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April 1, 2019
VIA ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

REDACTED – FOR PUBLIC INSPECTION

**Re: Notification of Written *Ex Parte* Presentation
Applications of T-Mobile US, Inc. and Sprint Corporation for Consent to Transfer
Control of Licenses and Authorizations; WT Docket No. 18-197**

Dear Ms. Dortch:

Pursuant to Section 1.1206(b) of the Commission’s Rules, 47 C.F.R. § 1.1206(b), T-Mobile US, Inc. (“T-Mobile”) submits a written *ex parte* presentation in the above-captioned docket. This filing discusses adjustments that have been made to the network engineering model to enable it to be extended to the 2019-2020 network integration period and allow for associated supplemental economic work.

The engineering model provided to the Commission on September 17, 2018 was used for determining the capacity, congestion, and performance of the merged network resulting from a combination of T-Mobile and Sprint Corporation (“Sprint” and, together with T-Mobile, “Applicants”) relative to the standalone companies.¹ However, that model covered only the period 2021-2024—after the networks were combined and subscribers were fully migrated to the New T-Mobile network. To respond to questions from the FCC staff and to address assertions from opponents, the Applicants extended the model to cover the 2019-2020 integration period, which enabled the Applicants’ economists to conduct a variety of additional economic analyses. These analyses required adjustments to the model, which are divided into two categories: (1) additional functionality, which allow certain supplemental economic sensitivity analyses to be performed; and (2) updates to certain input values used in the model, which have no effect on the

¹ *Ex Parte* Presentation of T-Mobile US, Inc., WT Docket No. 18-197, filed Sept. 17, 2018.



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model’s structure. In Attachment A to this *ex parte* filing, these adjustments are described in detail.²

This filing contains information that is “Highly Confidential” pursuant to the Protective Order filed in WT Docket No. 18-197. Accordingly, pursuant to the procedures set forth in the Protective Order, a copy of the filing is being provided to the Secretary’s Office. In addition, two copies of the Highly Confidential Filing are being delivered to Kathy Harris, Wireless Telecommunications Bureau. A copy of the Redacted Highly Confidential Filing is being filed electronically through the Commission’s Electronic Comment Filing System.

Please direct any questions regarding the foregoing to the undersigned.

Respectfully submitted,

DLA Piper LLP (US)

/s/ Nancy J. Victory

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 Partner

cc: David Lawrence
 Kathy Harris
 Linda Ray
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 David Krech

² These adjustments do not have a material effect on the final conclusions of the Israel, Katz, and Keating (“IKK”) analysis for 2021-2024 that were provided to the Commission in September 2018.

ATTACHMENT A

As part of the Applicants’ responses to further questions from the FCC staff and further assertions from the Applicants’ opponents, two submissions with minor modifications to specific implementation details of the engineering model have been made—on February 7, 2019 and March 7, 2019—as detailed below. To be clear, none of these modifications in any way constitutes a “new model.” The engineering model remains the model submitted on September 17, 2018, simply incorporating the minor modifications made below. These modifications have been made to: (i) allow the model to be used to respond fully to specific questions that have been raised by the Commission and (ii) update the inputs to the model to use the most current information. The version of the model submitted on March 7, 2019 was further updated to include a sensitivity case with the addition of traffic from in-home broadband service but did not make any changes to the model’s operation in the baseline case. The relevant files are as follows:

- IKK Reply Declaration (September 17, 2018)³
 - Montana_Capacity_Analysis_Sprint_IKK_Reply_Backup.xlsx
 - Montana_Capacity_Analysis_T-Mobile_IKK_Reply_Backup.xlsx
 - Montana_Capacity_Analysis_New_T-Mobile_IKK_Reply_Backup_Maintain.xlsx
 - Montana_Capacity_Analysis_New_T-Mobile_IKK_Reply_Backup_Relax.xlsx
- IKK Submission for 2019-2020 (February 21, 2019)⁴
 - Montana_Capacity_Analysis_Submission_Sprint.xlsx
 - Montana_Capacity_Analysis_Submission_T-Mobile.xlsx
 - Montana_Capacity_Analysis_Submission_New_T-Mobile.xlsx
- IKK Submission for in-home broadband (March 7, 2019)⁵
 - Montana_Capacity_Analysis_In-Home_Broadband_Submission_New_T-Mobile.xlsx

Introductory notes

The discussion below uses the following shorthand: Standalone Sprint (“SAS”), Standalone T-Mobile (“SATM”), and New T-Mobile (“NewTM”). For each change, the relevant models are shown in parenthesis in the header.

The changes for 2019-2020 largely involve adding columns to enable runs for 2019 and 2020 plans (similar to 2021-2024) to all inputs that vary by year (traffic forecast, spectrum available/deployed, handset feature penetration, etc.). These additions are highlighted in light red in the submitted models – see the following tabs: Scenarios, Level2_LTE, Level2_5G,

³ *Ex Parte* Presentation of T-Mobile US, Inc., WT Docket No. 18-197, filed Sept. 18, 2018 (IKK 9/17/2018 declaration).

⁴ *Ex Parte* Presentation of T-Mobile US, Inc., WT Docket No. 18-197, filed Feb. 21, 2019 (IKK 2/21/2019 submission).

⁵ *Ex Parte* Presentation of T-Mobile US, Inc., WT Docket No. 18-197, filed March 7, 2019 (IKK 3/6/2019 submission).

SiteRef, InputCalcs, and Demand. In addition, rows were added to the Scenario tab to allow the congestion thresholds to vary by year and solutions to be turned on/off (also highlighted in light red).

Deployment of 2.5 GHz spectrum for LTE (SAS and NewTM)

In the September 2018 version of the SAS model, when a 5G upgrade solution is chosen, it results in [REDACTED]

[REDACTED]. [REDACTED]

[REDACTED] In the February 2019 version, [REDACTED].⁶ The latter is implemented in columns Q to W of the Level3_LTE tab of the February 2019 version of the SAS model (highlighted in green). The amount of 2.5 GHz spectrum available for LTE at each site in each year is specified in columns CF to CK of the SiteRef tab.

A corresponding modification is implemented in the NewTM model. For consistency, [REDACTED]

[REDACTED]

[REDACTED].⁷ The NewTM model also

[REDACTED]

[REDACTED].⁸

These modifications are implemented in columns Q through AF of the Level3_LTE tab in the February 2019 version of NewTM model (highlighted in green). In addition, the first scenario for NewTM (when a 2.5 GHz overlay is implemented for LTE congestion), this is implemented in columns AK-AL of the Level3_5G tab (highlighted in green).⁹

Addition of AWS/PCS and mmWave spectrum overlays to solution set (SATM and NewTM)

In the September 2018 version of the NewTM model, deployment of AWS/PCS spectrum for 5G was included as part of the baseline plan, but the model did not have the option [REDACTED]

[REDACTED]. This option has been added in the February 2019 version of the NewTM model.¹⁰ [REDACTED]

[REDACTED]. This change is implemented in columns AV to BG of the Level3_5G tab of the NewTM model (highlighted in green).

⁶ See IKK 2/21/2019 submission, p. 30.

⁷ See IKK 2/21/2019 submission, p. 30.

⁸ See IKK 2/21/2019 submission, p. 30.

⁹ None of the changes discussed in this sector are applicable to SATM because SATM does not have 2.5 GHz spectrum.

¹⁰ See IKK 2/21/2019 submission, p. 30. This change is [REDACTED]

Similarly, the September 2018 versions of the SATM and NewTM models included deployment of mmWave spectrum as part of the baseline plans, [REDACTED]

[REDACTED] The option to overlay mmWave spectrum, where available, has been added to the solution set in the February 2019 versions.¹¹ Overlays of mmWave spectrum are placed in the solution hierarchy after AWS/PCS overlays and before small cells. This adjustment is implemented in the Level3_5G tab—columns AU to BF of the SATM model and columns BH through BS of the NewTM model.¹²

Use of updated and more disaggregated unit costs (SAS, SATM, NewTM)

As described in the IKK February 2019 submission,¹³ the February 2019 versions of the Network Build Model incorporate updated and [REDACTED]

[REDACTED] The unit cost figures are not used in the Network Build Model itself; they are implemented in the Financial Backend Model.¹⁴

In the Network Build Model, solution counts are added to track the different solution configurations. In general, [REDACTED]

[REDACTED]. Then, the model [REDACTED]

[REDACTED]. These add-on solution counts are implemented in Level3_5G tab: columns CY to DA of the SATM model and columns DL to DS of NewTM model ([REDACTED]).

Sprint model (SAS) assumptions

The February 2019 version of the SAS model incorporates the following changes to assumptions in the SAS model:

- The February 2019 version updates the input traffic to use [REDACTED].¹⁵ This is implemented in rows 4, 8, 21, and 22 of the Demand tab.
- The February 2019 version includes some minor additions to the Sprint baseline plan based on feedback from Sprint about its most current plans.¹⁶ This is implemented in columns BD to BG of the SiteRef tab.

¹¹ See IKK 2/21/2019 submission, p. 29.

¹² When solution options are added in the hierarchy, formulas for subsequent solutions must be modified to take into account the effect of the new option. For example, if the hierarch was A-B-C-D, and option E is added between B and C, then the formulas for option C must be modified to account for the impact of E. Such changes to subsequent formulas are highlighted in the Feb-2019 versions.

¹³ See IKK 2/21/2019 submission, p. 31.

¹⁴ See “Financial Backend Model_IKK_with20192020.xlsx”, tab “Inputs” in the IKK 2/21/2019 submission backup.

¹⁵ See IKK 2/21/2019 submission, p. 31.

¹⁶ See IKK 2/21/2019 submission, p. 31.

- The February 2019 version includes cases that use an alternative assumption for the congestion threshold for LTE sectors with 5G handset traffic “leakage” in 2024: [REDACTED] [REDACTED]¹⁷ This sensitivity reflects uncertainty on Sprint’s part about when it will phase in the full [REDACTED] threshold for leakage traffic. It is implemented in scenario numbers 3-6 on the Scenarios tab.

Financial constraints (SATM, NewTM)

As discussed in the IKK September 2018 declaration, the 5G usage assumptions for SATM are [REDACTED].¹⁸ This constraint is applied outside the Network Build Model and the result is fed into row 17 of the Demand tab in the SATM model. In the September 2018 version, this resulted in usage of [REDACTED] in 2021-2024. The various changes implemented in the February 2019 version affect SATM’s OpEx – e.g., [REDACTED]. Reapplying the same constraint in light of the changed OpEx raises SATM usage to [REDACTED] in 2021-2024, and these are therefore the values that were used in the February 2019 version. This change is not a change to the Network Build Model itself, but to a calculation done outside of the Network Build Model to reflect the impact of the other changes above.

The above, along with the changes to the SAS traffic assumptions discussed in the prior section, also affect the 5G usage for the NewTM Maintain case, in which usage on the NewTM network is assumed to equal the sum of SAS and SATM usage. NewTM Maintain usage thus increases from [REDACTED] in 2021-2024. This modification is similarly implemented in row 46 of the Demand tab in the February 2019 version of the NewTM model.

Use empirical loading curve to assess LTE network throughput (SAS, SATM, NewTM)

As described in the IKK 2/20/2019 submission, the IKK analysis submitted in February 2019 uses an empirical loading curve to assess LTE network throughput,¹⁹ which was not used in the prior modeling. This LTE throughput analysis is not implemented in the Network Build Model spreadsheet itself, but rather it is implemented in the programs accompanying the Network Build Model.²⁰

Addition of traffic from in-home broadband (NewTM)

As discussed in the IKK 3/6/2019 submission, the NewTM model was modified to incorporate traffic from in-home broadband service. This modification was implemented through the additional of three parameters on the Scenarios tab (scenario numbers 17-24, rows 24-26), which specify: the in-home subscriber count scenario, the in-home usage per subscriber-month, and the

¹⁷ See IKK 2/21/2019 submission, p. 28.

¹⁸ Joint Opposition of T-Mobile US, Inc. and Sprint Corporation, WT Docket No. 18-197, filed Sept. 17, 2018, Appendix F (IKK Declaration), ¶ 80.

¹⁹ See IKK 2/21/2019 submission, pp. 22-27.

²⁰ See “(2.0) AppendData.do” (lines 126-208) in the IKK 2/21/2019 submission backup.

in-home busy hour factor. The subscriber counts by sector in each scenario (none, 2021, and 2024) are specified in columns AD to AG of the Level2_5G tab. The monthly and busy hour carried traffic for in-home calculations – i.e., adding in-home traffic to mobile traffic – are implemented in columns G to L of the Level2_5G tab and columns J to O of the Level3_5G tab. In addition, all sectors with in-home broadband traffic that are not 5G are automatically upgraded to 5G (regardless of congestion) – this is implemented in columns G to H of the Level3_LTE tab.²¹

²¹ All changes related to in-home broadband are highlighted in orange in the March 2019 version.