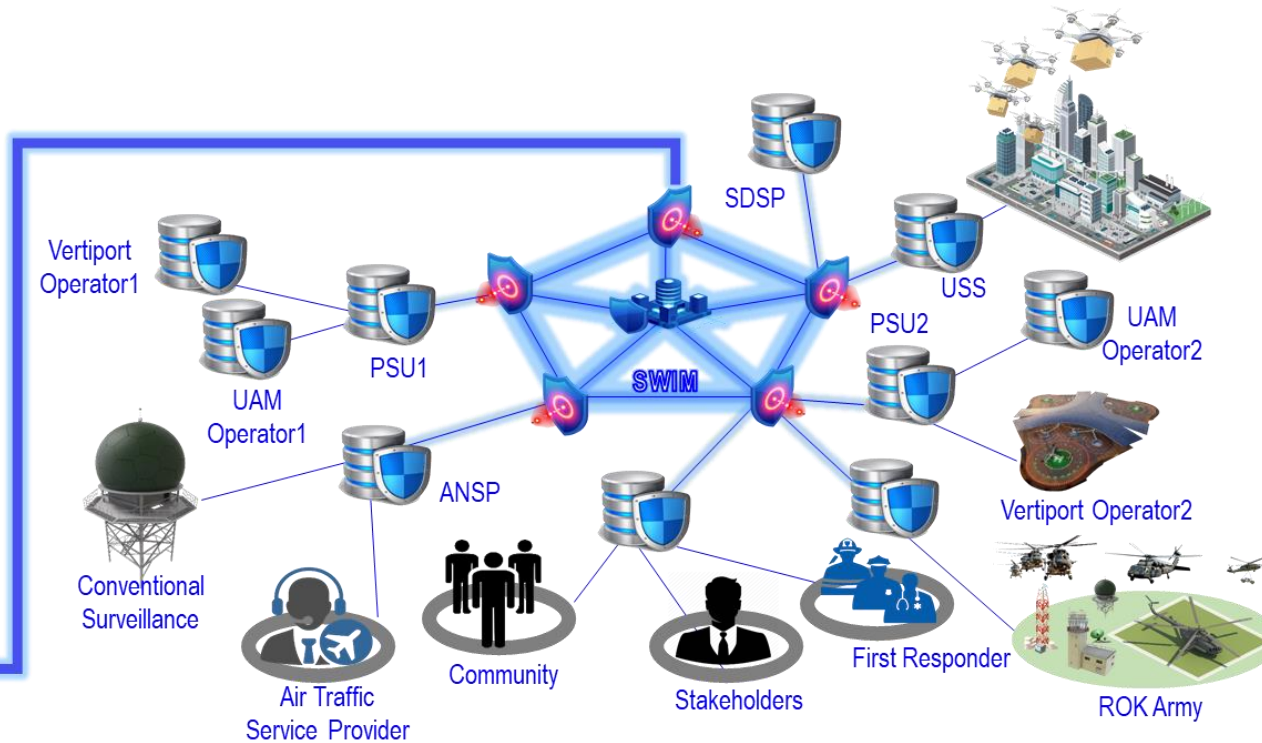
\* iUAM-OVECS: Developments of Integrated UAM Operation and Verification Environment based on Cyber physics

\*\* CPS: Cyber-Physical System

## ◎ K-UAM CNSiUS\*

- Establish CNSi infrastructure and operation system at initial commercial service routes
- Secure and share CNSi data, based on commercial mobile network, among stakeholders
- Demonstrate K-UAM CNSi and ATC integration to forecast K-UATM after 2030

### Scope of K-UAM GC



[Key components of the CPS for K-UAM]

\*K-UAM CNSiUS: K-UAM CNSi Acquisition & Utilization System

- ◎ **K-UAM roadmap, UAM Team Korea, K-UAM GC, R&D projects, and more are being prepared in Korea**
- ◎ **International participations are welcome to any K-UAM activities**
- ◎ **But the more prepare, the much more needed**
- ◎ **Let's gather global efforts on UAM**
  - NASA's AAM International Day is a great chance to begin international collaborative work
  - Make a regular and formal channel where we can share and discuss our UAM activities

**Thank you**  
**감사합니다**

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**Team**  
**Korea**



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