Smart Mobility in Smart Cities
WALK. RIDE. DRIVE. FLY

Dr Vassilis AGOURIDAS

UAM Initiative Leader (AIRBUS)

ERRIN,
Transport Working Group

Brussels

11 April 2019

vassilis.agouridas@airbus.com

EIP-SCC

European Innovation Partnership
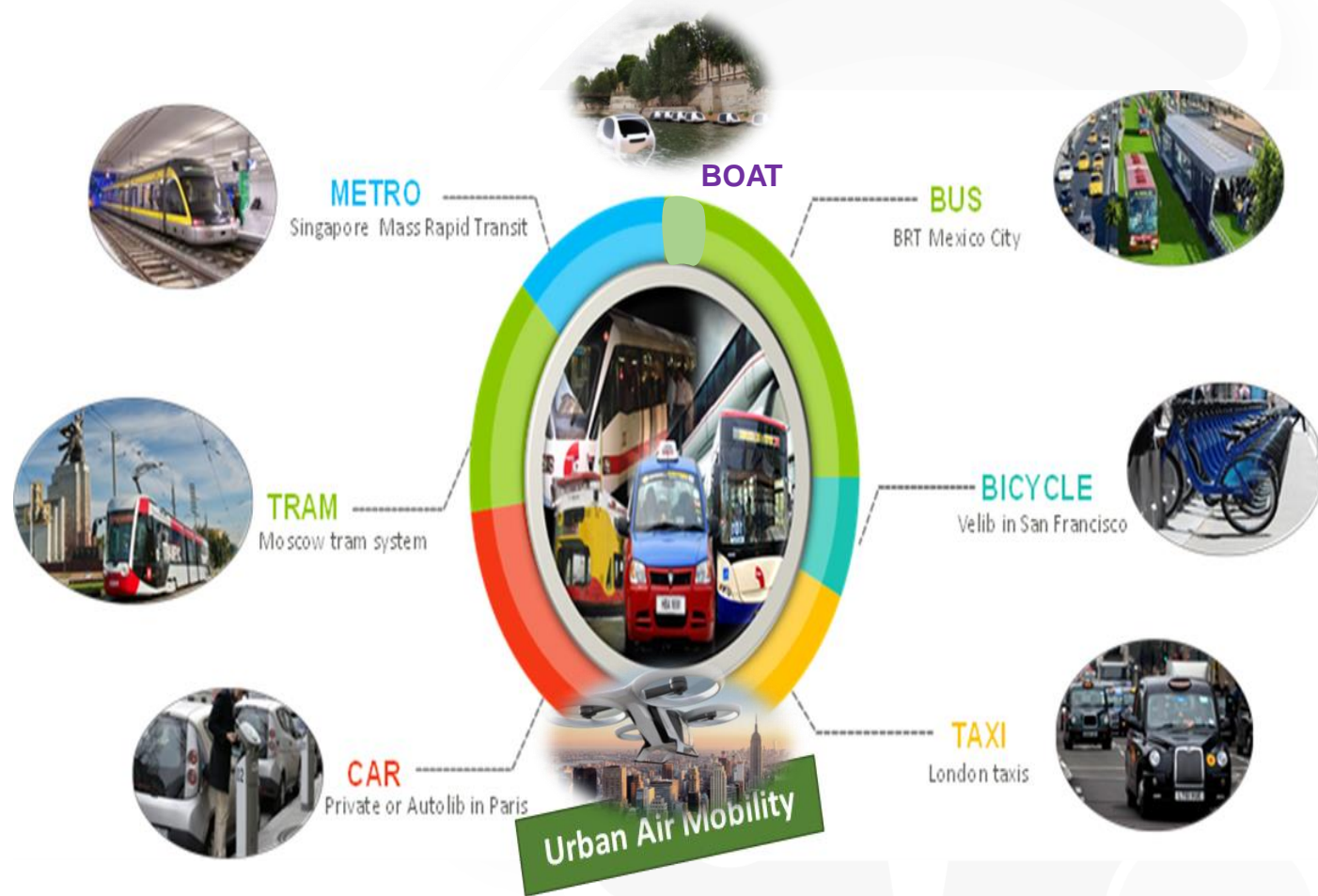on Smart Cities and Communities

Urban mobility is only a part of citywide networks
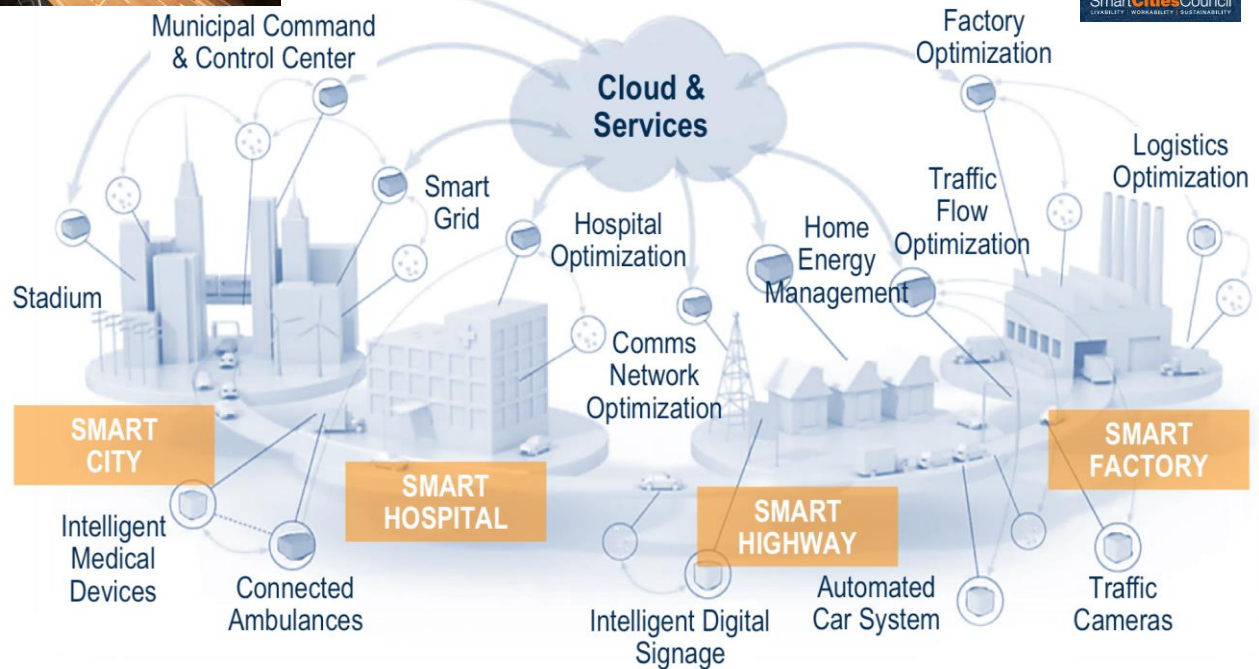
Mobility solutions in smart sities

The motto of the UAM Initiative:

Smart Mobility in Smart Cities:

WALK.

RIDE.

DRIVE.

FLY.

METRO
Singapore Mass Rapid Transit

BOAT

BUS
BRT Mexico City

TRAM
Moscow tram system

BICYCLE
Velib in San Francisco

CAR
Private or Autolib in Paris

Urban Air Mobility

TAXI
London taxis

Typical multimodal mobility solutions in megacities
do not consider air mobility

EIP-SCC
European Innovation Partnership on Smart Cities and Communities

Drone system uses fall into five general categories

Uses		Desc		Impact[2]	Estimated time to maturity,[3] years
1 Surveillance	1a Short-range[1] surveillance	Cond image	eillance s	■ High	Already mature
	1b Long-range surveillance	Cond image	eillance, s	■ High	2–5
	1c Photo/video	Using without	cations	☐ Low	Already mature
2 Operations		Facili tasks	difficult	■ Medium	Already mature
3 Entertainment/advertising		Lever adver	ain or	☐ Low	Already mature
4 Signal emission		Provi	dth by	☐ Low	1–3
5 Movement	5a Transportation	Mov		■ High	10–15
	5b Delivery	Moving objects		■ High	5–10

High ■ Medium ■ Low ☐

Paving the way

3 kinds of applications leveraging on **drones & digitalisation**:

1 Situational awareness - *descriptive* -

2 Prognostics - *predictive analytics* -

3 Real-time optimisation - *prescriptive* -

SmartCitiesCouncil
LIVABILITY · WORKABILITY · SUSTAINABILITY

Scope of the UAM Initiative

Smart Mobility demonstrators interfacing, or enabling, UAM by addressing:

1. **UAM interfaces with *public transport****

2. **Mobility as a Service**

3. **Ground infrastructure for UAM** (e.g. real estate stakes to support UAM (e.g. dedicated UAM landing pads and integration to multimodal net-works hubs, electric charging infrastructure, interoperable data (e.g. traffic communications and V2V, V2I, V2x)

4. **ATM/UTM concepts** for UAM in accordance with the U-Space framework

City-centric & Citizen-driven

* Or other interfaces:
 e.g. logistics platform, emergency services hubs, etc.

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities
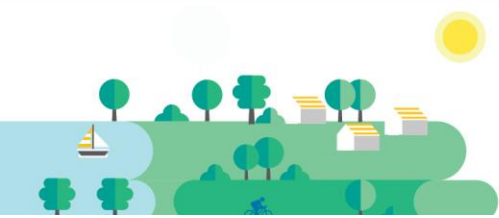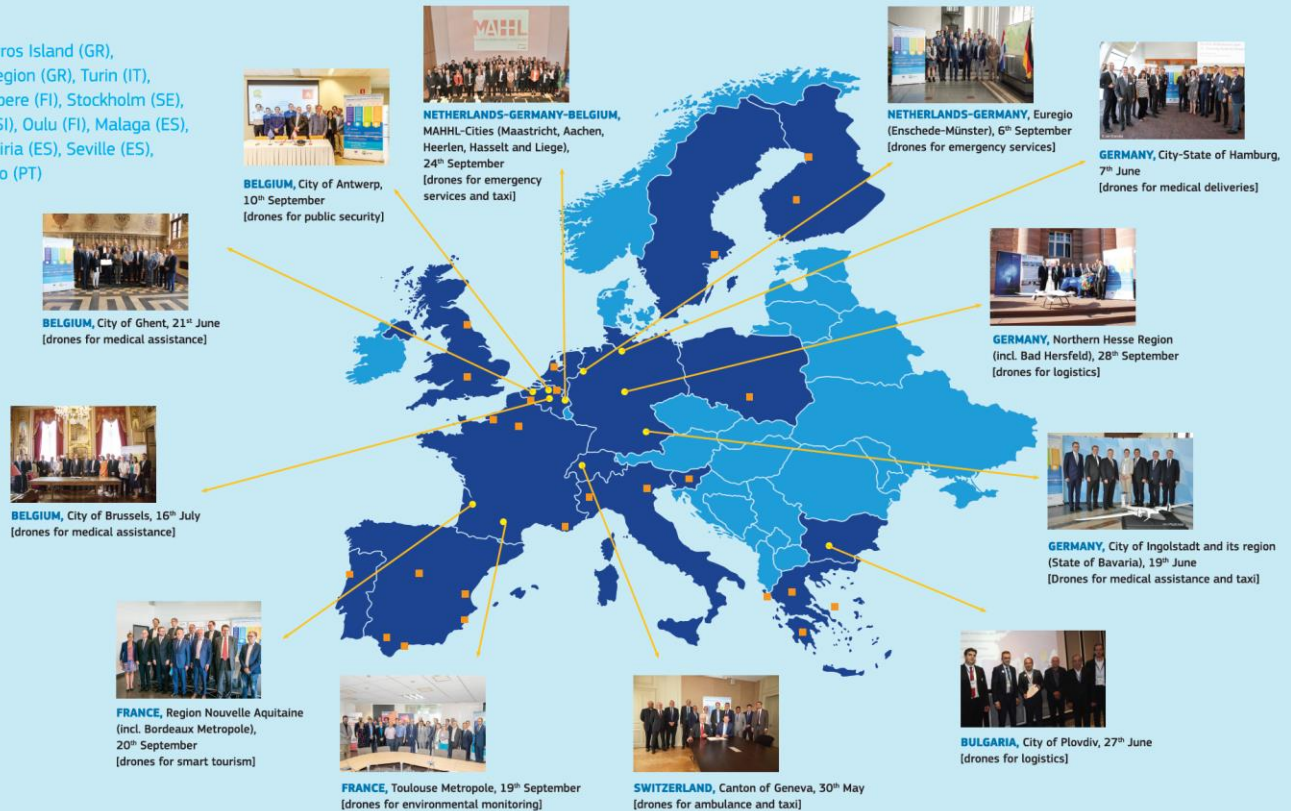
EU Urban Air Mobility

A Community and the Voice of 42 cities / regions

FrontRunners [●] 12 demonstrator projects (17 cities / regions, incl. 2 Cross-border)

Fellows [■] (25 cities / regions)

Madrid (ES), Oxfordshire County (UK), County Durham (UK), Skyros Island (GR), Amsterdam (NL), Region of Peloponnese (GR), Ionian Islands Region (GR), Turin (IT), Trikala (GR), Eurometropole: Lille-Kortrijk-Tournai (BE-FR), Tampere (FI), Stockholm (SE), Region Ile de France (Paris Region – FR), Padua (IT), Ljubljana (SI), Oulu (FI), Malaga (ES), Metropolis GZM (PL), Le Havre Metropole (FR), Turnhout (BE), Lliria (ES), Seville (ES), Benidorm (ES), Aix-Marseille Metropole & Region Sud (FR), Porto (PT)
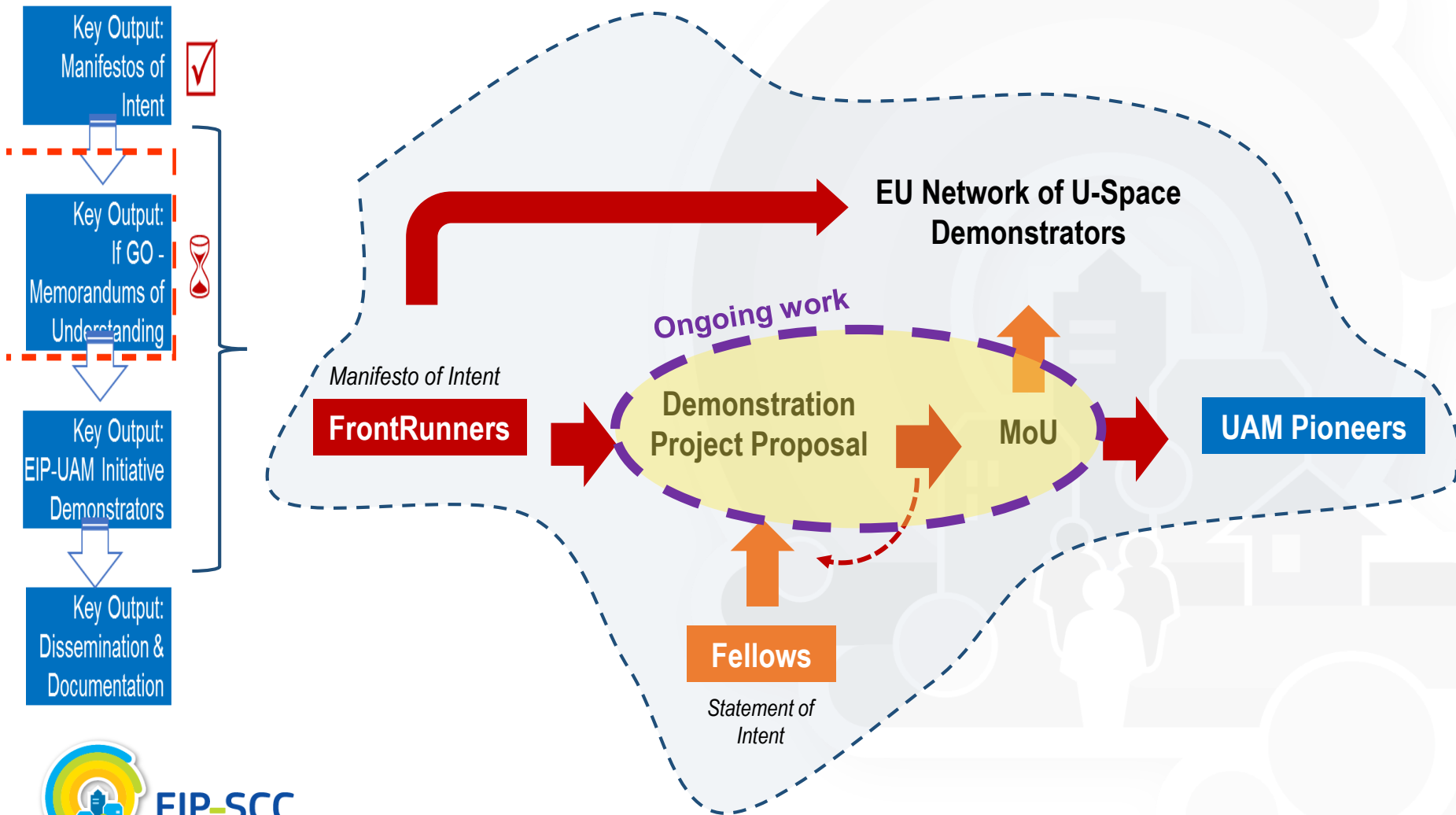
More than **500 diverse stakeholders** mobilised across **Europe** to work on bringing **urban mobility** to the **3rd dimension**!

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

NETHERLANDS–GERMANY–BELGIUM, MAHHL-Cities (Maastricht, Aachen, Heerlen, Hasselt and Liege), 24th September [drones for emergency services and taxi]

NETHERLANDS–GERMANY, Euregio (Enschede-Münster), 6th September [drones for emergency services]

GERMANY, City-State of Hamburg, 7th June [drones for medical deliveries]

BELGIUM, City of Antwerp, 10th September [drones for public security]

BELGIUM, City of Ghent, 21st June [drones for medical assistance]

GERMANY, Northern Hesse Region (incl. Bad Hersfeld), 28th September [drones for logistics]

BELGIUM, City of Brussels, 16th July [drones for medical assistance]

GERMANY, City of Ingolstadt and its region (State of Bavaria), 19th June [Drones for medical assistance and taxi]

FRANCE, Region Nouvelle Aquitaine (incl. Bordeaux Metropole), 20th September [drones for smart tourism]

FRANCE, Toulouse Metropole, 19th September [drones for environmental monitoring]

SWITZERLAND, Canton of Geneva, 30th May [drones for ambulance and taxi]

BULGARIA, City of Plovdiv, 27th June [drones for logistics]

UIC²
UAM **I**nitiative
Cities **C**ommunity

The 2018-19 FrontRunner & Fellow Cities / Regions

Smart Mobility in Smart Cities: WALK.RIDE.DRIVE.FLY
ERRIN, Transport Working Group, 11 Apr 2019, Brussels

Contact: vassilis.agouridas@airbus.com

Key steps and evolution of membership & status

Key Output: Manifestos of Intent ☑

Key Output: If GO - Memorandums of Understanding ⧖

Key Output: EIP-UAM Initiative Demonstrators

Key Output: Dissemination & Documentation

EU Network of U-Space Demonstrators

Manifesto of Intent

FrontRunners

Ongoing work

Demonstration Project Proposal

MoU

UAM Pioneers

Fellows

Statement of Intent

EIP-SCC
European Innovation Partnership on Smart Cities and Communities

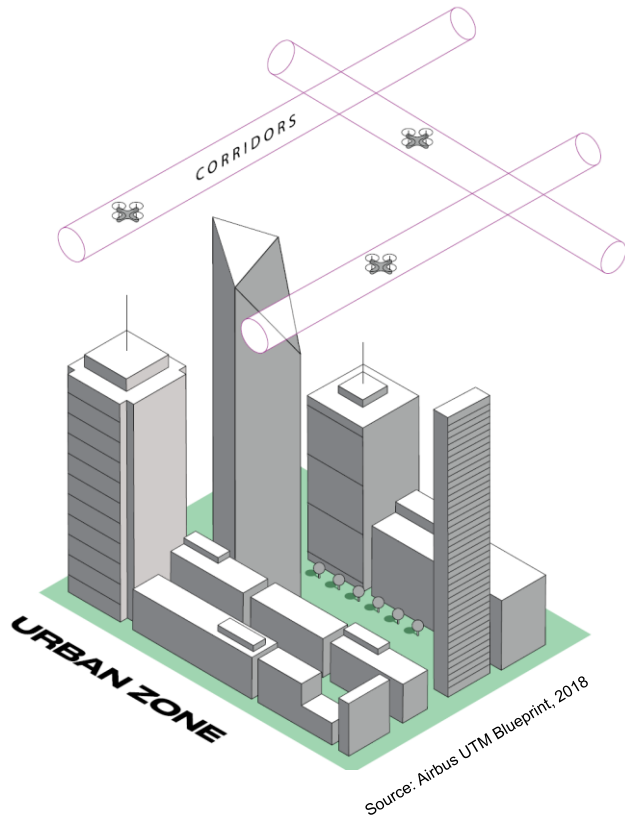*Contact: vassilis.agouridas@airbus.com*

Cities and a wide spectrum of stakeholders

- ✓ Cities **own/orchestrate and regulate** transportation infrastructure

- ✓ Cities **own and control** traffic and transport data

- ✓ Smart cities have the **digital infrastructure backbone** for managing and sharing real-time traffic and transport data

WALK. RIDE. DRIVE. FLY.

Source: http://www.rinnovabili.it

Cities are more than customers and users of UAM solutions; they are partners

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

Urban traffic goes to the third dimension!
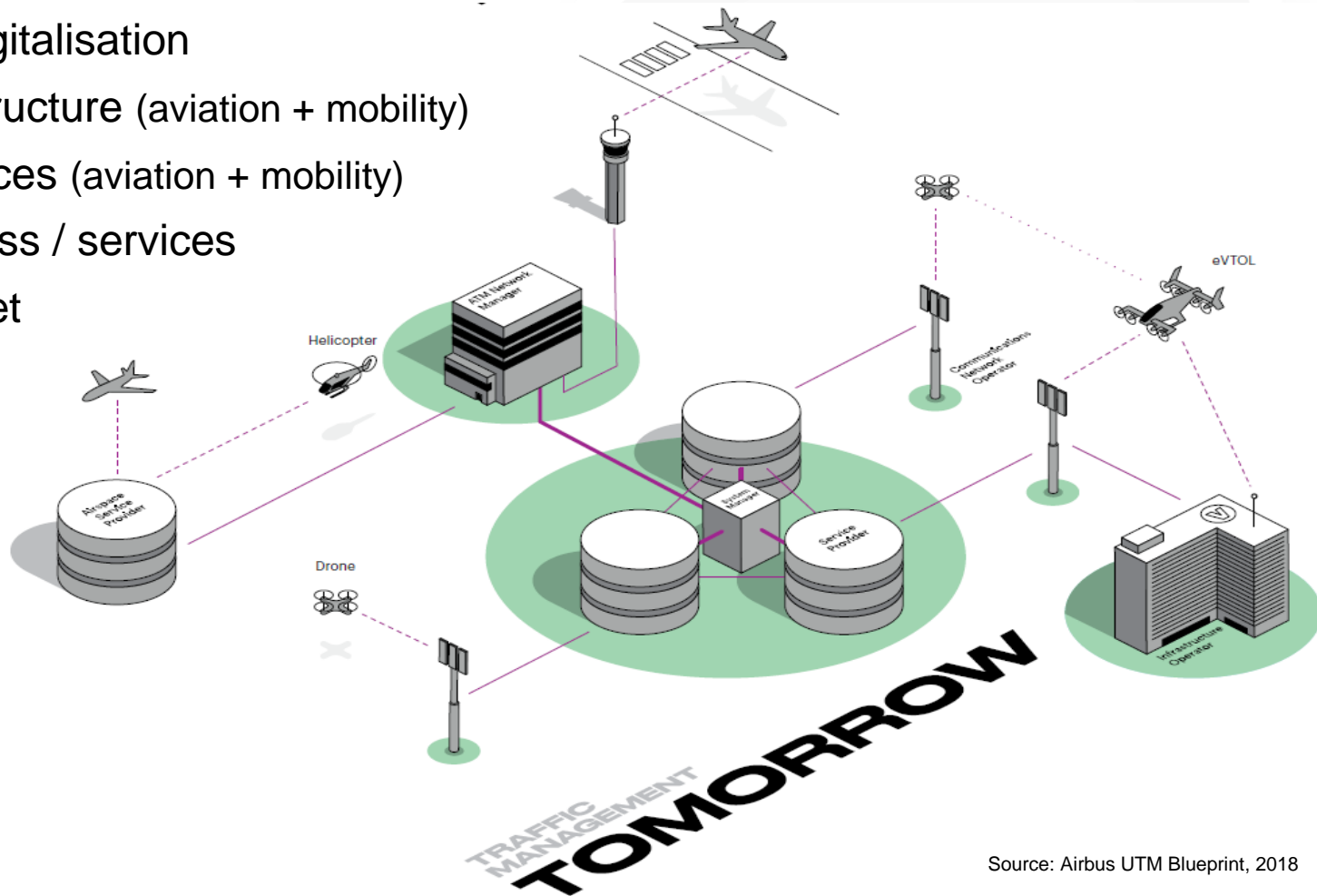

Source: Airbus UTM Blueprint, 2018

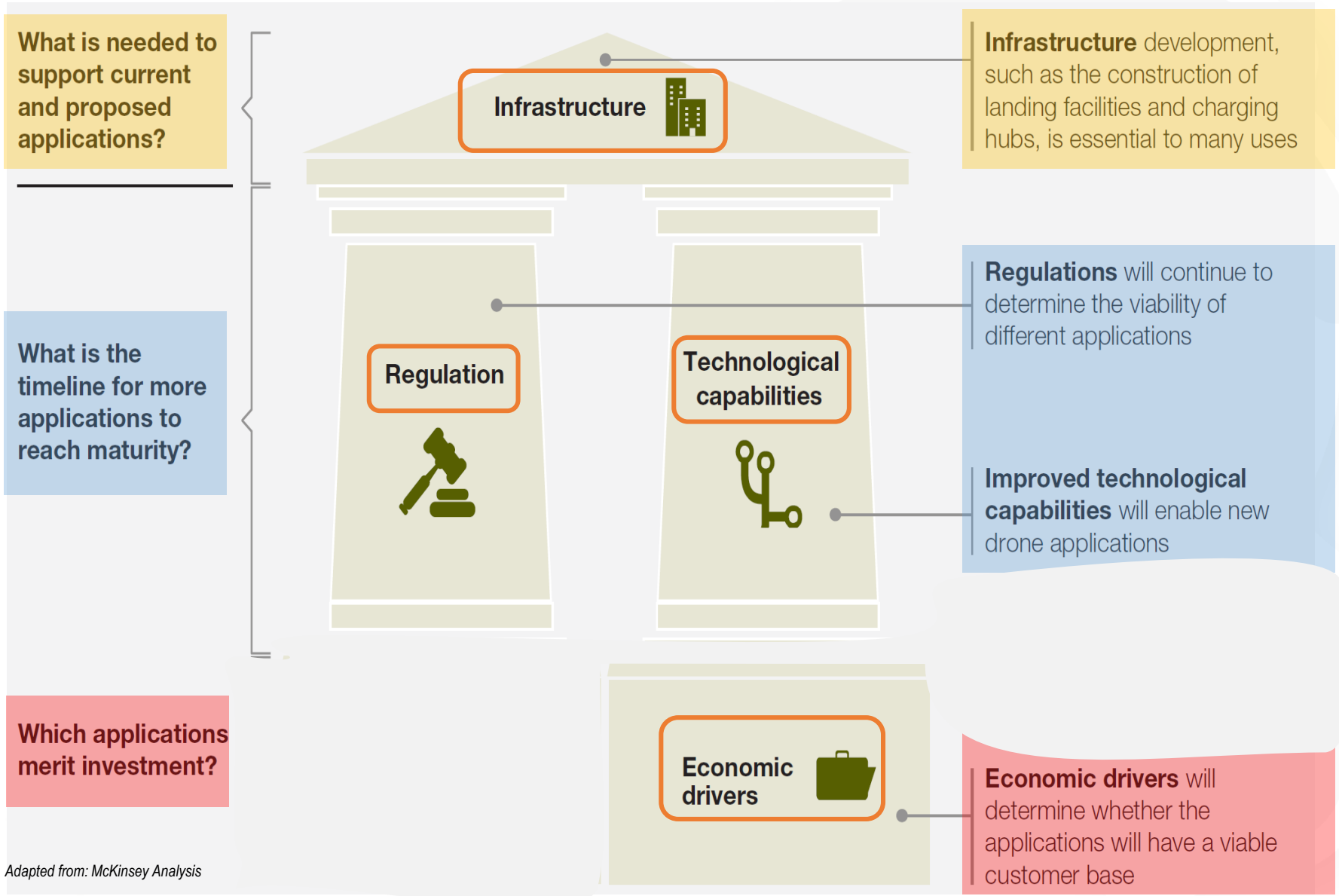**'Urban' implies more than increased levels of safety and security**

Urban air traffic management sets a new 'status quo'

- ✓ Airspace digitalisation
- ✓ New infrastructure (aviation + mobility)
- ✓ New interfaces (aviation + mobility)
- ✓ New business / services
- ✓ New mindset


Source: Airbus UTM Blueprint, 2018

Five factors influence drone services growth

What is needed to support current and proposed applications?

What is the timeline for more applications to reach maturity?

Which applications merit investment?

Infrastructure

Regulation

Technological capabilities

Economic drivers

Infrastructure development, such as the construction of landing facilities and charging hubs, is essential to many uses

Regulations will continue to determine the viability of different applications

Improved technological capabilities will enable new drone applications

Economic drivers will determine whether the applications will have a viable customer base

Adapted from: McKinsey Analysis

Illustration of the urban mobility ecosystem

Urban air traffic is only fractional when compared to the total urban traffic footprint ….
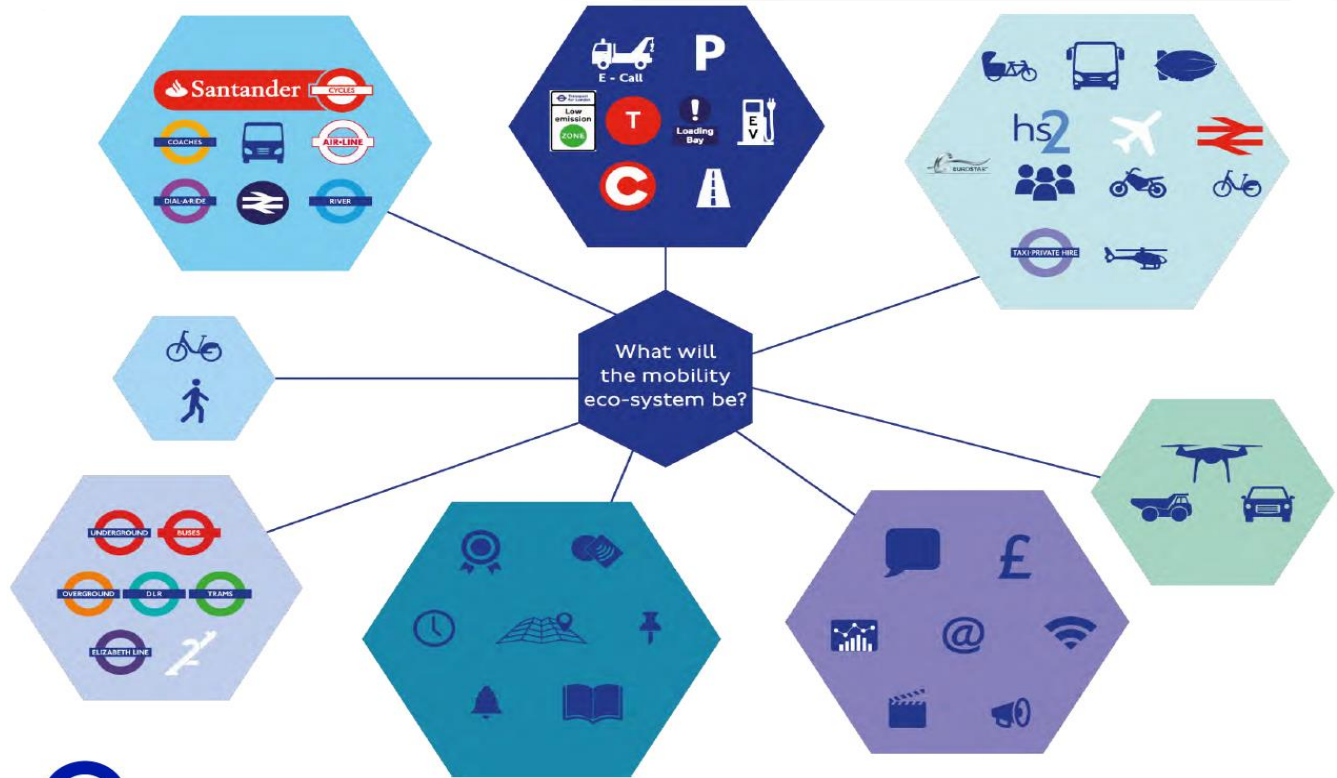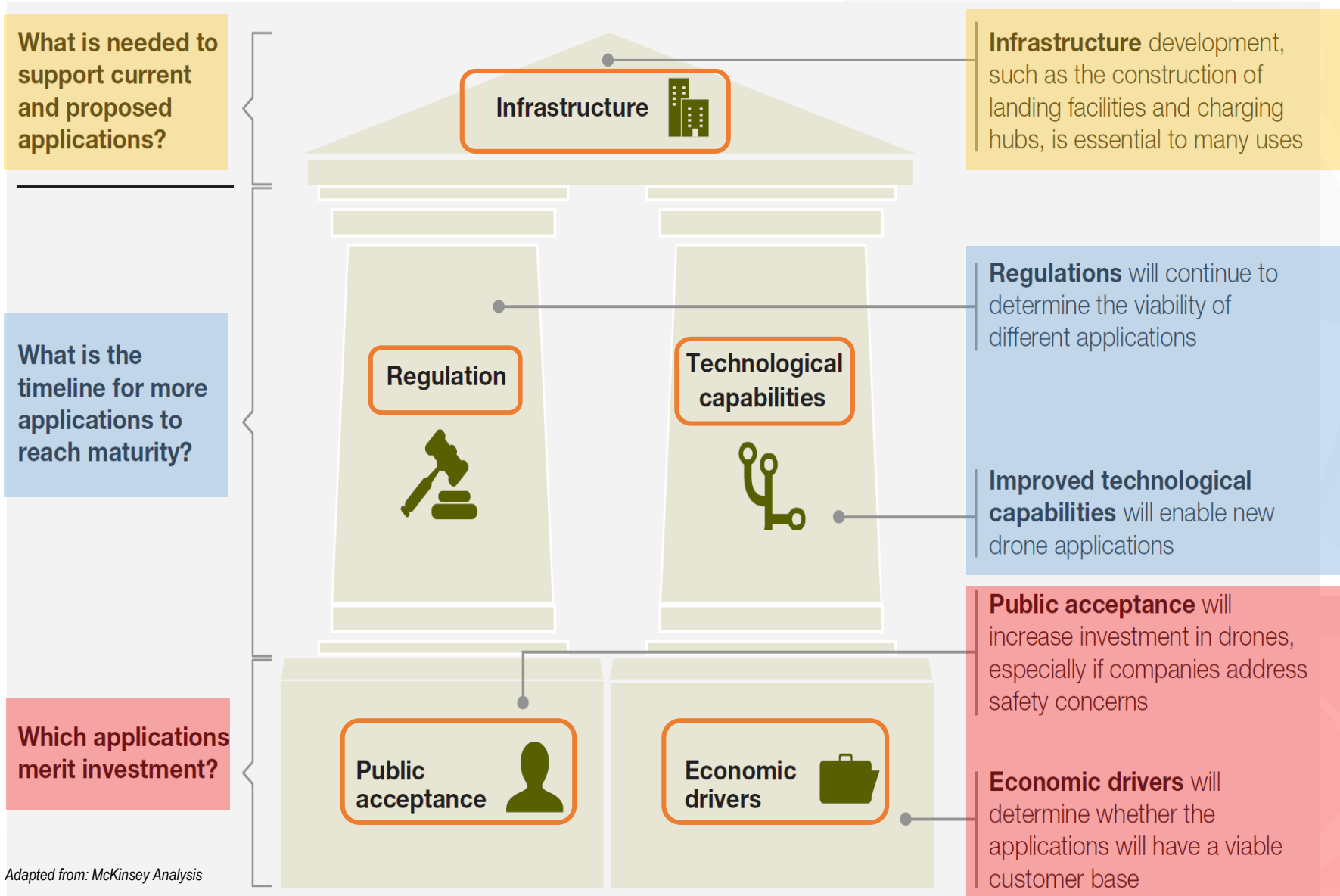

Source: TfL, Transport for London

EVERY JOURNEY MATTERS

…nevertheless,

'co-existence' is a prerequisite

Five factors influence drone services growth

What is needed to support current and proposed applications?

Infrastructure

Infrastructure development, such as the construction of landing facilities and charging hubs, is essential to many uses

What is the timeline for more applications to reach maturity?

Regulation

Technological capabilities

Regulations will continue to determine the viability of different applications

Improved technological capabilities will enable new drone applications

Which applications merit investment?

Public acceptance

Economic drivers

Public acceptance will increase investment in drones, especially if companies address safety concerns

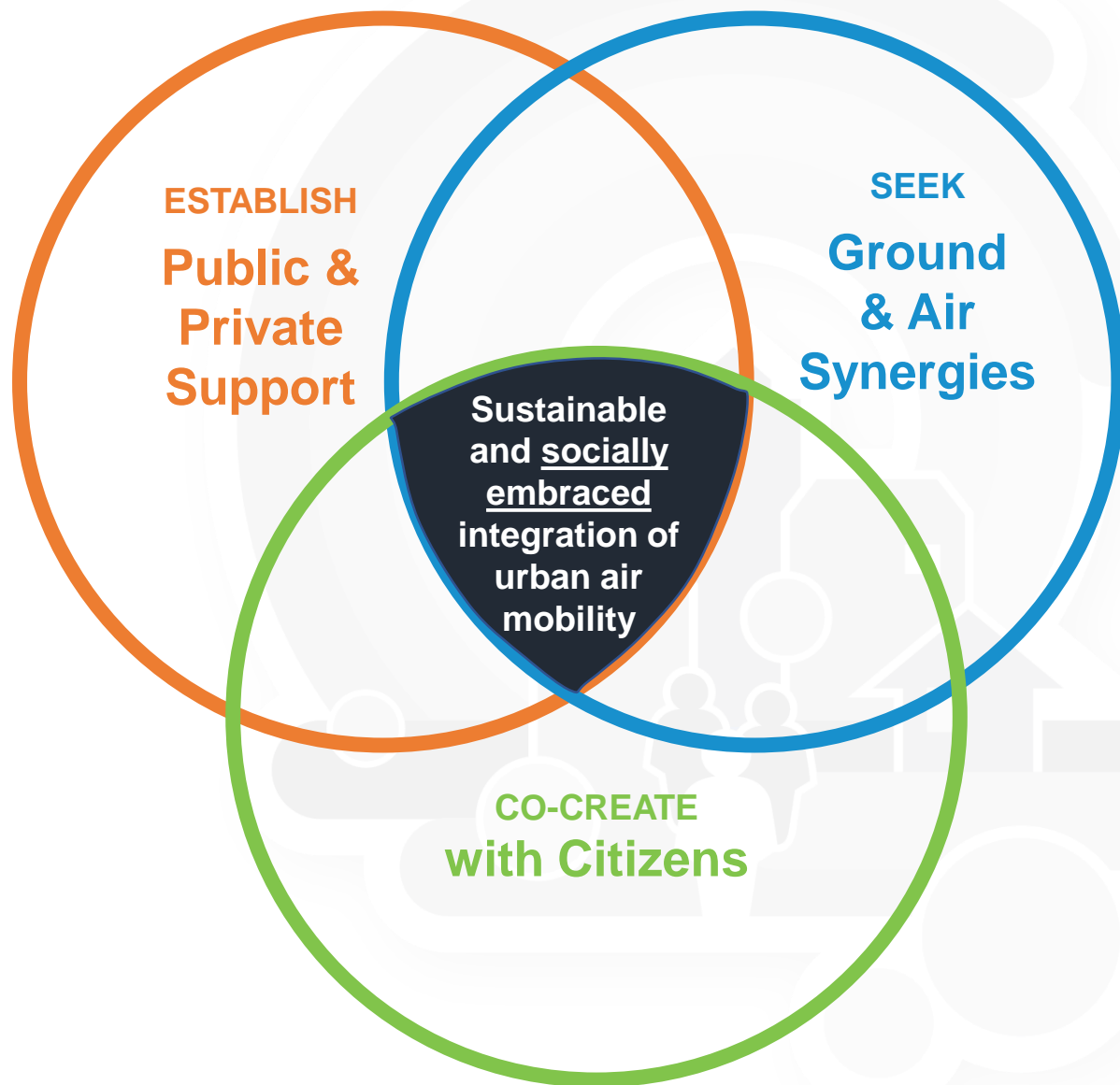**Economic drivers** will determine whether the applications will have a viable customer base

Adapted from: McKinsey Analysis

A three-fold approach is required for integrating air-vehicles / drones in urban environments

Reminder

- ✓ **integrated sustainable urban mobility** solutions
  (e.g. ground + air)

- ✓ **demonstrable benefits** to citizens
  (e.g. reliable & valuable services)

- ✓ **socially & environmentally acceptable** solutions
  (e.g. safety, security, noise)

ESTABLISH
Public & Private Support

SEEK
Ground & Air Synergies

Sustainable and socially embraced integration of urban air mobility

CO-CREATE
with Citizens

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

ABC NEWS

⌂   Just In   Politics   World   Business   Sport   Science   Health   Arts   Analysis   Fact Ch

🖨 Print   ✉ Email   f Facebook   🐦 Twitter   🔗 More

Google's drone delivery trial could be under threat from group of angry Australian residents

By Jake Evans
Updated Sat at 12:02am

PHOTO: A drone flies overhead as part of a drone fast food delivery trial in Canberra. (ABC News: Jake Eva

When a corporation sets its mind to introducing a disruptive technology, it can seem like the unstoppable march of progress — whether society wants it or not.

RELATED STORY: Noise from drone c
Canberra residents

RELATED STORY: Fancy having som
drone? Here's how it works

Futurism

Residents Are Furious About Google's Drone Delivery Service

Published by Jon Christian in Advanced Transport

Project Wing

Google parent company Alphabet is gearing up to launch what the *Australian Broadcasting Corporation* reports will be the world's first commercial drone delivery service, which will fall under its Project Wing arm.

Roger Clarke, Professor at the Australian National University warns visible

disruption would be **"beaten down" by public opinion**

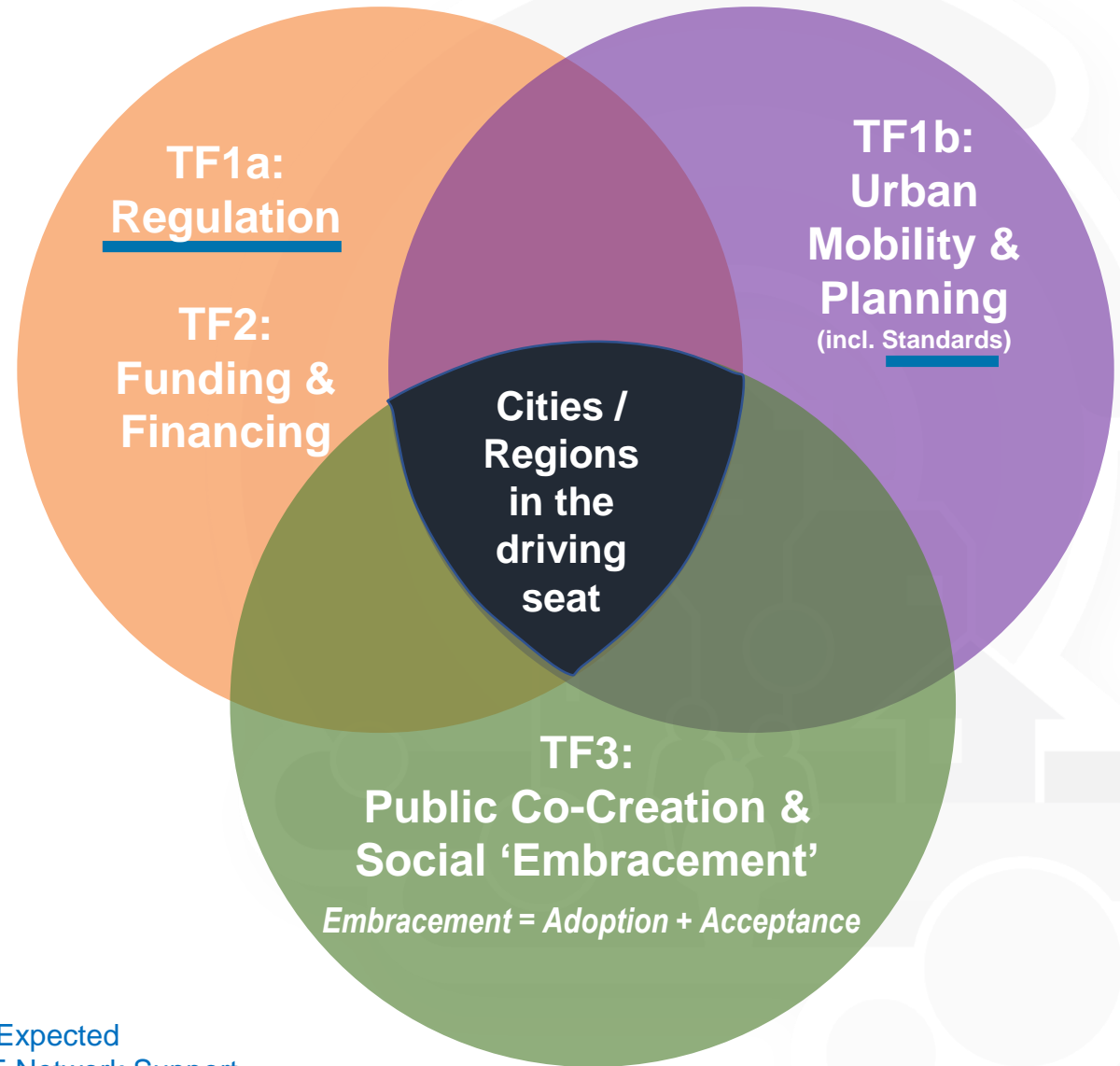if corporations did not bring the public along:

'That is what is going to happen with some forms of these new

robotics technologies unless corporations deal the public in, and get

the downsides understood and prevented or mitigated,

and they're not doing it'

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

✓ Reflecting the three-fold approach

✓ Led by the Cities/Regions

✓ Supported by Experts & UAM Initiative Ambassadors

TF1a: Regulation

TF1b: Urban Mobility & Planning
(incl. Standards)

TF2: Funding & Financing

Cities / Regions in the driving seat

TF3: Public Co-Creation & Social 'Embracement'
Embracement = Adoption + Acceptance

Expected U-SPACE Network Support

What will / should be the role of cities?

Defining offering — Vision ✓

Operation — Running the platform ✗

Data management — Handling data & insights ✓

Development and provider integration — Realizing platform ✗

Regulatory framework — Governing platform operation ✓
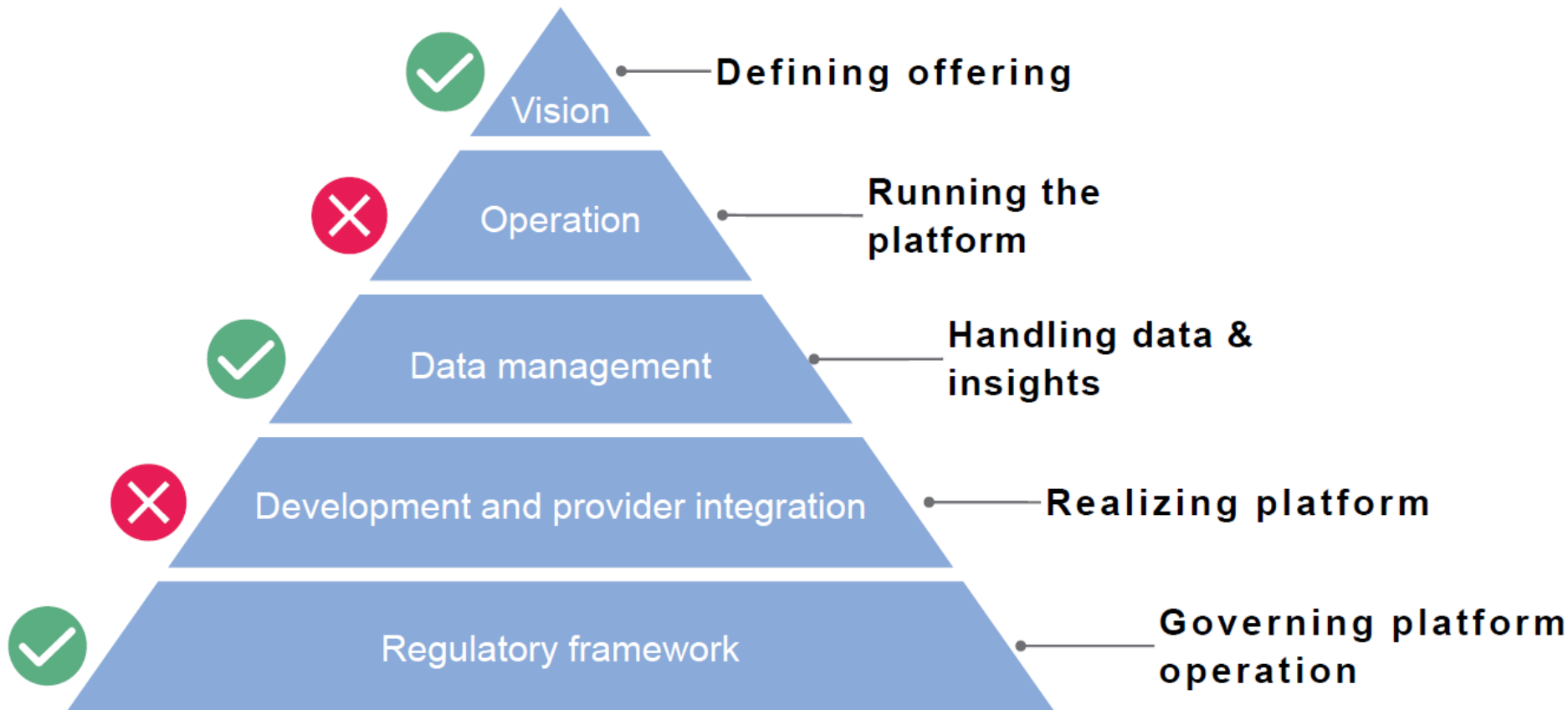
Source; World Economic Forum; BCG Analysis

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

Setting vision, handling data and the regulatory framework?

It is all about a <u>Social</u> Business Ecosystem

Thank you!

TF1a: Regulation

TF2: Funding & Financing
Lead: Ingolstadt
Co-lead: Geneva

TF1b: Urban Mobility & Planning
(incl. Standards)

Cities / Regions in the driving seat

TF3: Public Co-Creation & Social 'Embracement'
Embracement = Adoption + Acceptance
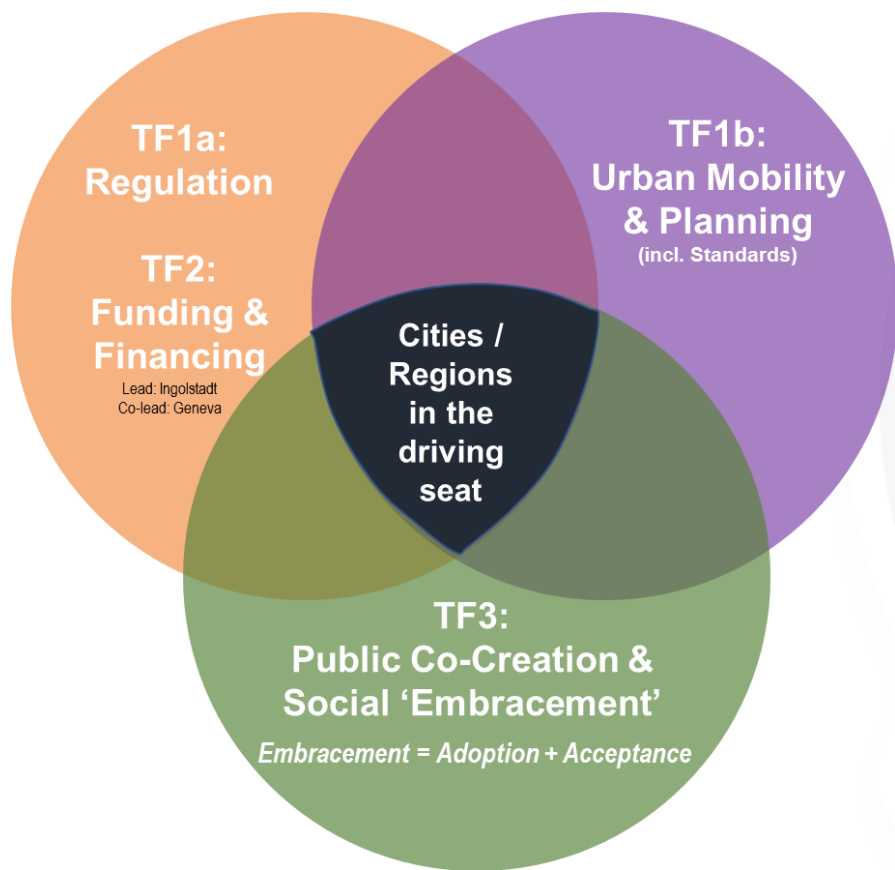
UIC² serves as a <u>city-centric</u> platform to:

✓ Ensure a holistic approach to urban mobility

✓ Proactively engage with citizens

✓ Co-create with public and private actors (incl. citizens)

EIP-SCC
European Innovation Partnership on Smart Cities and Communities

Smart Mobility in Smart Cities: **WALK. RIDE. DRIVE. FLY.**

Thank you
Any questions?

Dr Vassilis AGOURIDAS

UAM Initiative Leader, AIRBUS

vassilis.agouridas@airbus.com

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

Ministerie van Infrastructuur
en Waterstaat

EASA
European Aviation Safety Agency

The increased engagement of cities and local communities in the Urban Air Mobility initiative of the European Innovation Partnership (EIP-SCSC)

DRONES AMSTERDAM DECLARATION
Amsterdam - 28 November 2018

The conference welcomed:

- the widespread efforts made since the High Level Drone Conference in Helsinki to open the drone services market in line with the Aviation Strategy for Europe adopted in 2015.
- the creation of a new field of competences regarding unmanned aircraft regardless of mass at the European Union level as established by the new Basic Regulation[1].
- the effort performed by the European Union Aviation Safety Agency (EASA) and the Commission with extensive support from Member States and stakeholders to translate the new risk-based approach into detailed rules concerning drone operations;
- the funding of the first U-space projects by the SESAR Joint Undertaking;
- the increased engagement of cities and local communities in the Urban Air Mobility Initiative of the European Innovation Partnership (EIP-SCC).
- the successful creation by the Commission with the support of EUROCONTROL, EASA and the SESAR Joint Undertaking of the European U-space Demonstrator Network, connecting various U-space and urban air mobility projects.

1. Push towards integrated smart mobility and fair access to all dimensions of public space

Recognised the societal need and imperative to move towards smarter, safer and greener mobility on the ground and in the air to improve the quality of life.

Noted the emergence of new technological and business models featuring, for example, flying cars or drones flying at very low levels that impose a rethink of the boundaries and interfaces of urban and public space as they are expanding to the 3rd dimension.

Called upon urban transport actors, policy makers and associations to pioneer cases demonstrating which systems, solutions and services seamlessly integrate smart multimodal solutions.

Invited cities and regions, also within the Smart Cities initiative, to co-create with the citizens the public conditions and the infrastructure for integrated air and ground smart mobility solutions to flourish, where new and clean technologies, big data, real-time information and corresponding business models converge towards the enablement and realisation of "mobility as a service".

EIP-SCC
European Innovation Partnership
on Smart Cities and Communities

4. Focus on local needs and initiatives

Welcomed the first U-space demonstrations that have already taken place under the umbrella of the European U-space Demonstrator Network.

Called for all relevant projects to join this Network to share knowledge and to give feedback, based on their practical expertise of demonstrators, as the regulatory framework and standards are developed.

Recalled that such demonstrators should cover all aspects of drone operations and be developed in close collaboration with local authorities, including in the context of the European Innovation Partnership - Smart Cities & Communities projects.

Recalled that public trust is crucial for developing the EU drone services market and that effective testing and deployment in "real-life" locations and scenarios should take account of societal expectations.

EIP-SCC
European Innovation Partnership on Smart Cities and Communities

6. Conclusions

The conference recognised the good progress made in establishing a common European drone services market. The European institutions and industry are urged to continue their work.

In particular, the conference urges that priority be given to:

1. Providing support to Member States in the implementation of the European drone regulations;

2. Developing, in close cooperation with Member States and all stakeholders, an institutional framework for a competitive U-space services market and how drones need to be operated in the Single European Sky;

3. Developing European product standards for drones and of other standards to meet the European performance requirements taking into account the global dimension;

4. Supporting cities in their efforts to provide a fertile ground for innovative multimodal solutions integrating the 3rd dimension into their urban planning processes;

5. Developing communication and promotion material for information campaigns to all drone users and other actors involved in drone operations such as local authorities;

6. Further enhancing the European U-space Demonstrator Network to speed up the opening of the drone services network;

7. Investing in the necessary research and development activities that are a key enabler for the growth of safe, secure and green drone operations in Europe.