

# Technical Issues of UHD Broadcasting Service in KOREA



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**ABU Technical Committee Meeting**

24 NOV 2020

Haeng un Jung

Head of Transmission Planning Department

Korean Broadcasting System

**KBSUHD**  
Ultra High Definition

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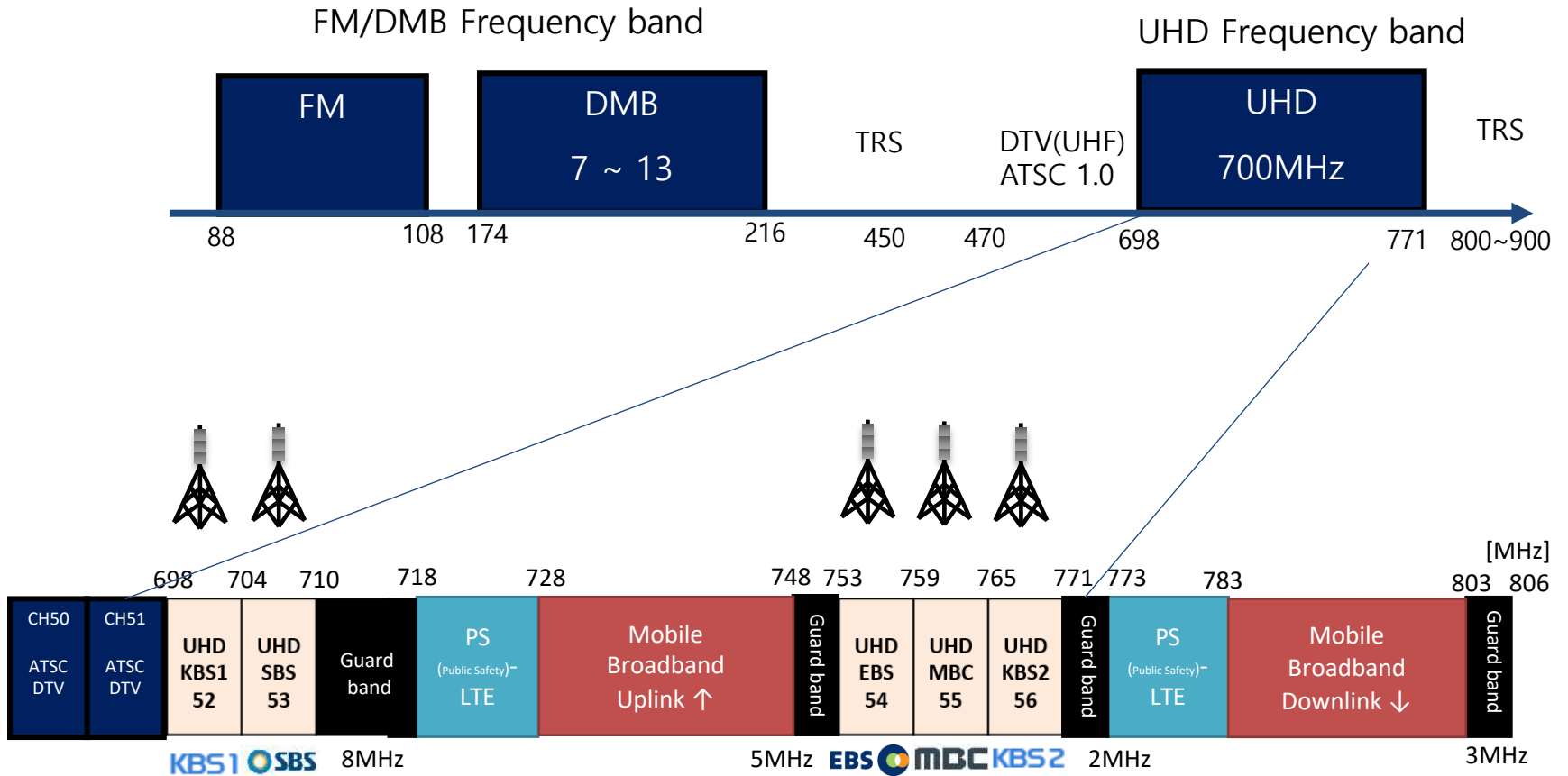
1. UHD Broadcasting Expansion Plan : Rep of KOREA
2. Technical Issues
3. UHD various Challenges

# UHD Broadcasting Expansion Plan

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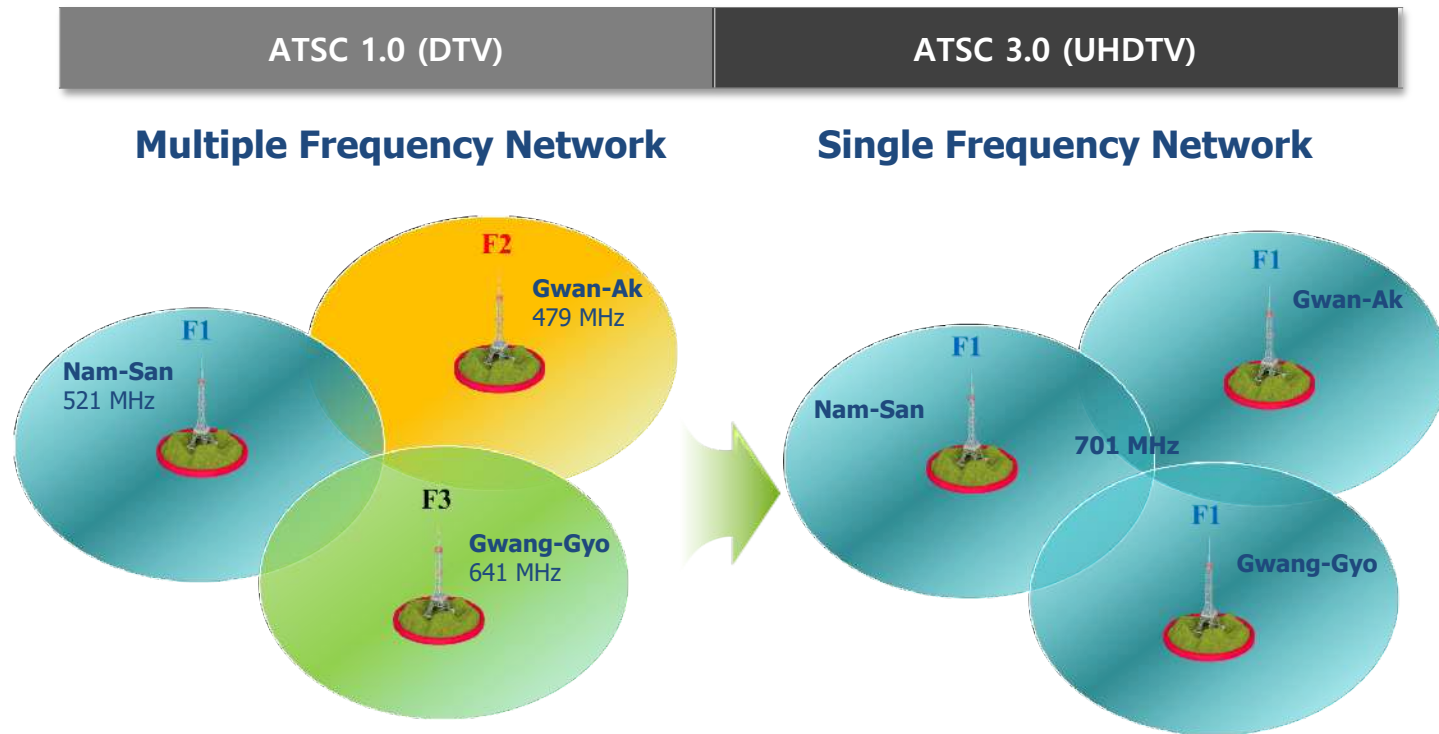


# Reference : UHD Spectrum Allocation

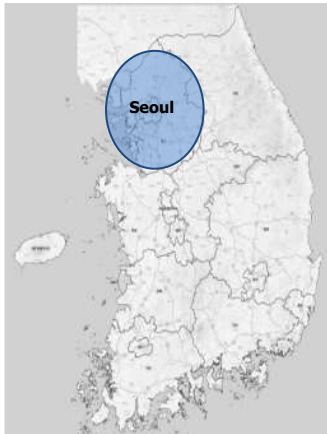


UHD Frequency band(Details)

# Reference : UHD Frequency Allocation policy



# UHD Broadcasting Expansion plan

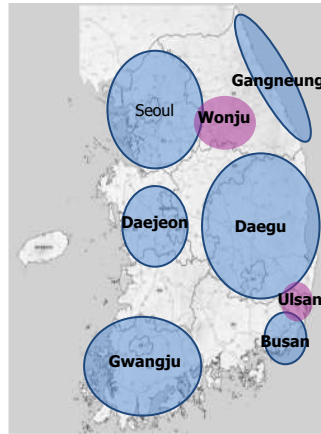


**Phase 1** / May 2017

**2017**

May 31

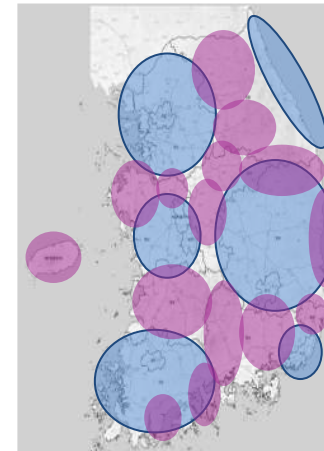
Seoul & Capital Area



**Phase 2** / December 2017

Dec. 28

5 Major Metropolitan Cities & Pyeongchang Winter Olympic



**Phase 3** / 2020~2021

700 MHz frequency band  
- CH 52, 53, 54, 55, 56

470 – 698 MHz DTV band

Deploying Low-Power Relay Stations to Achieve 95 % Service Coverage

2018

2019

2020

2021

2024

2027

DTV Channel Re-Deployment

Nationwide cities & Province

ATSC 1.0 DTV Switch-Off

based on ATSC 1.0 and ATSC 3.0 Co-Channel Interference

Adjacent Channel Interference Protection Ratio

**KBS UHD**  
Ultra High Definition

# ATSC3.0 Broadcasting System



KBS UHD Master Control Room  
HEVC Encoder  
ATSC 3.0 IP Multiplexer  
ATSC 3.0 Broadcast Gateway  
IEEE 1588v2 PTP Master Clock, etc.



RTP/UDP/IP

RF



Transmission Site  
ATSC 3.0 Exciter



ATSC3.0 UHD TV

# Technical Issues

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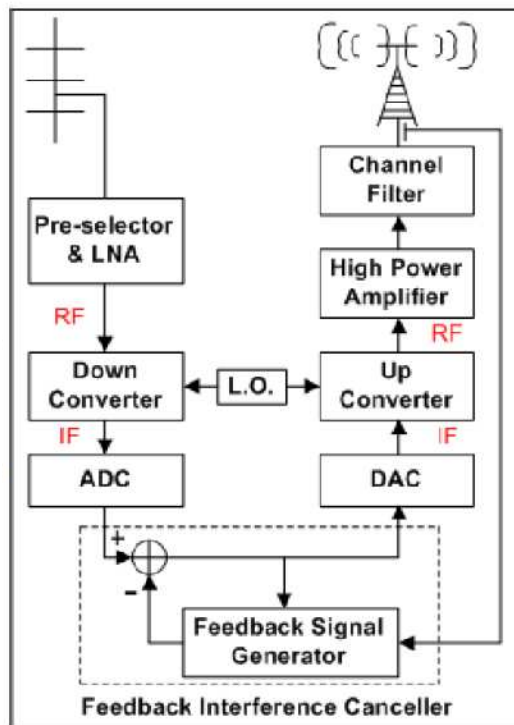
# DTV Channel Redeployment Project

- Due to **the limited 700Mhz frequency (five terrestrial frequencies)** inevitable to use the frequency of the DTV service when opening the UHD broadcasting station considering the local area.
- Period of project : **three divisions from 2017 to 2019**
- Project Manager : **Ministry of Science and ICT, KCA implementation**
- Compensation for losses normally occurs to facilities subject to DTV band frequency reallocation for terrestrial UHD broadcasting nationwide under the Propagation Act

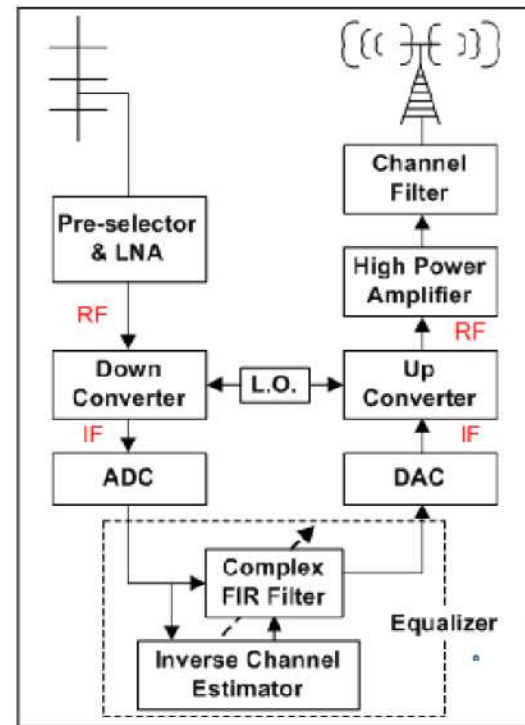
sortation	Execution year	Media number	Loss compensation amount	Channel redeployment date
1st	2017	8	##,### USD	14. JUN : 3 media 21. JUN : 5 media
2nd	2018	24	###,### USD	20. JUN : 16 media 27. JUN : 8 media
3rd	2019	43	###,### USD	30. JUN

# Low power Relay stations issues

- When using M/W or optical wires for IP transmission for UHD SFN network configuration, **large Budget injection is inevitable.**
- Development of **digital on channel repeater(DOCR)** receiving RF transmission to same channel



궤환신호 제거형 OCR

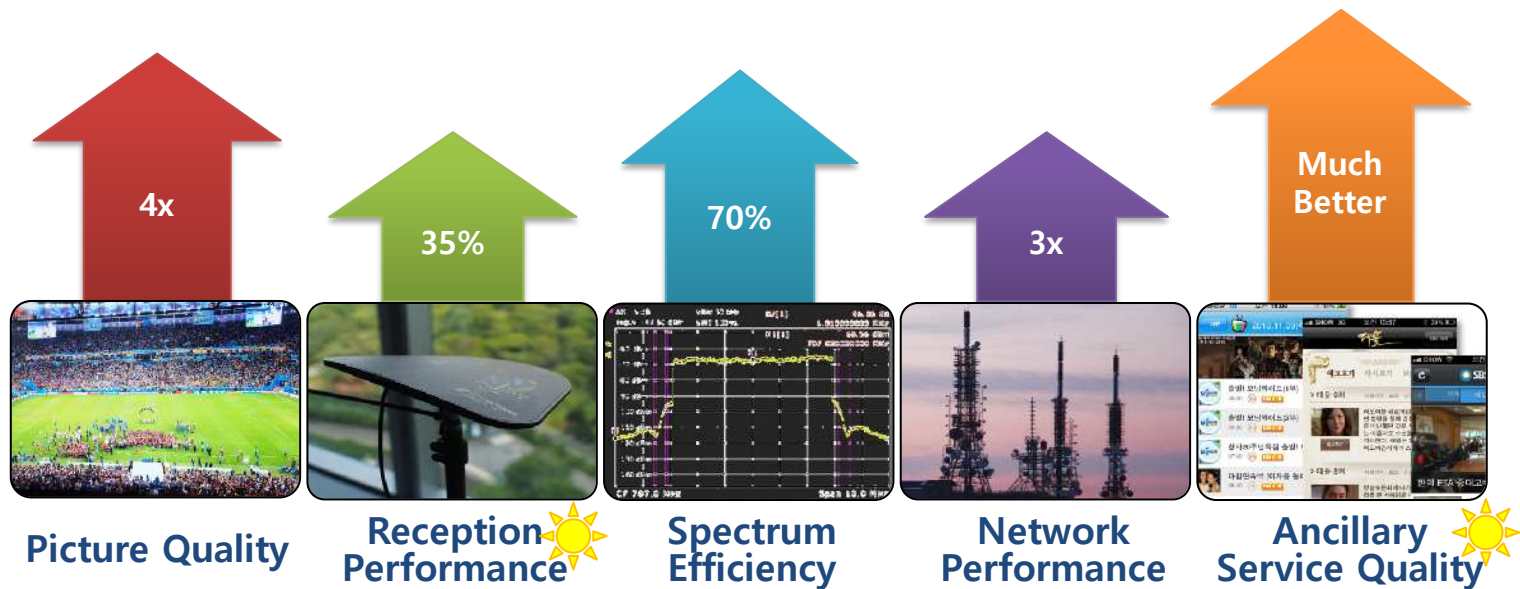


등화형 OCR

# UHD various Challenges

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# Enhancement of ATSC3.0



# 3 Strategies for UHD Broadcasting



High Definition services

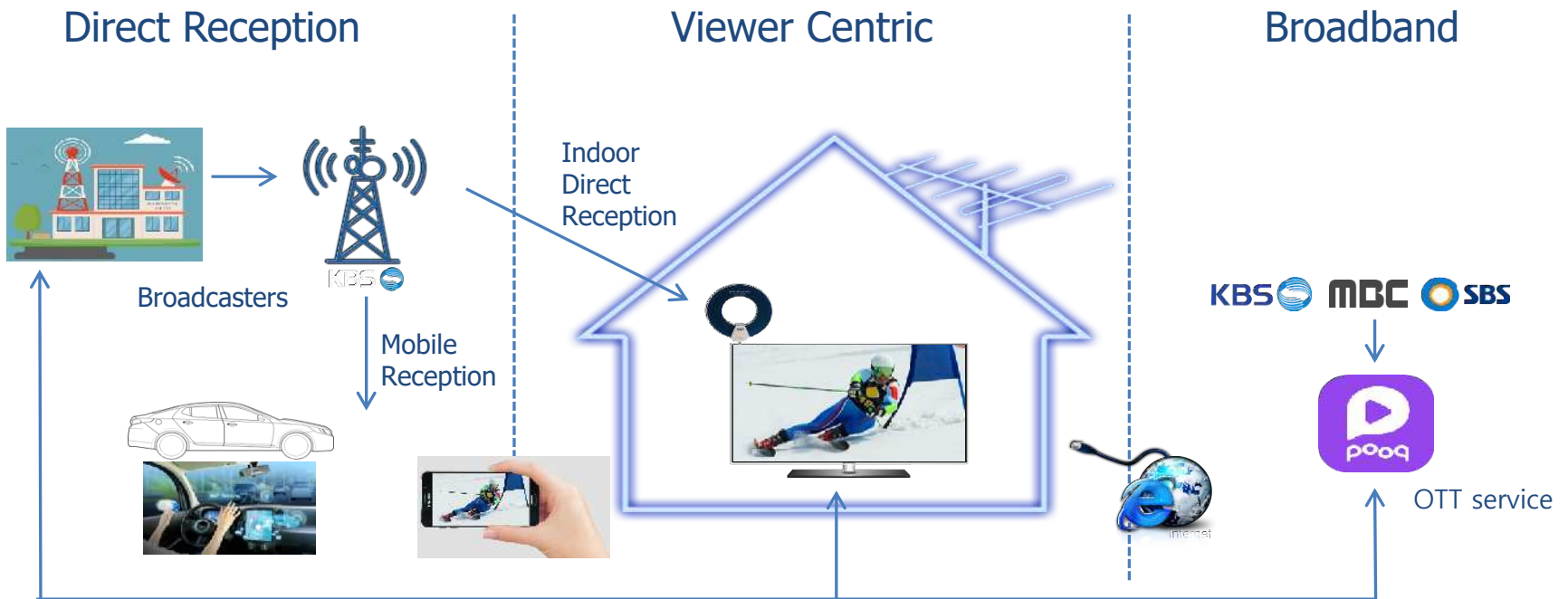


Converged platform services

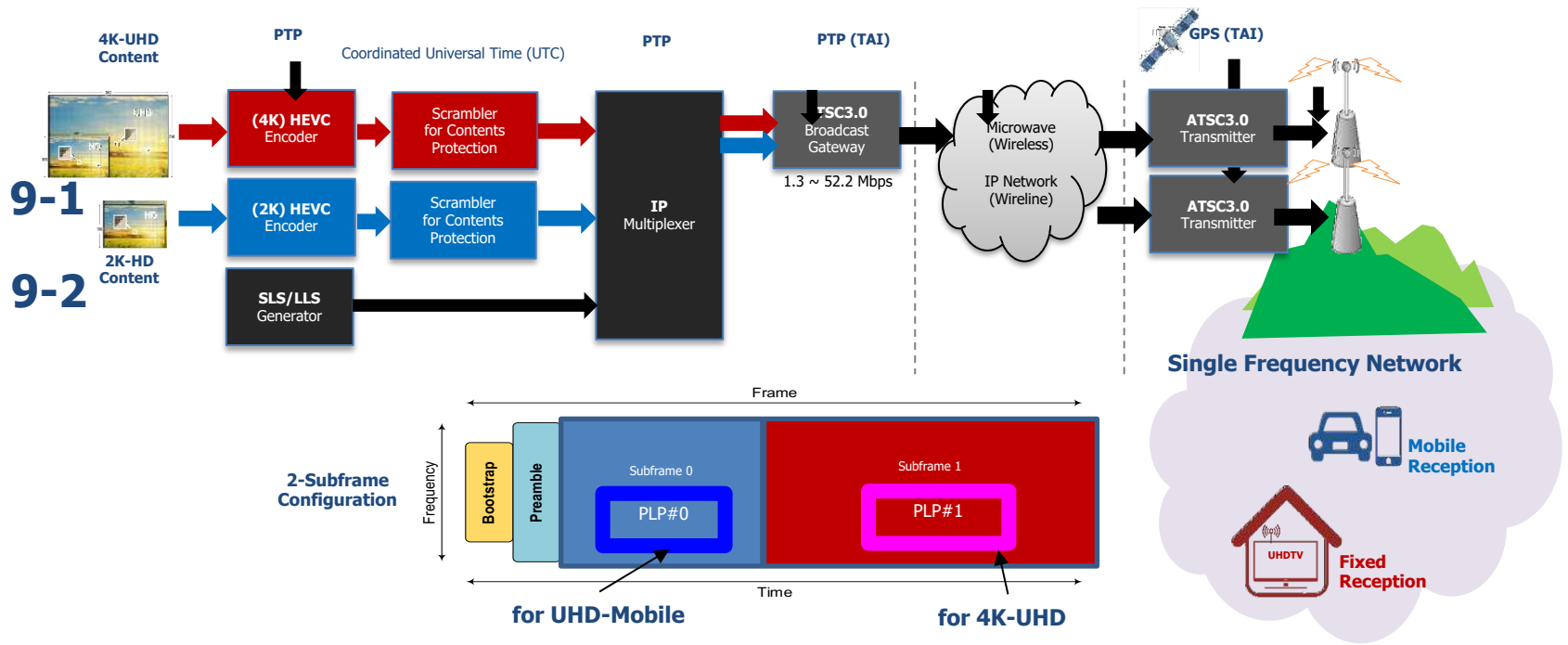


Mobile services

# Rebuild Terrestrial TV Platform

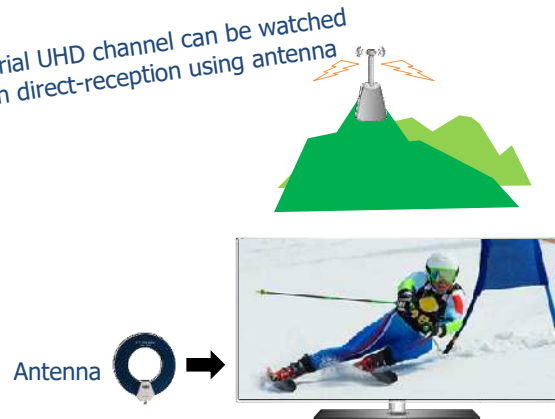


# ATSC3.0 Broadcasting System



## Fixed Reception for 4K-UHD Channel

Terrestrial UHD channel can be watched  
through direct-reception using antenna



## Mobile Reception for UHD-MOBILE Channel



**AS-IS**  
Until now, USB dongle-based  
EXTERNAL receiver only.  
Not sold on the market.

**TO-BE**  
ATSC 3.0 Chipset  
EMBEDDED  
Smartphone



## Showcase for ATSC3.0 UHD Mobile During PyeongChang 2018 Winter Games

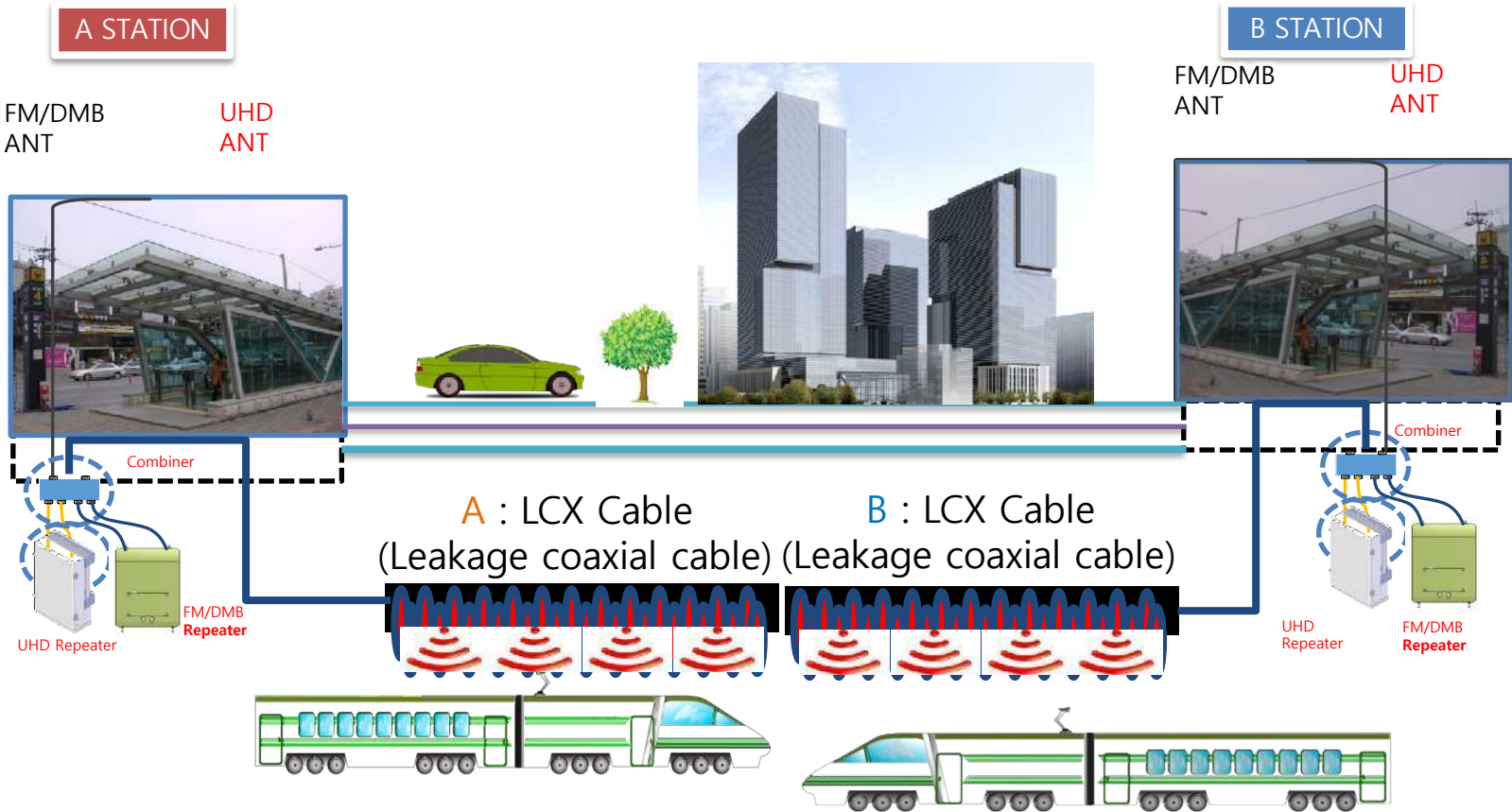


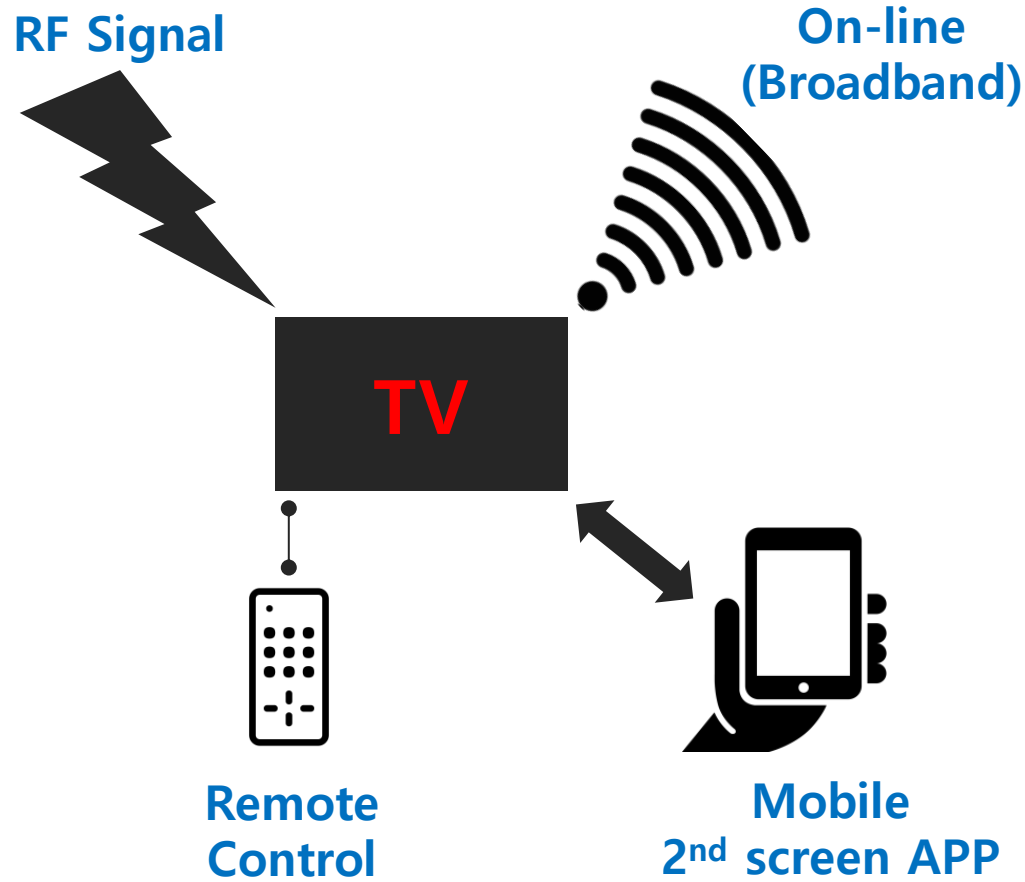
Demonstration Shuttle Bus



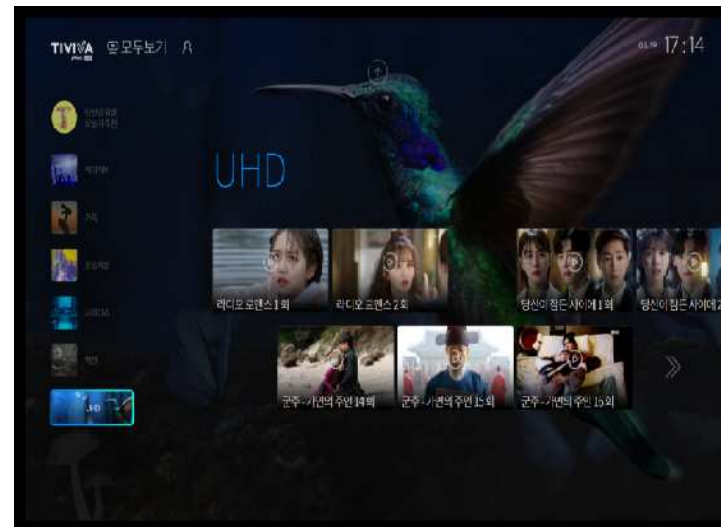
Bus Route for UHD Mobile Showcase

# UHD Subway Mobile Service





Since Nov. 2017







# UHD IBB (Integrated Broadband Broadcast)



## IBB service

- ① 24-hour news channel
- ② disaster broadcasting radio
- ③ Code of National Action against Corona 19
- ④ KBS NEWS official homepage

# Thank you

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