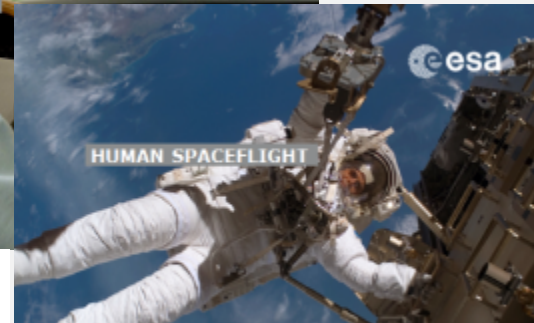


INTEGRATED SPACE APPLICATIONS IAP – NEW TENDERS

8th September 2016

Miranda Saarentaus, Geowise Oy

ARTES APPLICATIONS & SERVICES INTRODUCTION



“To provide for and promote, for exclusively peaceful purposes, cooperation among European states in space research and technology and their space applications.”

Article 2 of ESA Convention



Space based applications for sustainable services based on SATCOM, SATEO, SATNAV, SATAIS, SATADS-B, Space Situational Awareness, Human Space Flight, ...



ARTES APPLICATIONS PROMOTION SCOPE



Sustainable services based on

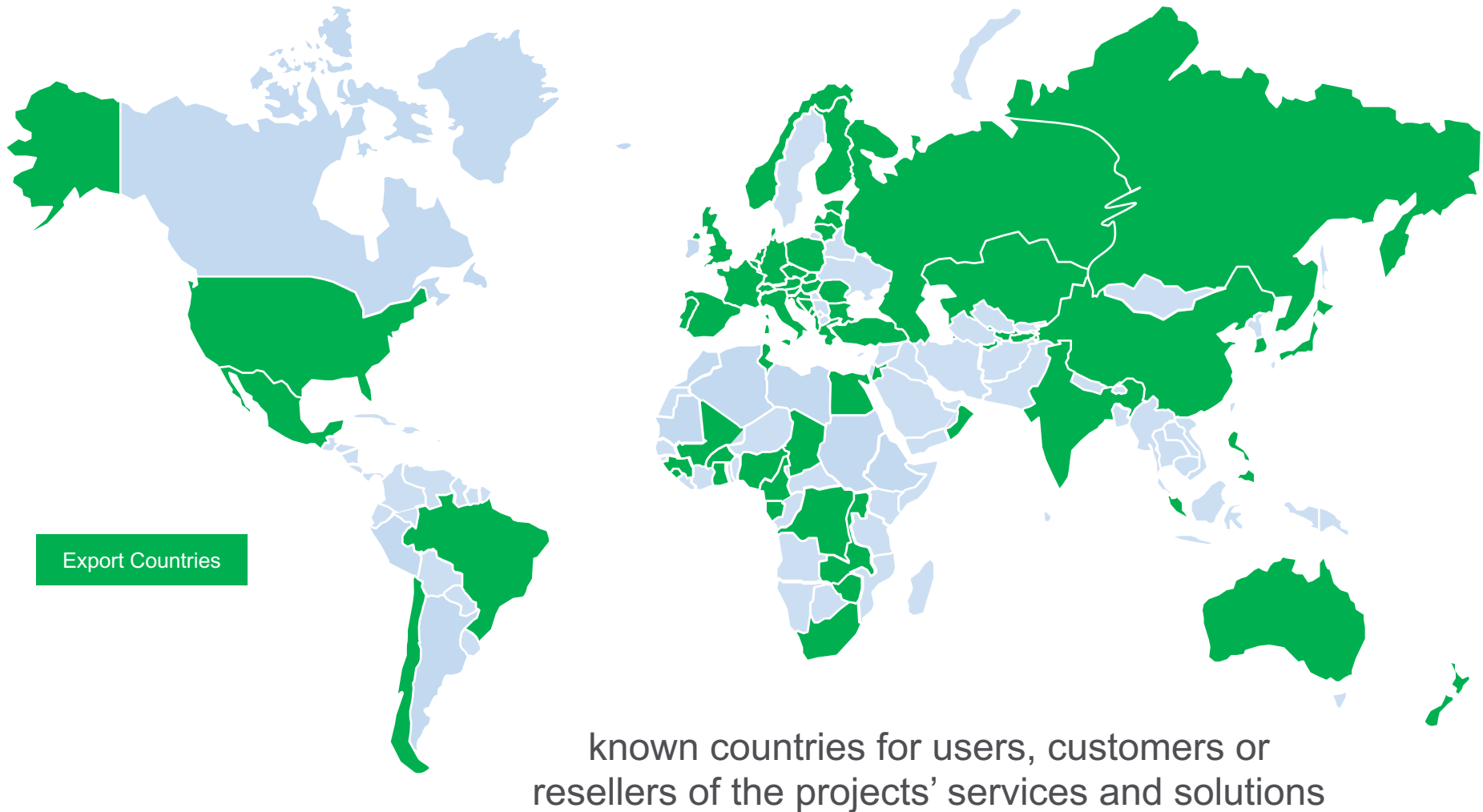
- SATCOM
- SATEO
- SATNAV
- SATAIS
- SATADS-B
- SSW
- HSF
-
-

in combination with terrestrial systems!

The Offer

- ☐ One stop shop for downstream applications
 - ☐ Financial support
 - ☐ Technical & Business expertise
 - ☐ Promotion
 - ☐ ESA “branding”
 - ☐ Networking
 - ☐ Access to 3rd party funding

Strong export led projects

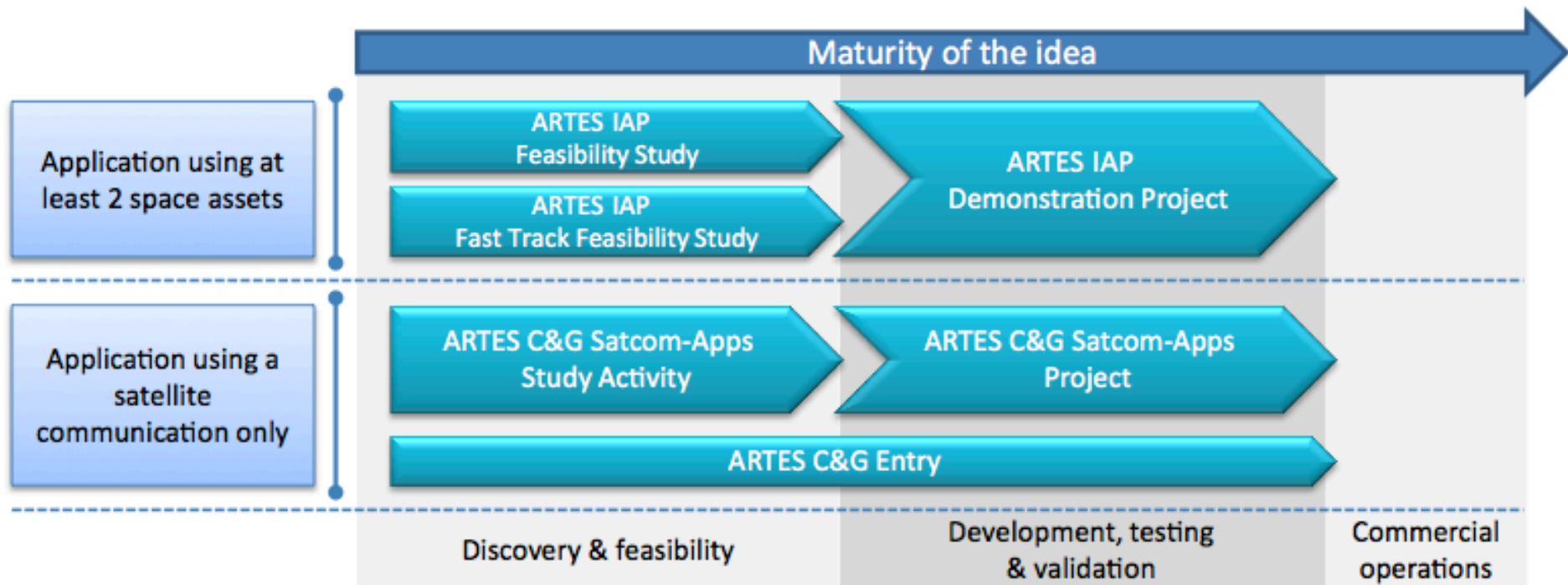


ARTES INTEGRATED APPLICATION PROMOTION PROGRAMME



- In September 2016, new tenders for **fully funded Feasibility Studies** are planned for ESA's Integrated Applications Promotion (IAP) Programme.
- The subjects are:
 - **Waste Management**
 - **Big Data Applications to boost Preparedness and Response to Migration**
 - **Integrated applications including in particular the Automatic Dependent Surveillance – Broadcast (ADS-B)**
 - **Space based services in support of CBRNe operations** (*has been approved in May 2016, more information will be available soon*)
 - **Space based Services integrating 'Internet of Things'** (*has been approved in May 2016, more information will be available soon*)

- **IAP Feasibility Studies** focus on assessing and developing the business case for applications and services based on the integration of space assets (*Satellite Communication, Satellite Navigation, Satellite Earth Observation, Manned Space Flight technologies, etc.*) with existing assets of the targeted customers and market segments.
- As a follow-on, ESA IAP offers the opportunity to validate cases which are considered technically feasible and economically viable through an IAP Demonstration Project.



IAP

UPCOMING COMPETITIVE TENDERS

Feasibility Studies	Budget	Status	Timeline ITT
Competitive tender activities approved by JCB and subject for implementation			
Assessing the potential of future maritime applications in the context of VDE (VHF Data Exchange System) (9C.061)	150 k€	WP 2015 (OC) (Nov JCB)	ITT opening period: 24May- 30Sep2016 AO-8593
Big data applications to boost preparedness and response to migration (9F.048)	150 k€	WP 2015 (OC) (Nov JCB)	ITT opening period: Sep-Dec 2016
Exploring the viability of integrated applications including in particular Automatic Dependent Surveillance – Broadcast (ADS-B) (9C.063)	250 k€	WP 2016 (OC) (Feb JCB)	ITT opening period: Sep-Dec 2016
Space based Support Services for Waste Management (9E.044)	250 k€	WP 2016 (OC) (Feb JCB)	ITT opening period: Sep-Dec 2016
Space based Services in Support of CBRNe Operations (9B.058)	250 k€	WP 2016 (OC) (May JCB)	ITT opening: Nov/Dec 2016
Space based Services integrating 'Internet of Things' (9F.054)	150 k€	WP 2016 (OC) (May JCB)	ITT opening: Dec 2016

WASTE MANAGEMENT



- Topics identified by user communities for Space-based services with terrestrial technologies:
 - **Logistics and recycling of commercial / industrial / domestic waste**
 - **Biomass / anaerobic digestion and greenhouse emissions**
 - **Landfill issues and illegal waste dumping**
 - **Or any other waste relates topic with business opportunity**
- <https://artes-apps.esa.int/opportunities/intended-tender/waste-management>
- **Registration: esa-star**
<https://esastar-emr.sso.esa.int/>
- Support: Kirsi.onnela@esa.int

- Open: end of September
- Close: 2nd week of December
- Expected budget 250 k€, duration 9 months

**BIG DATA
APPLICATIONS TO
BOOST PREPAREDNESS
AND RESPONSE TO
MIGRATION**

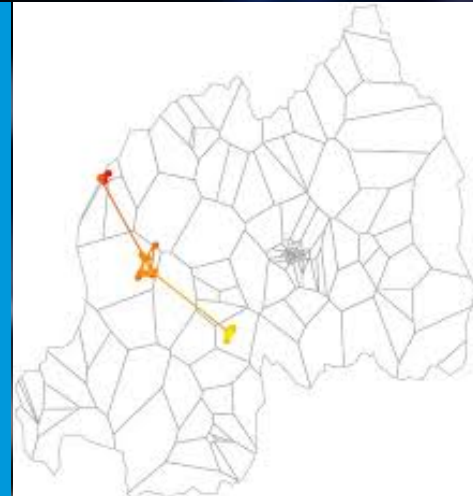


- Europe is being confronted with the most significant influxes of migrants and refugees in its history
- One burning issue is the lack of timely information on migration trends, flows and rates
- The objective:
 - **To carry out an analysis of the technical feasibility and commercial viability of big data processing applications in combination with space-based services**
- <https://artes-apps.esa.int/opportunities/intended-tender/big-data-applications-to-boost-preparedness-and-response-to-migration>

- Open: end of September
- Close: 2nd week of December
- Expected budget 150 k€, duration 6 months

Why Big Data?

- Big data applications have been recognized as a potentially powerful tool to provide direct and indirect indicators of migration trends and human movements.
 - Blumenstock 2012 to track migration patterns in Rwanda from call detail records
 - Studies on use of geo-located social media (Twitter) data to infer migration trends.
 - ...



Which Data?

- Geolocated social media (e.g.: Facebook, twitter)
- Geolocation provided by smartphone's apps
- IP addresses of website logins and sent e-mails
- Call detail records
-



Why space tech?

- Direct and indirect indicators of migratory flows (e.g.: information on socio-economic factors , unusual human activities, etc.) derived from EO data to provide a medium term human migration forecast (relevant to the mitigation phase)
- RPAS are typically part of humanitarian relief activities may provide valuable info
- GNSS

INTEGRATED APPLICATIONS USING ADS-B

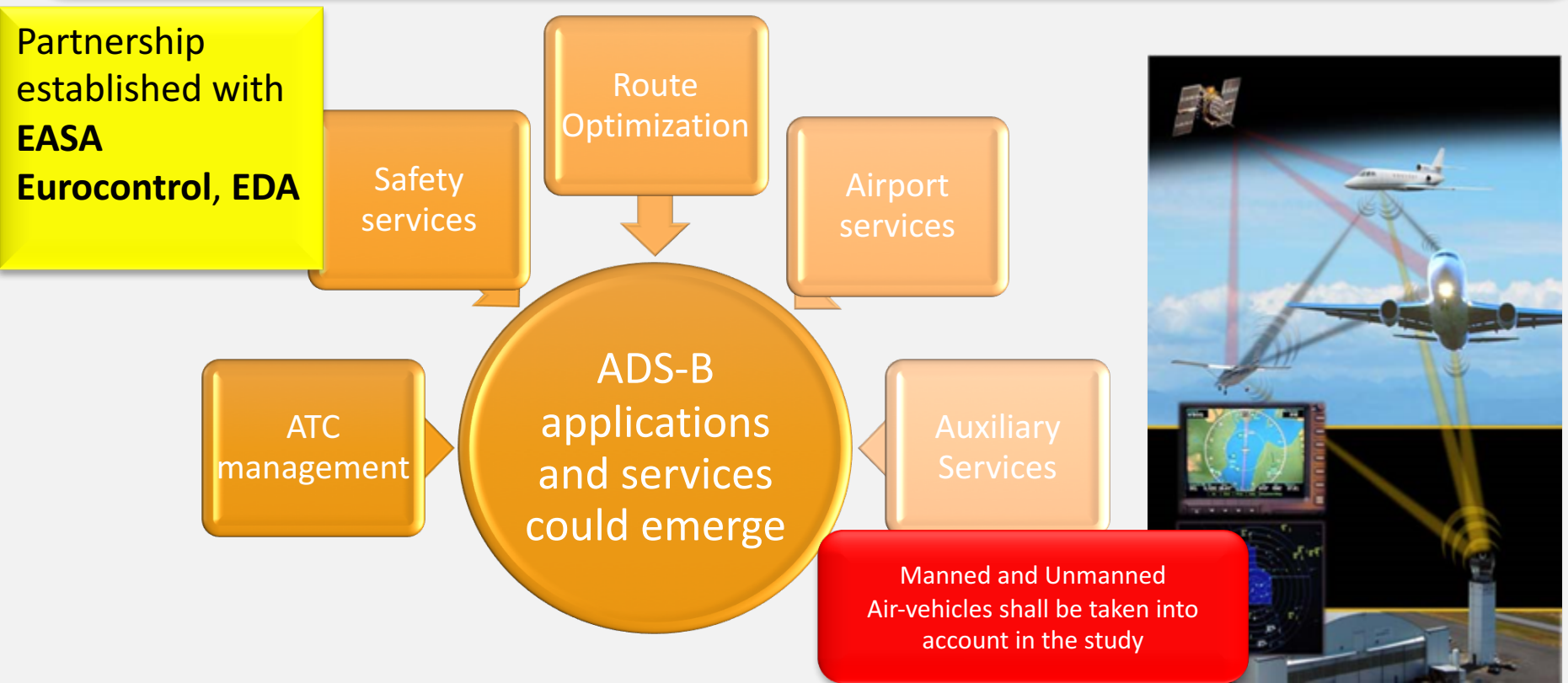


- The Automatic Dependent Surveillance-Broadcast (ADS-B) is a cooperative surveillance technology in which an aircraft determines its position via satellite navigation and broadcasts it periodically, enabling the tracking of the aircraft
- <https://artes-apps.esa.int/opportunities/intended-tender/integrated-applications-using-ads-b>
- Expected budget 250 k€, duration 9 months

- Open: end of September
- Close: 2nd week of December
- Expected budget 250 k€, duration 9 months

IAP ADS-B ACTIVITY: INTENDED INVITATION TO TENDER TO **INTEGRATED APPLICATIONS USING ADS-B**

Feasibility Study Objectives: to identify and characterize ADS-B based services addressing potentially interesting application domains, carry out the analysis of their technical feasibility and commercial viability, select the most promising ones for further development and exploitation, and propose a roadmap for the implementation and demonstration of the proposed services.



SPACE BASED SERVICES IN SUPPORT OF CBRNE OPERATIONS



- Focus on sustainability of selected CBRNe services. Establishing necessary contacts with stakeholders, developing a technical framework, and defining sustainable business case(s)
- Promote synergies among Member States to avoid possible duplications of solutions and procedures and to ensure the best possible complementarity

- Opening Nov/Dec 2061
- Expected budget 250 k€, duration 9 months

SPACE BASED SERVICES IN SUPPORT OF CBRNE OPERATIONS



- CBRNEe - Expressed interests so far:
 - Fact finding information before embarking on risky missions in foreign countries as well as during these missions
 - Data transfer/ communication connecting remote areas and field teams to their headquarters
 - Training and simulation
 - Unmanned inspections and automated sensor measurements, e.g. using RPAS and/or other robotic devices

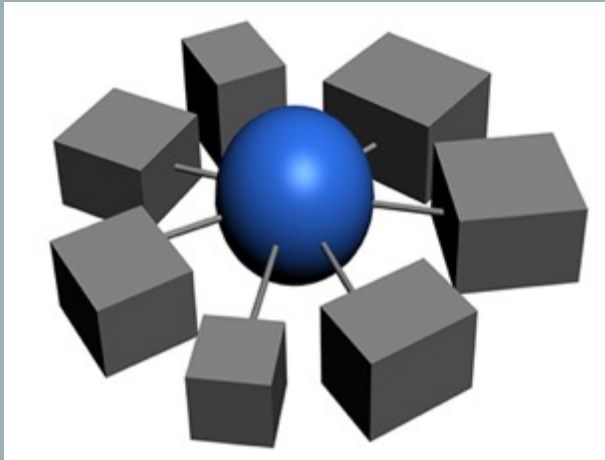
SPACE BASED SERVICES INTEGRATING 'INTERNET OF THINGS'



- Some of the key capabilities, that IoT/M2M services and applications rely on, include:
 - global interconnectivity, robust communication, geo-localisation, positioning, timing, remote monitoring, in-situ and remote sensors, technology for harsh environments, geo-information and environmental data, storing, etc.
- The objective is to identify and investigate those applications and deployment opportunities of IoT/M2M solutions that can benefit from capabilities enabled through Satellite Communication, Satellite Navigation, Earth Observation, Human Spaceflight, and other space assets

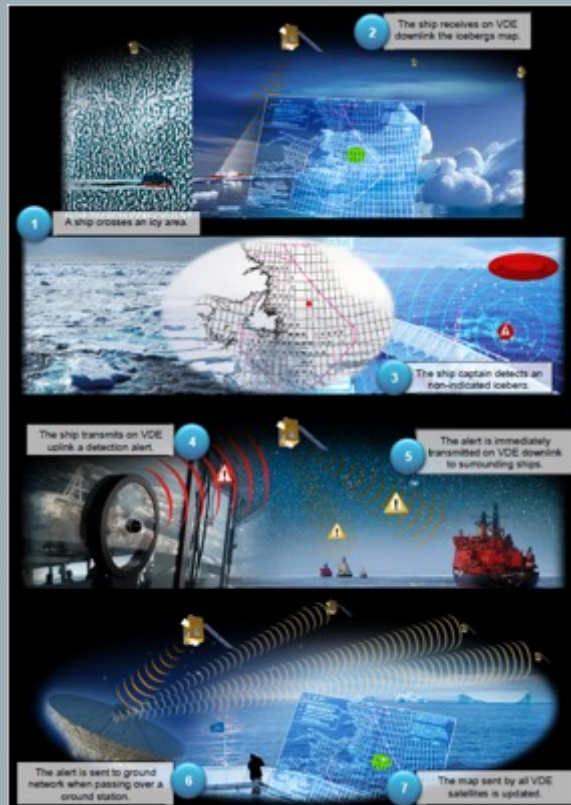
- Opening Dec 2061
- Expected budget 150 k€, duration 9 months

SPACE BASED SERVICES INTEGRATING 'INTERNET OF THINGS'



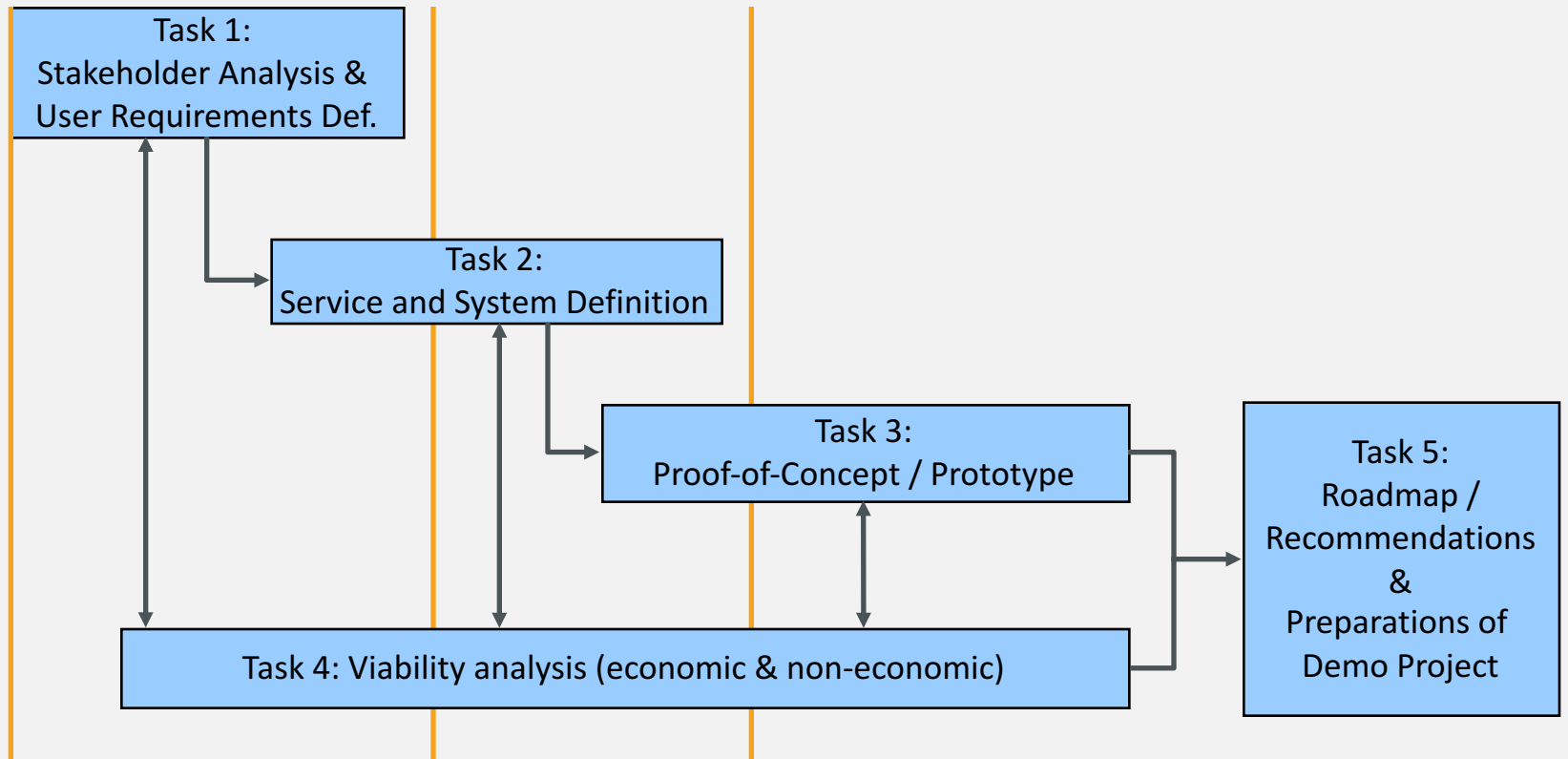
- User Community:
 - Human: devices attached to or inside the human body
 - Home: buildings where people live
 - Retail environments: any spaces for commerce where consumers buy
 - Offices: places where knowledge workers work
 - Factories: standardized production environments
 - Worksites: custom production sites, including oil rigs, mining, construction, etc.
 - Vehicles: systems inside vehicles, including cars, trucks, trains, aircraft, and ships
 - Cities: urban environments
 - Outside: between urban and outside any other environment

ASSESSING THE POTENTIAL OF FUTURE MARITIME APPLICATIONS IN THE CONTEXT OF VDE



- Call Documents:
 - Invitation-to-Tender
 - Statement-of-Work
 - Contract
 - Tendering-Conditions
 - Proposal template
- Budget: 150 000 Euro
- Planned duration: 9 months
- ITT is open, closing date : 30 September 2016

TYPICAL TASKS OF A FEASIBILITY STUDY



Negotiation
Meeting /
Kick-off (KO)

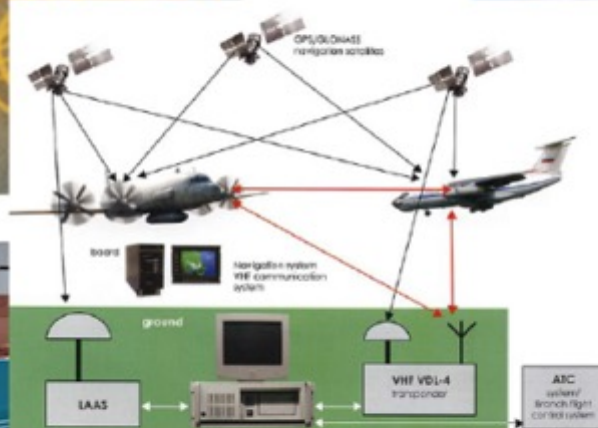
Study Logic of Feasibility Study

NEW DOMAINS FOR SPACE BASED APPLICATIONS & SERVICES

Automated and connected cars



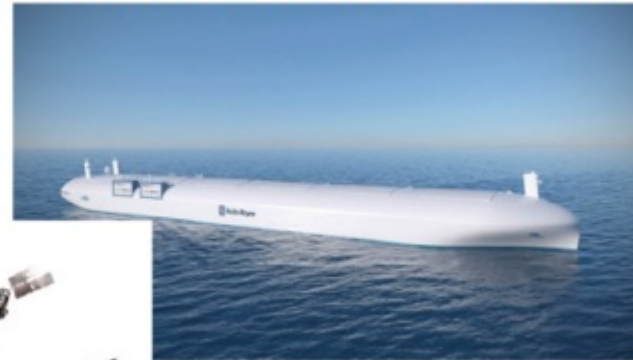
ADS-B



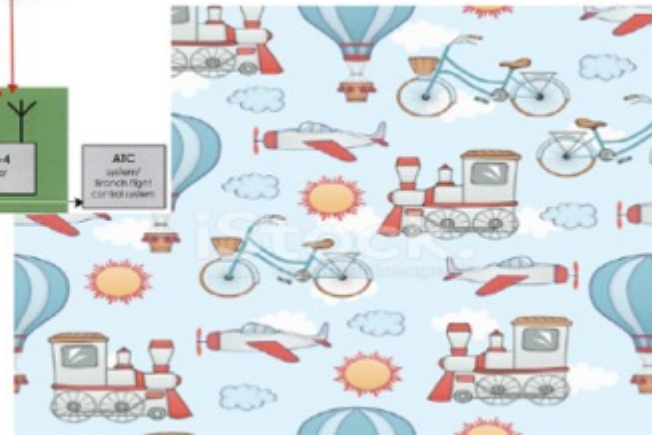
VDE



Unmanned Maritime Vehicles



Unmanned transportation



IAP PHASE 3 PROPOSED ENHANCEMENTS

Widen IAP scope

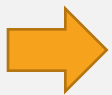
Modify the criteria “..to integrate and combine several different space technologies..”

Increase IAP
Outreach

Increase financial support for SMEs to 75%

Introduce “Enabling” activities as early incubators of services

Introduce “Kick-Start” activities as easy entry in IAP



Revision of the IAP Element Declaration and Specific
Implementing Rules

Subject to approval of JCB in September 2016

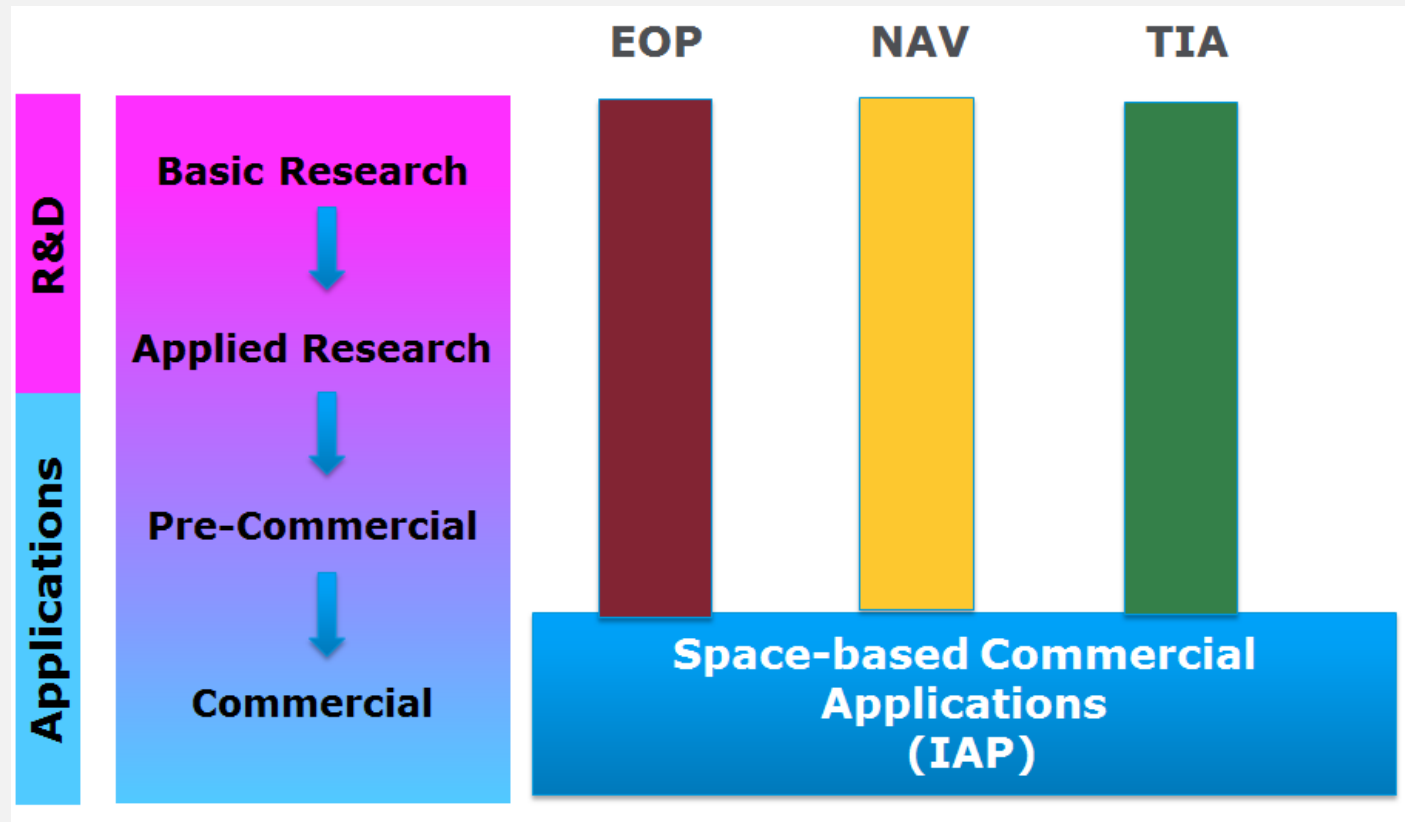
KICK-START ACTIVITIES



- Proposal for approval during the C-MIN 2016
- Kick-start activities are a subcategory of Feasibility Activities to be initiated by Partners (industry, operator or public institutions) following thematic calls for ideas or opportunities initiated by the Agency
- Kick-start activities aim at exploring the viability of new service/application concepts and consolidating the user landscape including derivation of user requirements
- 60kEUR fixed budget envelope, 50%-75% funded by ESA
- Fast implementation: target of 6 weeks from closure of the call to start of the activity
- Possible Themes:
 - Automated road transport (driverless cars, autonomous trucks,...), Life sciences/Health, Food and water security, Cyber security for financial services and other applications, Infrastructure monitoring (transport infrastructure e.g. railways, energy infrastructure e.g. electricity grids,...), Home and industrial automation, Unmanned maritime vehicles

IAP PHASE 3 – ENHANCEMENTS

FOR APPROVAL AT C-MIN 2016



IAP does the activities for the **development and pilot demonstration of new services** towards the **Commercialisation/Market uptake** part which, in some cases, may start in the pre-commercial part.



SPACE IS OPEN FOR BUSINESS!

Miranda Saarentaus

***Advisor, ESA IAP Ambassador Platform
Finland***

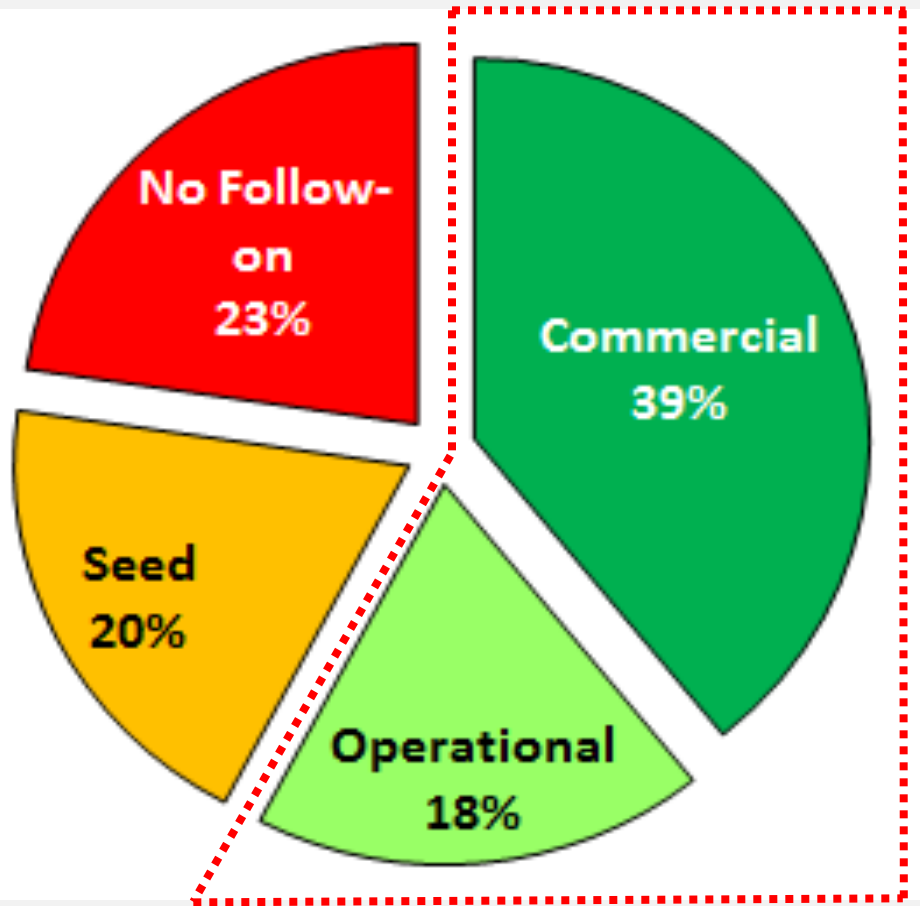
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IAP Applications & Services

“Success Dial” Results

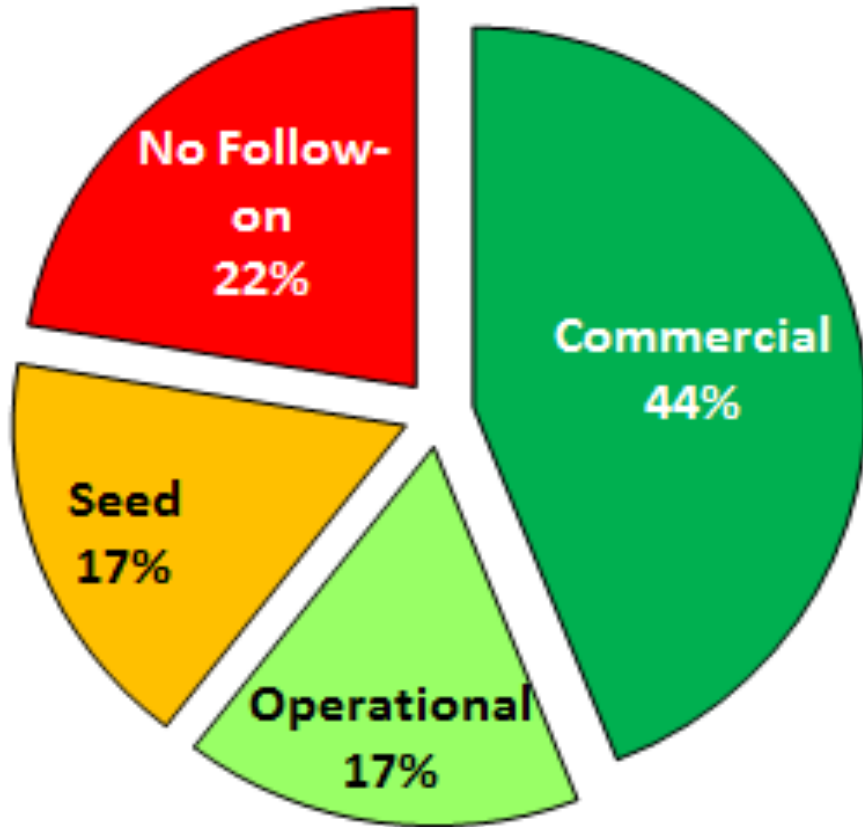


194 on going / completed projects from the ARTES Space Applications / Service Programmes

57% (112) of the projects (commercial and operational slice) have generated successful services

IAP Applications & Services

“Success Dial” for SME led projects Results



Out of the 194 projects **134** are led by **SME's**.

IAP Applications & Services attracting funding from Investors

