5GAA-WG5-Tolling-Comments on Draft Tolling Work Item white paper

**Tolling Application with C-V2X——Final Report**

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Comments from Qualcomm

* The paper assumes there’s no interference problem between 5.9GHz PC5 and 5.8GHz DSRC-tolling during the assumed ‘transition’ from 5.8 DSRC to PC5-based tolling. In China, ETC is 5790-5800 MHz UL and 5830-5840 MHz DL. LTE-V2X is 5905-5925 MHz and it requires testing to ensure there is no interference between the bands, so this is probably not a good assumption without having a sufficient guard band. Would tolling applications in safety spectrum negatively impact safety applications in areas with high tolling activity?
* Thus far, the analysis has assumed the ITS PC5 rollout being able to ‘fold in’ tolling applications, essentially replacing current point-to-point RF with PC5. What’s not clear is what the price/economic comparison is of PC5-based tolling to tolling transactions that rely substantially on the UU connection (GNSS-based tolling). Unless we fully understand where UU vs. PC5 tolling could be done, the ‘benefit’ arguments of the paper are difficult to gage.
* In the CAPEX/OPEX calculations, the paper assumes PC5 RSU tolling applications can coattail a lot on C-ITS RSU unit deployment. It’s not clear that we can assume that current LTE-V2X spectrum can support both V2X functions and tolling functions running simultaneously.
* In the paper, a large communication range is considered a big advantage of PC5, but in fact it will also bring technical difficulties since in the coverage of an RSU, there will be multiple OBUs performing transactions at the same time (which has challenge on RSU’s processing capability and complexity). Tolling RSUs, for example, may require multiple crypto processors (HSMs) for any roadside V2X communications security (e.g., decryption). Will tolling RSUs have to be highly specialized to handle tolling transactions?
* For the starting time, the paper said “PC5 based tolling is ready for application (starting 2021)”. This is probably too optimistic. Even from a standards point of view, currently only the tolling application scenarios are described in CSAE/CAICV standards. LTE-V2X tolling standards may take a lot more time to develop and will likely not be ready for 2021 rollouts.