BBC Research & Development

CAMBRIDGE WIRELESS

5G in Content Creation

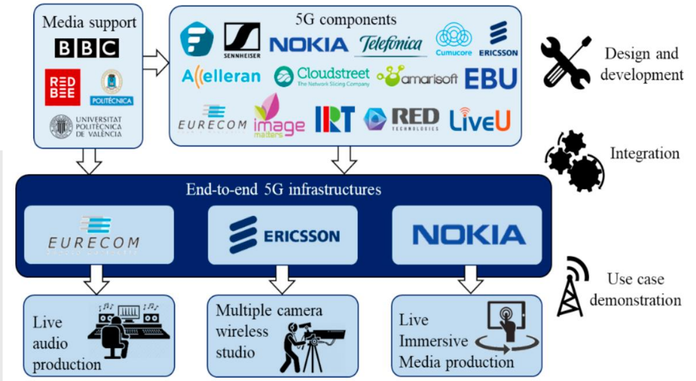
Ian Wagdin

Dec 2020

EBU

Challenges in Accelerator Media Innovation Programme for 2020

UK 5G



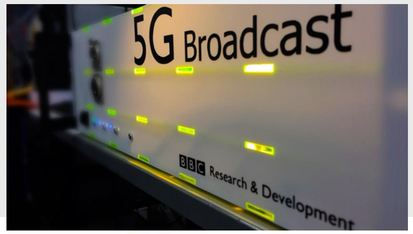
3GPP
A GLOBAL INITIATIVE

ETSI
World Class Standards

5G NR
5G New *Thinking*

5G MAG
MEDIA ACTION GROUP

5GXCAST



5G PPP

5G RuralFirst

ITU

5G IN CONTENT PRODUCTION

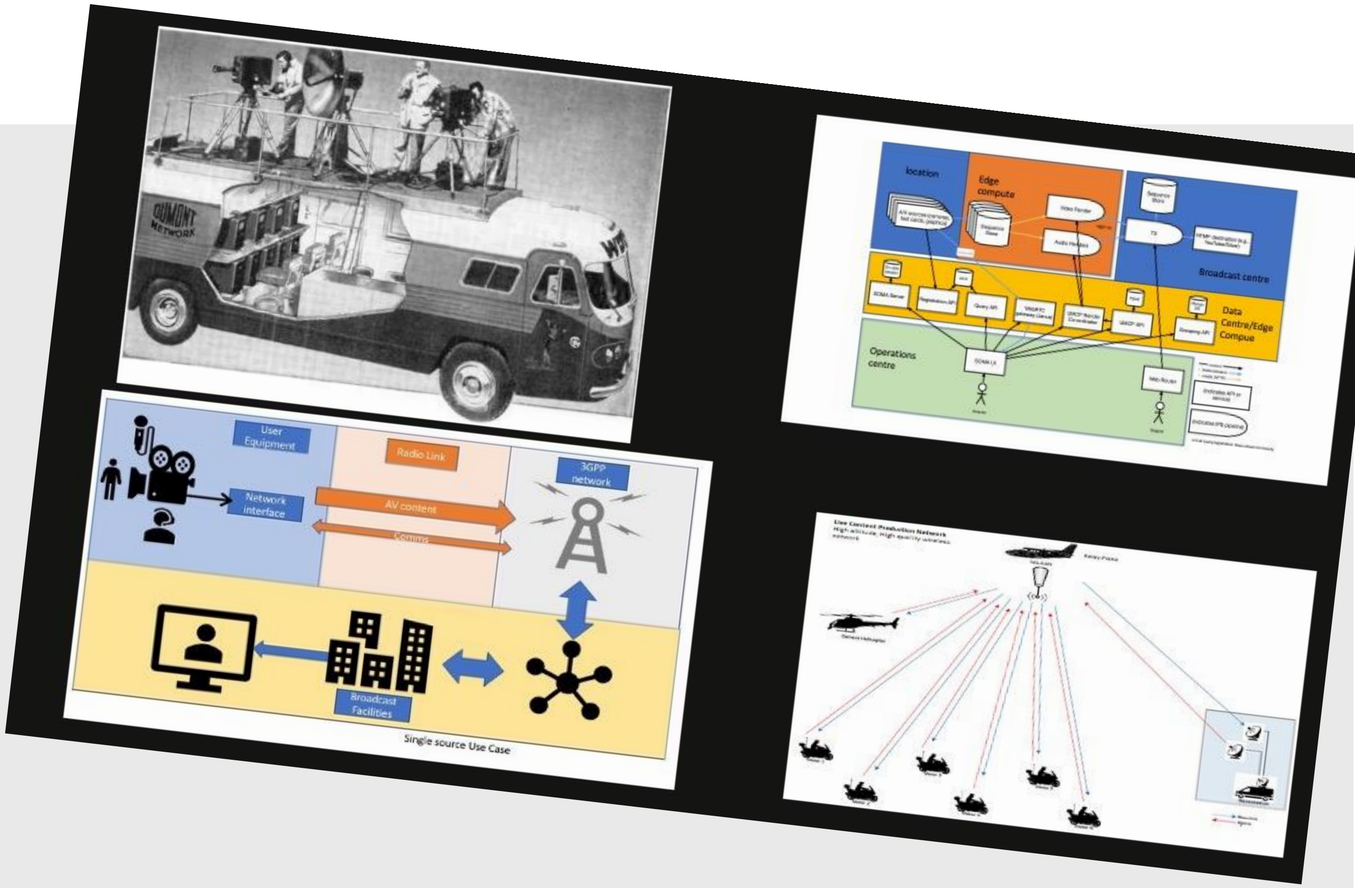
Use Cases

- Single Source Contribution, News and lower tier sport.
- **Remote Production,** multicamera, timing, control and monitoring.
- Immersive, free viewpoint video.
- **Radio cams,** Tier 1events, wide area events.

5G IN CONTENT PRODUCTION

Use Cases

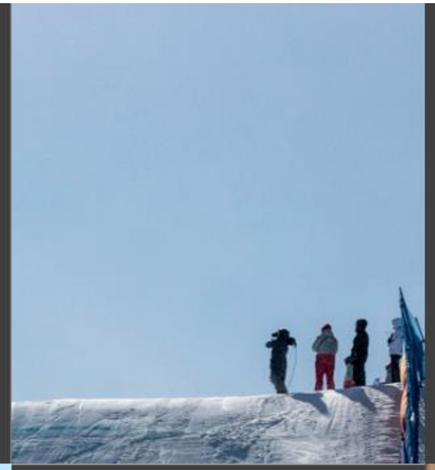
- Reliable, QoS as good or better than now.
- **Latency,** fixed is better than low.
- Bandwidth, uplink is critical.
- **Timing,** synchronization and timestamps.
- **Onboarding**, NPN, Slices etc.
- **Network Agnostic,** Workflow is key



#1 FWA

Beauty Camera

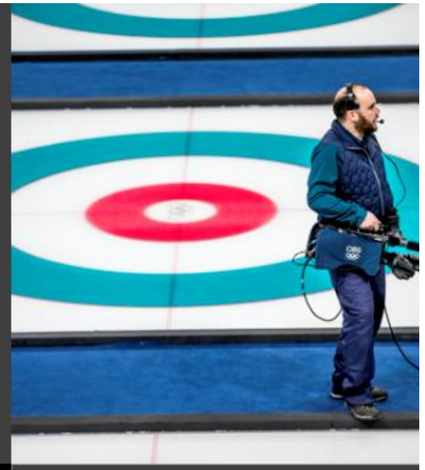
IBC
No Mobility
UL Throughput
Public Areas/City



#3 Outdoor

Cross-country

Mobility
Outdoor
Field of Play Coverage
Compound



#2 Outdoor

Alpine

Limited Mobility
Outdoor
Field of Play Coverage
Compound

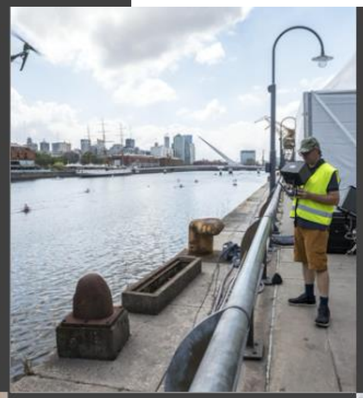
#4 Indoor

Curling

#5 VR

VR CAMERA

IBC
Limited Mobility
UL Throughput
Field of Play coverage
IBC/Compound



#7 ENG

Near Live ENG

Venues
Mobility
UL Throughput
Back of House coverage
5G *Consumer-type* SLA

#6 Drones

Mobility
Latency
UL Throughput
Field of Play Coverage

Other Use Cases

5G IN CONTENT PRODUCTION

5G overview

Mobility

Flexibility

Reliability

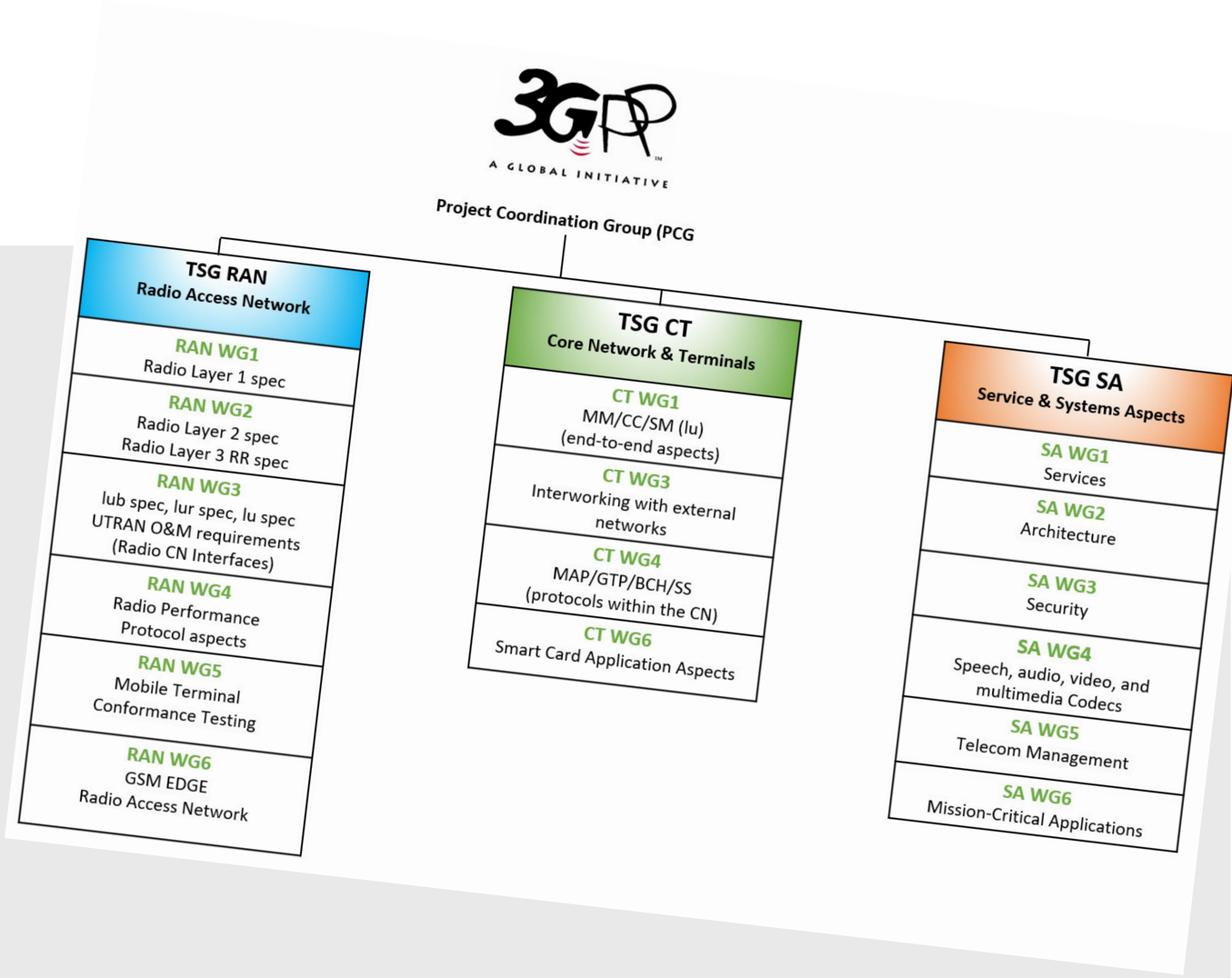
5G IN CONTENT PRODUCTION

3GPP

5G IN CONTENT PRODUCTION

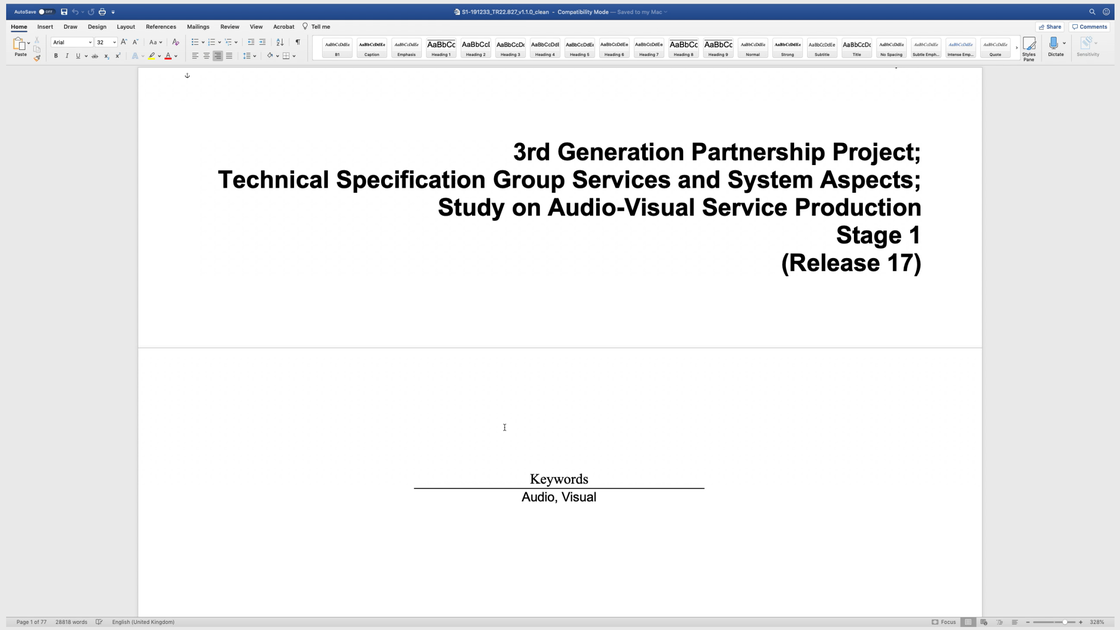
3GPP

- **RAN**, Radio Access Network.
- **CT,** Core Network and Terminals.
- **SA**, Service architecture.
- **SA1,** takes use cases and produces requirements.



5G IN CONTENT PRODUCTION

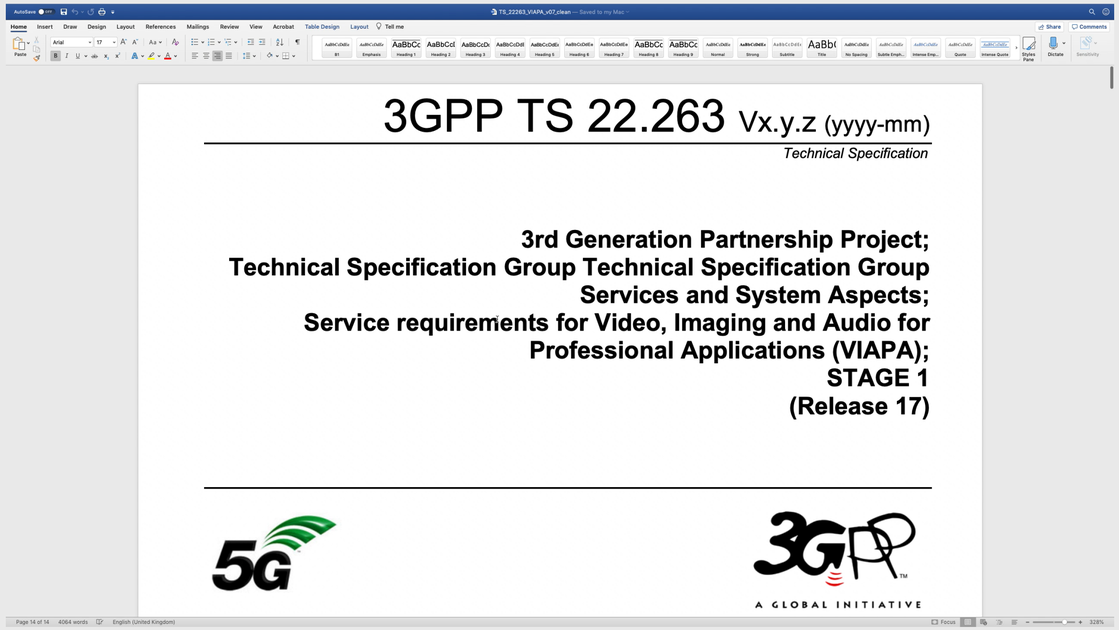
3GPP



3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Study on Audio-Visual Service Production
Stage 1
(Release 17)

Keywords
Audio, Visual

Study on Audio-Visual Production



3GPP TS 22.263 Vx.y.z (yyyy-mm)
Technical Specification

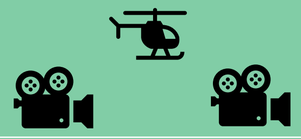
3rd Generation Partnership Project;
Technical Specification Group Technical Specification Group Services and System Aspects;
Service requirements for Video, Imaging and Audio for Professional Applications (VIAPA);
STAGE 1
(Release 17)

A GLOBAL INITIATIVE

Specifications for Video, Imaging and Audio for Professional Applications

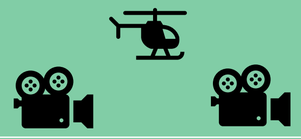
5G IN CONTENT PRODUCTION

3GPP

	Crawl	Walk	Run
			

5G IN CONTENT PRODUCTION

3GPP

	Crawl	Walk	Run
			
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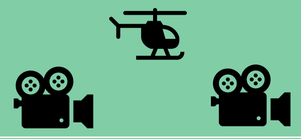
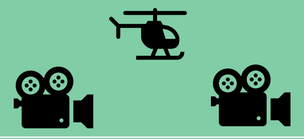
5G IN CONTENT PRODUCTION

3GPP

	Crawl	Walk	Run
			
	✓	✗	✗
	✓	✓	✗

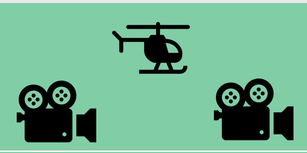
5G IN CONTENT PRODUCTION

3GPP

	Crawl	Walk	Run
	✗	✗	✗
	✗	✗	✗
	✓	✗	✗
	✓	✗	✗
	✓	✓	✗

5G IN CONTENT PRODUCTION

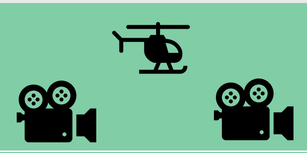
3GPP

	Crawl	Walk	Run
	✗	✗	✗
	✗	✗	✗
	✗	✗	✗
	✓	✗	✗
	✓	✓	✗

Release 15

5G IN CONTENT PRODUCTION

3GPP

	Crawl	Walk	Run
	✗	✗	✗
	✗	✗	✗
	✗	✗	✗
	✓	✗	✗
	✓	✓	✗

Release 17

Release 15

5G IN CONTENT PRODUCTION

3GPP

	Crawl	Walk	Run
	✗	✗	✗
	✗	✗	✗
	✗	✗	✗
	✓	✗	✗
	✓	✓	✗

Release 18?

Release 17

Release 15

5G IN CONTENT PRODUCTION

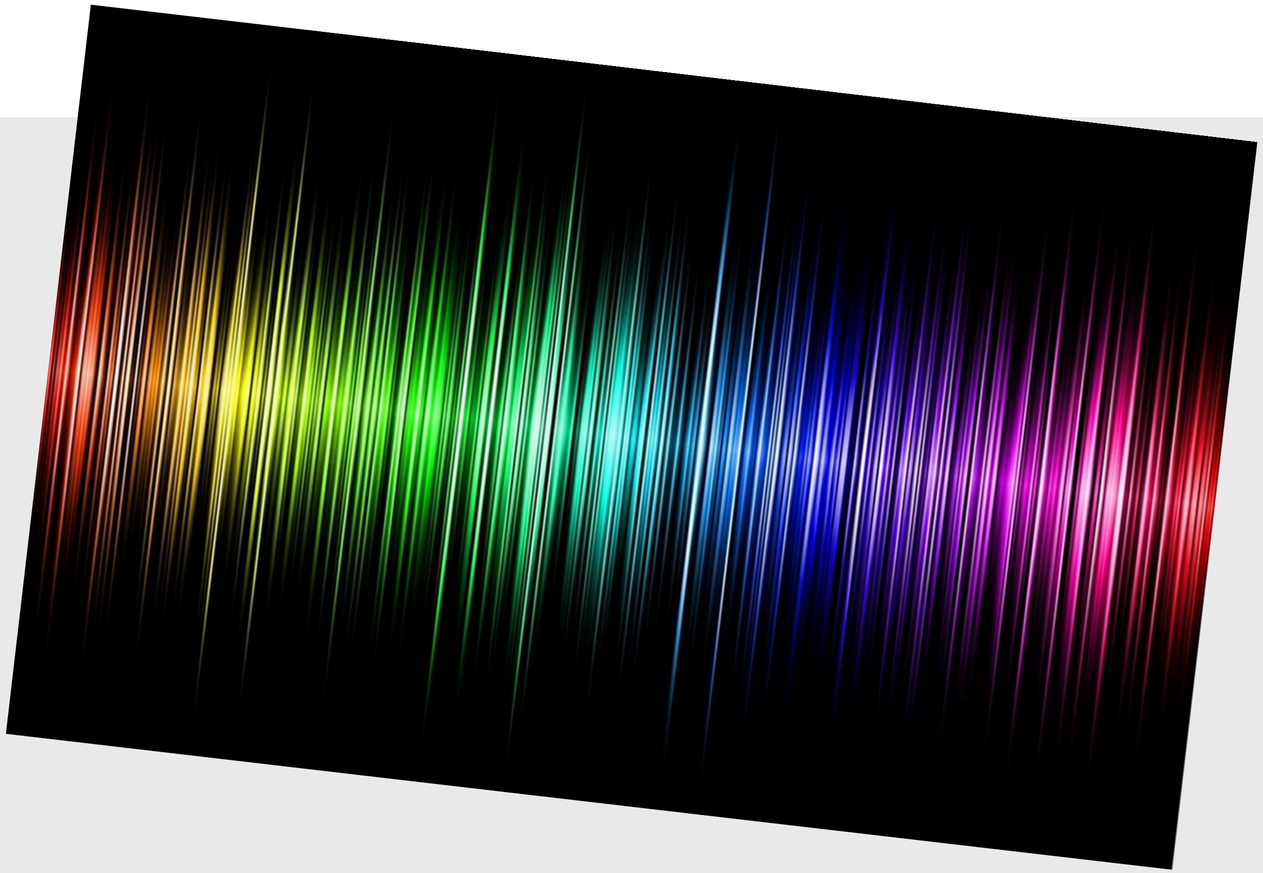
3GPP

	Crawl	Walk	Run
	✗	Release 18	✗
	✗		✗
	✗	Release 17	✗
	✓		✗
	✓	Release 15	✗

5G IN CONTENT PRODUCTION

Lets talk spectrum

- **Experience**, we have been dealing with it for 100 years -unusual as a vertical.
- **mmWave,** good for high bandwidth. USA focus.
- **Mid-band**, General purpose, EU activity.
- **Regulation**, permanent v ad-hoc models.



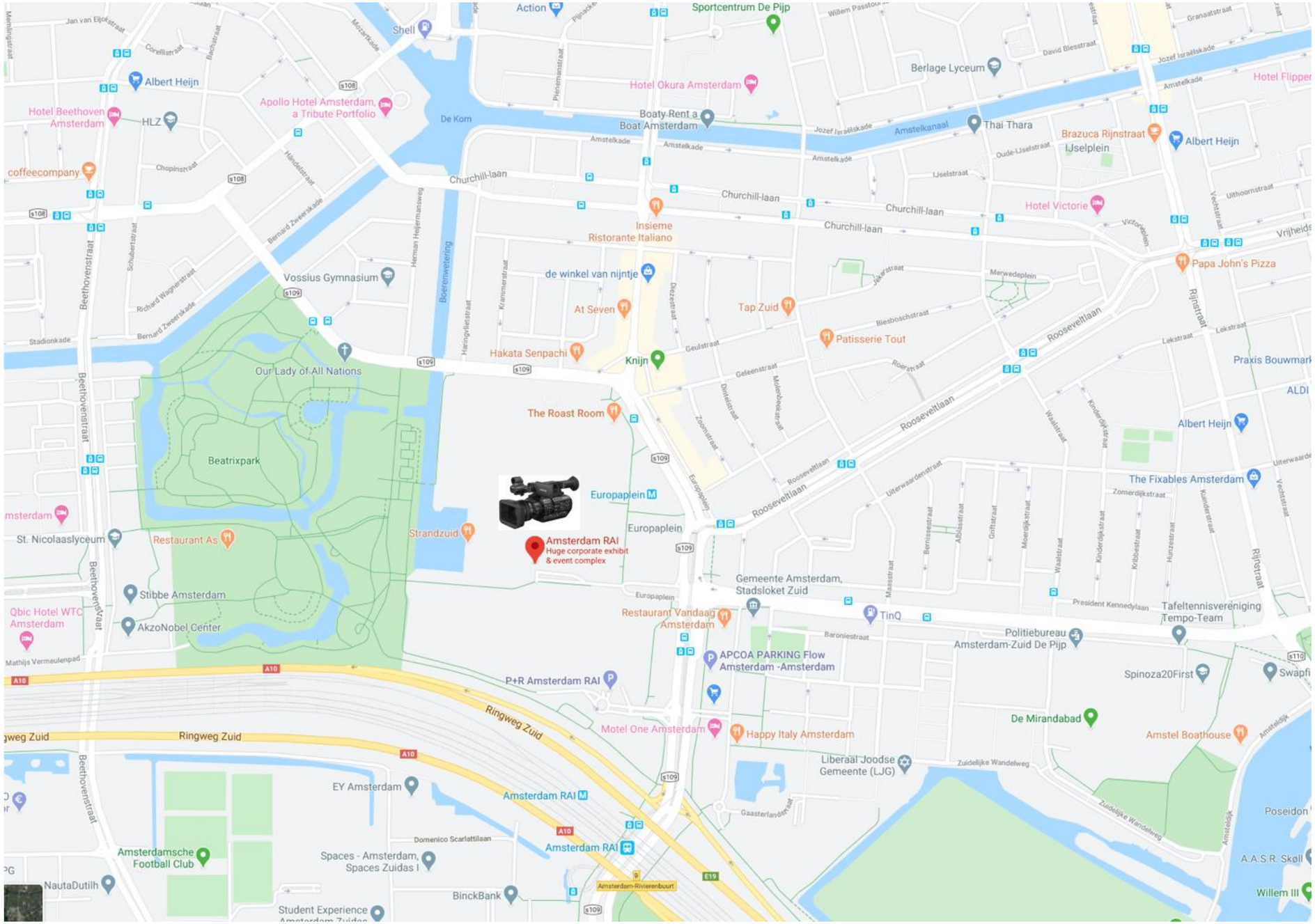
FIND OUT MORE

5G Remote Production

To design and evaluate an early stage PoC for 5G Remote Production capabilities, particularly multi-camera synchronisation utilising 5G private networks (5G in a box solutions).

Accelerator Champions: BBC (Project Lead, Ian Wagdin), Al Jazeera Media Networks, BT, ITV, SVT, TV2, ViacomCBS, Yle, Olympic Broadcast Services, EBU

Participants: Mobile Viewpoint, Huawei, Aviwest, Sony, LiveU, NewTek



RAI – EuropaPlein

RAI Convention Centre (EuropaPlein)

RAI

vodafone Ziggo

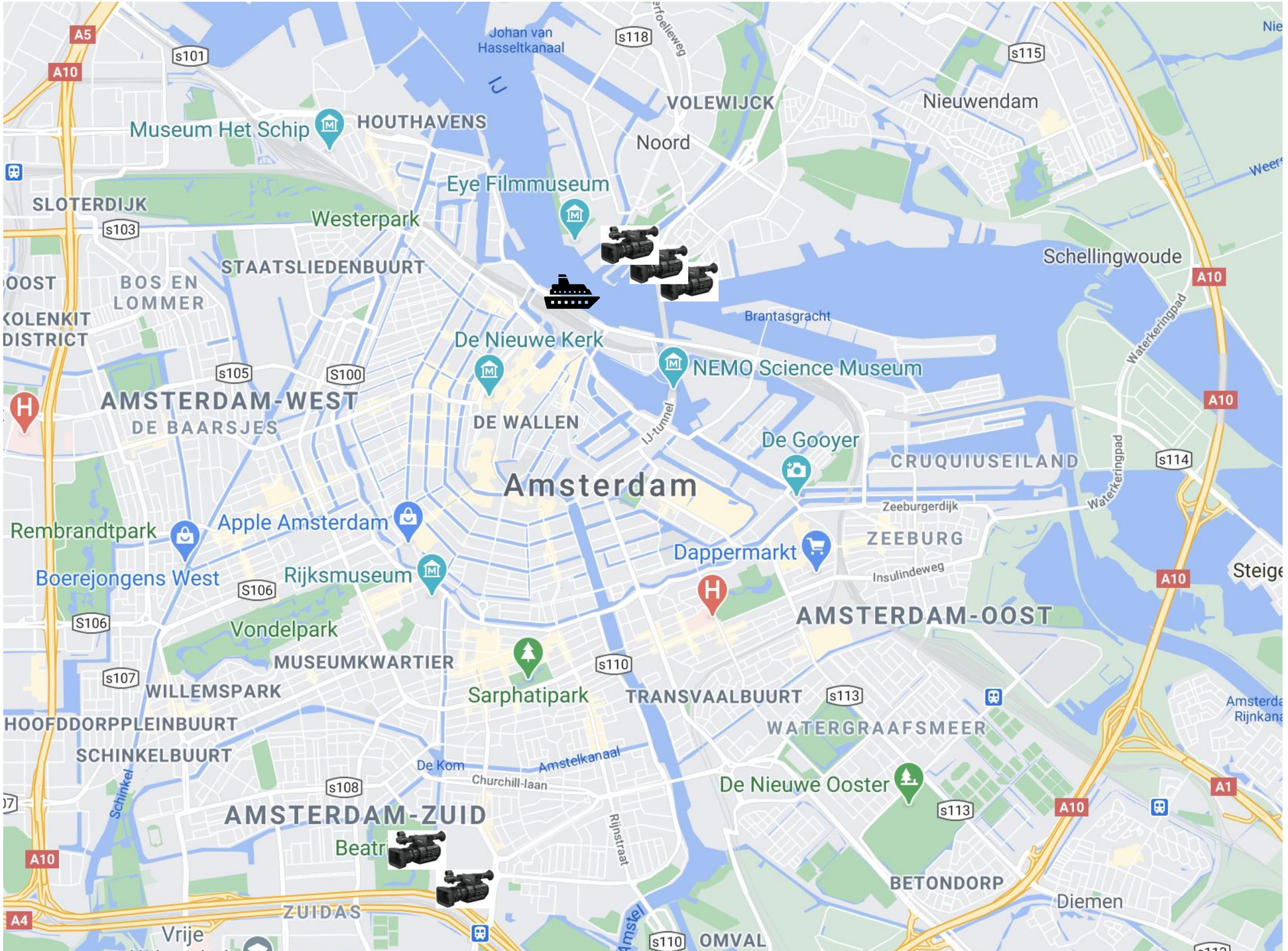
LiveU Server

Tricaster Elite 2

LiveU LU800

Sony FX9 and Z280 cameras

ViacomCBS London


Johan van Hasseltkanaal
VOLEWIJCK
Noord
Nieuwendam
Museum Het Schip
HOUTHAVENS
Eye Filmmuseum
SLOTERDIJK
Westerpark
STAATSLIEDENBUURT
BOS EN LOMMER
Schellingwoude
Brantasgracht
De Nieuwe Kerk
NEMO Science Museum
AMSTERDAM-WEST
DE BAARSJES
DE WALLEN
IJ-tunnel
De Gooyer
CRUQUIUSEILAND
Amsterdam
Zeeburgerdijk
Rembrandtpark
Apple Amsterdam
ZEEBURG
Dappermarkt
Boerejongens West
Rijksmuseum
Insulindeweg
AMSTERDAM-OOST
Vondelpark
MUSEUMKWARTIER
Sarphatipark
WILLEMSPARK
TRANSVAALBUURT
WATERGRAAFSMEER
HOOFDDORPPLEINBUURT
SCHINKELBUURT
De Kom
Amstelkanaal
Churchill-laan
De Nieuwe Ooster
AMSTERDAM-ZUID
Rijnstraat
BETONDORP
Diemen
ZUIDAS
Vrije
OMVAL
Waterkeringpad
A5
A10
A4
A1
s101
s103
s105
S100
S106
s107
s108
s110
s113
s114
s115
s118

ON Shore (ViacomCBS site)

5G Controlled LED lights

Amsterdam

Fibre Connection to Cloud

Sony Virtual Production cloud

NewTek TriCaster 2 Elite

Non-Public Network (Network in a box)

NPN Spectrum 2.3 -2.4GHz Approved by Radio Communications Agency

Sony XDCAM Cameras

ViacomCBS London

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ViacomCBS London

Kapitein Anna

vodafone Ziggo

Network Slice

MVP Agile Airlink

Huawei CPE

Mixed audio for TX

Clean audio for AI

5G Controlled LED lights

AVIWest AIR 320 5G encoder

Mobile Viewpoint AI Engine

MTV Push Talent – Emma Heesters
Performer on Boat

MVP Xcam

Overview

5G Controlled LED lights

MVP Agile Airlink

MVP Xcam

Boat

vodafone Ziggo

vodafone Ziggo

Drone

AVIWest Air320 5G H265encoder

vodafone Ziggo

Local PTZ

London

NewTek Tricaster 2 Elite

SONY

Sony XDCAM Cameras

5G Controlled LED lights

ViacomCBS Shore Side

vodafone Ziggo

Luminaire
Lighting control

5G Controlled LED lights

LiveULU800

RAI

EE PLMN

Sony Xperia 5G
IBC Office in London

Overview

Slice

5G Controlled LED lights

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3rd Party

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