

# **View on AI/ML for NR air interface**

# Issue on AI/ML model generalization (CSI compression)

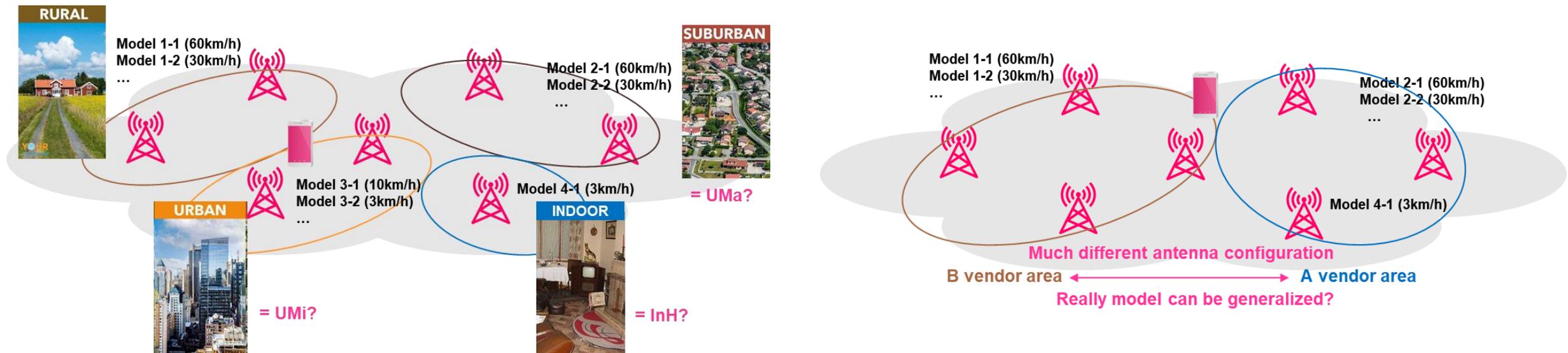
※ In general, for two-sided AI/ML model

## ❑ Ensure generalization on deployment scenario?

- Through study, it can be learned that the small difference of NLOS factors could be generalized. However, whether UMa/UMi can stand for real Suburban/Urban in model training perspective is still not convinced.

## ❑ Ensure generalization on NW vendor?

- Much different antenna configuration should be assumed over multiple vendors.

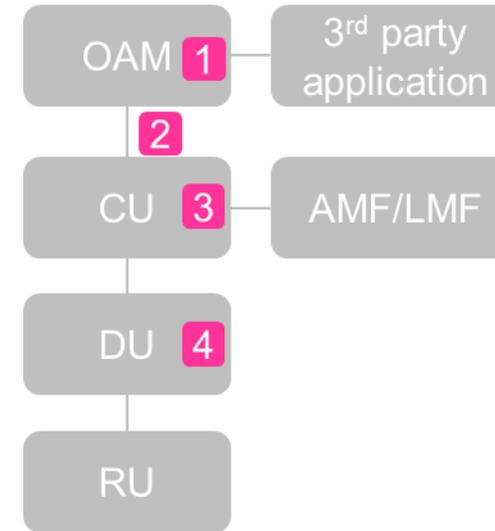


➔ Whole generalization is too risky. Areas with different models need to be considered.

# Issue on AI/ML model training (Common aspect)

## ❑ Model training in OAM is forward compatible?

- Training would depend on location of device from mobility function such as AMF or LMF or 3<sup>rd</sup> party location service. However, current OAM is not associated with it.
- OAM computing process is not scalable and heavy computing process for training seems to suit another dedicated function.
- We could benchmark O-RAN RIC architecture with scalable computing resource and openness to 3<sup>rd</sup> party application.



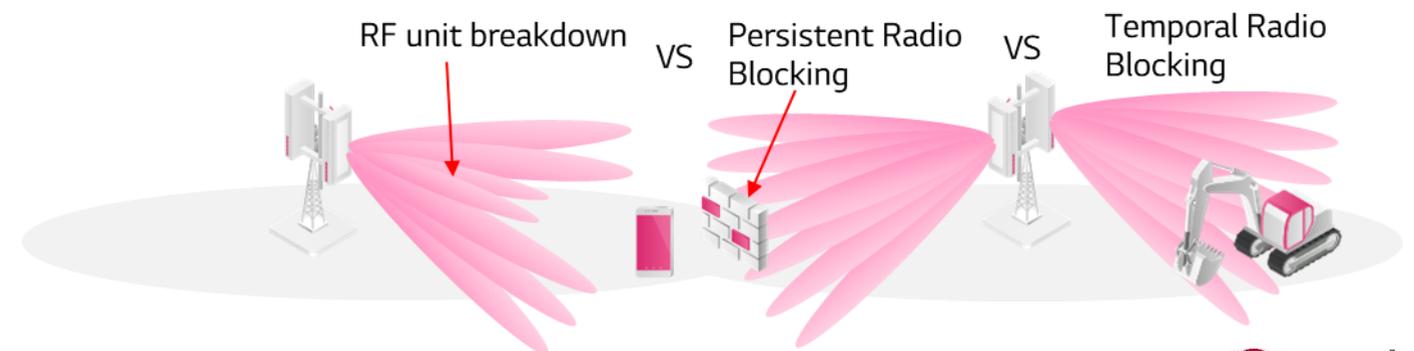
Attr 1: Location information accessibility  
 Attr 2: 3<sup>rd</sup> party application accessibility  
 Attr 3: computing power scalability

	Attr 1	Attr 2	Attr 3
Opt 1	Bad	Good	Bad
Opt 2	Medium	Good	Medium
Opt 3	Good	Bad	Medium
Opt 4	Medium	Bad	Bad

## ❑ How to trigger training feedback for preventing power consumption of device?

- Heavy power consuming in device is not desired.

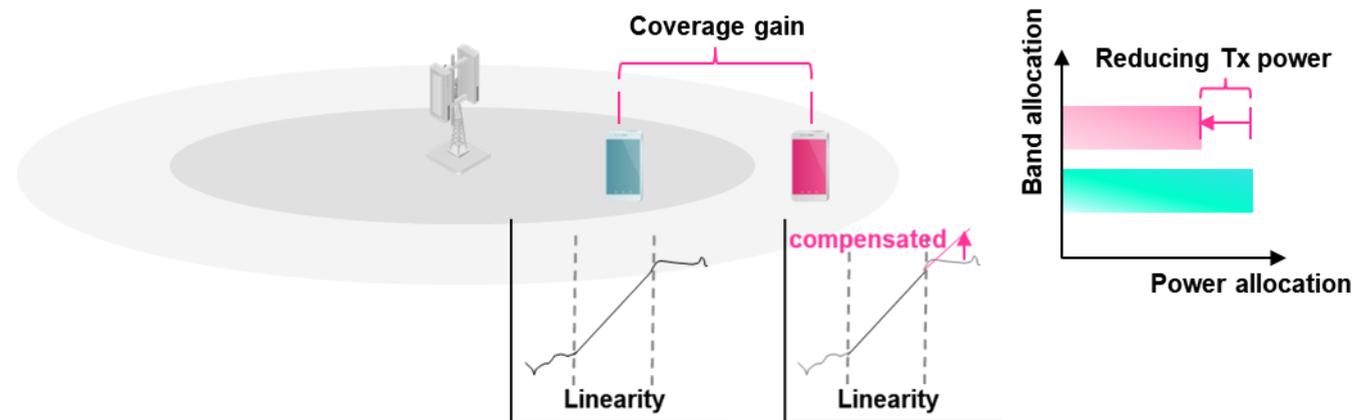
## ❑ How to distinguish temporal event from general situation?



# Addition of AI/ML use case 1 (Energy saving)

## ❑ Energy saving (Power domain solution: AI/ML based PA efficiency enhancement)

- Regarding energy saving, cell DTX scheme might bring unstable cell mobility management even though it could get the best energy saving gain.
- To us, power domain solution seems to be tended, where it is a baseline that mobility relevant signals such as CSI-RS and SSB would be unchanged.
- AI/ML based PA efficiency enhancement (e.g. digital pre-distortion) is not considered in Rel-18 and, however, we propose to study it under the umbrella of AI/ML item.

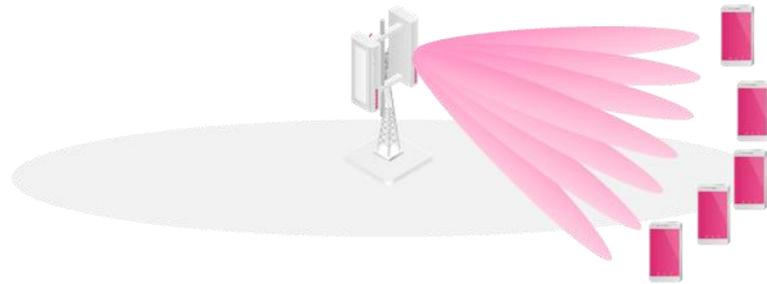


# Addition of AI/ML use case 2 (Beam pattern change)

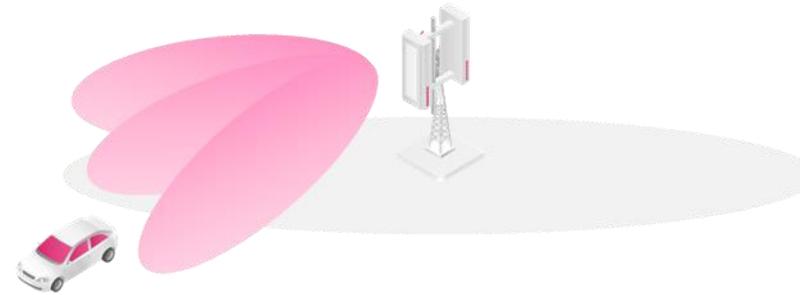
## □ AI/ML

- Usually, gNB has several beam patterns and apply a specific one to a circumstance with static manner.
- An adaptive beam pattern change would be useful for some cases such as devices with different velocities and altitudes.

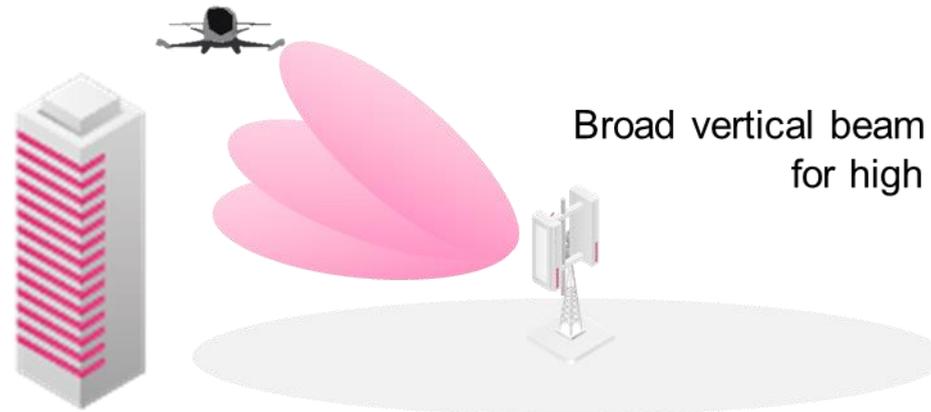
Sharp beams for many devices with low mobility



Long coverage & Broad beams for devices with high mobility



Broad vertical beam pattern for high altitude



# Research topics

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- Areas with different models need to be considered.
- Where to do model training?
- How to trigger training feedback for preventing power consumption of device?
- How to distinguish temporal event from general situation?
- Add AI/ML based PA efficiency enhancement into SI.

Thank you!

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