RP-201157

# WID Revision Proposal: Increase Max DL TBS for LTE-M

Source: Sierra Wireless, Ericsson, Sony, Verizon, Telstra, AT&T, Nokia

# Background/History

- LPWA DL Speed Improvement History

  LTE-M HD-FDD CAT-M1:

| | |
|---|---|
| Rel 13 TBS 1000 | 300 kbps |
| Rel 14 Ack Bundling | 588 kbps |
| Rel 17 14 HARQ | ~700 kbps |

  NB-IOT:

| | |
|---|---|
| Rel 13 NB1 | 28 kbps |
| Rel 14 NB2 2 HARQs + TBS 1352 | 127 kbps |
| Rel 17 16 QAM + TBS ~2600 | ~250 kbps |

- Increase DL TBS technique
  - Can be optionally applied on top of Ack Bundling and 14 HARQ technique
  - Improvement ~proportional to TBS increase
    - E.g. TBS 1000=>1800 will provide ~80% speed increase

# Motivation

- Similar motivations as the Rel 17 NB-IOT 16 QAM feature
- Market expansion
  - Improve support for watches and wearables
  - Support for high data rate music or small format video
  - Improved firmware download
  - Improved user experience e.g. quicker point-of-sale transactions
- Improved spectral efficiency
- Improved battery life (i.e. allows UE to go to a low power state quicker)
- Given the trend to deploy denser cells for NR, higher TBS can often be utilized
- Improved differentiation between NB-IOT and LTE-M
  - Note: NB-IOT release 17 will increase speed by ~2X
- Easy specification change (details on next page)
- Easy commercialization (details on next page)

# Specification and Commercialization

## Minimal specification changes:

- Only needed for CE mode A
- New UE capability by RAN2 – no new UE category
- New DL TBS decided by RAN1
  - Option 1: TBS 1736 – no DCI or TBS table changes needed – speed increase of 73.6%
  - Option 2: TBS >1736 – needs DCI format 6-1A change
- Soft buffer size decided by RAN1

## Easy commercialization

- Some commercial CAT-M1 chipsets can support increased DL TBS with a firmware change – thus no market fragmentation
- Easy change to eNB scheduler

# WID Changes

- Proposal to add the following objective to the WID:

  - For CE mode A, increase the maximum DL TBS to at least 1736 [LTE-MTC] [RAN1,RAN2]
    - Determine maximum DL TBS and soft buffer size [RAN1]
    - Capability signalling [RAN2]

Thank you