[102-e-NR-5G\_V2X\_NRSL-PHYstructure-02] Email discussion/approval w.r.t. “max data rate for SL and TBS”: 2A, 3A, 3B (as in the summary) by 08/20, with potential TPs by 8/25 – Jeongho (Samsung)

This document has the following questions.

A. Max data rate definition for SL

B. 2nd SCI overhead for TBS determination

C. MCS restriction for TBS determination

# **A. Max data rate definition for SL**

This is to handle the LS from RAN2, which is found in R1-2003258. The related contributions submitted to RAN1#102-e are [vivo], [LGE], [Huawei, HiSilicon], [Samsung], [Apple], [OPPO, R1-2006001].

In TS38,306, the max data rate for NR is defined. For the max data rate for sidelink, can the existing data rate formula be reused? That is to reuse the following formula and modification:

$data rate (in Mbps)=10^{-6}⋅v\_{Layers}⋅Q\_{m}⋅f⋅R\_{max}⋅\frac{N\_{PRB}^{BW,μ}⋅12}{T\_{s}^{μ}}⋅\left(1-OH\right)$ (2)

wherein

Rmax = 948/1024

$v\_{Layers}$ is the maximum number of supported layers by higher layer parameter.

$Q\_{m}$ is the maximum supported modulation order by higher layer parameter.

$f$ is the scaling factor, which is 1.

$μ$ is the numerology (as defined in TS 38.211).

$T\_{s}^{μ}$ is the average OFDM symbol duration in a subframe for numerology $μ$, i.e. $T\_{s}^{μ}=\frac{10^{-3}}{14⋅2^{μ}}$.

Note that normal cyclic prefix is assumed.

$N\_{PRB}^{BW,μ}$ is the maximum RB allocation in bandwidth $BW$ with numerology $μ$, as defined in TS 38.101-1 and TS 38.101-2, where $BW$ is the UE supported maximum bandwidth for a given band.

$OH$ is the overhead and takes the following values

x, for frequency range FR1 for SL

y, for frequency range FR2 for SL

The modifications from NR Uu are as below:

* The max number of layers is depending on UE capability.
* Qm is depending on UE capability.
* f is fixed as 1.
* OH is as x for FR1 and y for FR2.

Please provide the above definition for the max data rate for SL and also provide the values of x and y for OH in sidelink.

If further modification is needed, please provide the views and reason.

If other alternative is needed, please provide the views and reason.

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# **B. 2nd SCI overhead for TBS determination**

From the agreement in RAN1#101-e, the actual number of REs for 2nd SCI is considered for TBS determination with having the following:

- $N\_{RE}^{SCI,2}$ is the number of coded modulation symbols generated for 2nd-stage SCI transmission (prior to duplication for the 2nd layer, if present) according to Clause 8.4.4 of [5, TS 38.212].

A number of contributions [ZTE, Sanechips], [vivo], [CATT], [Huawei, HiSilicon], [Intel], [InterDigital], [Samsung], [Ericsson], [Apple], [Panasonic], [NTT DCM] proposed some modifications for the overhead consideration of 2nd SCI.

Please provide your views on the following alternatives:

* Alt 1. No changes
* Alt 2. Assuming the gamma as zero for the 2nd SCI
* Alt 3. Other modification(s), if any.

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# **C. MCS restriction for TBS determination**

There are two contributions [Intel], [Sharp] for MCS restriction: one is proposing not to use the code point only indicating Qm, and another is proposing not to change MCS table between initial transmission and retransmission.

Please provide your views on the following alternatives:

Alt 1. No need to restrict

Alt 2. Not use the MCS code point only indicating the modulation order

Alt 3. Not change MCS table between initial transmission and retransmission.

Alt 4. Other restriction(s), if any.

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Reference

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3. R1-2005338 Remaining issues on physical layer structure for NR sidelink vivo
4. R1-2005646 Discussion on sidelink physical layer structure MediaTek Inc.
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13. R1-2006099 On Physical Layer Structures for NR Sidelink Samsung
14. R1-2006254 Remaining issues for sidelink physical layer structure Spreadtrum Communications
15. R1-2006433 TPs related to PHY structures Ericsson
16. R1-2006484 On Remaining Issues of Sidelink Physical Layer Structure Apple
17. R1-2006535 Remaining issue on physical layer structure for sidelink in NR V2X Panasonic Corporation
18. R1-2006557 Remaining issues on physical layer structure for NR sidelink Sharp
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20. R1-2006693 Maintenance for sidelink physical layer structure NTT DOCOMO, INC.
21. R1-2006768 Sidelink Physical Layer Structure Qualcomm Incorporated