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September 5, 2018

**BY HAND DELIVERY**

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th St., S.W. - The Portals  
Washington, D.C. 20554

**HIGHLY CONFIDENTIAL INFORMATION – SUBJECT TO  
PROTECTIVE ORDER IN WT DOCKET NO. 18-197 BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION**

Re: Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign Licenses, WT Docket No. No. 18-197

Dear Ms. Dortch:

T-Mobile US, Inc. (“T-Mobile”) herewith responds to the August 15, 2018, General Information and Document Request from the Federal Communications Commission (the “Commission”) in the above-referenced docket.<sup>1</sup> Enclosed, please find:

- A hard drive containing the load files and production index associated with the document requests in the Information Request, containing items tagged as “Highly Confidential,” “Confidential,” and “Public,” per the Protective Order;<sup>2</sup>

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<sup>1</sup> Letter from Donald K. Stockdale, Jr., Chief, Wireless Telecommunications Bureau, to Kathleen O’Brien Ham, T-Mobile U.S., Inc., WT Docket No. 18-197 (Aug. 15, 2018) (“*Information Request*”).

<sup>2</sup> Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign Licenses, Protective Order, WT Docket No. No. 18-197 (June 15, 2018) (“Protective Order”). Pursuant to discussions with Staff, custodial documents and data and materials being provided with this response, unless specifically reviewed and downgraded, have been classified as “Highly Confidential.” Notwithstanding that default classification, Applicants are not asserting Highly

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- Three DVD-ROMs, two containing engineering data and materials and one containing economic data and materials, all associated with specifications in the Information Request, and each designated as “Highly Confidential,” “Confidential” or “Public” per the Protective Order.

This filing contains information that is “Highly Confidential” pursuant to the Protective Order in WT Docket No. 18-197. Accordingly, pursuant to the procedures set forth in the Information Request and Protective Order, a copy of the Highly Confidential filing (including the encrypted hard drive and responsive DVD-ROMs) is being provided to the Secretary’s Office. In addition, two copies of the Highly Confidential Filing (including responsive DVD-ROMs) are being delivered to Katherine Harris, Wireless Telecommunications Bureau. Pursuant to the direction of the FCC Transaction Team, one copy of the encrypted hard drive containing the Highly Confidential document production is being delivered to the FCC’s e-Discovery vendor. In addition, a redacted copy of this Highly Confidential Filing is being labeled as “Public – Redacted” and being filed electronically through the Commission’s Electronic Comment Filing System in the above-referenced docket.

T-Mobile and its majority shareholder Deutsche Telekom AG (“DT”) have made diligent efforts to ensure that none of the documents being submitted herewith are privileged under the attorney-client privilege or attorney work product doctrine. To the extent that any privileged documents may have been inadvertently produced, such production does not constitute waiver of any applicable privilege. T-Mobile and DT request that any privileged documents inadvertently produced be returned to T-Mobile as soon as such inadvertent production is discovered by any party, and reserve all rights to seek the return of any such documents.

Should any questions arise concerning the Response or the electronic media provided in connection with this filing, please do not hesitate to contact the undersigned counsel for T-Mobile and DT.

Best regards,

*/s/ Nancy J. Victory*  
Nancy J. Victory

Attachments

cc: Katherine Harris

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Confidential status for any documents that have been publicly released (which would be Public) or for third party materials that are copyrighted (which would be considered Confidential).

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**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

Applications of )  
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T-Mobile USA, Inc., ) WT Docket No. 18-197  
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and )  
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Sprint Corporation )  
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For Consent to Transfer of Control of )  
Licenses and Authorizations )

**RESPONSE TO INFORMATION REQUEST  
BY T-MOBILE US, INC.**

T-Mobile US, Inc. (“T-Mobile” or the “Company”) and Deutsche Telekom AG (“DT,” and with T-Mobile, the “Applicants”) hereby provide narrative responses and explanations relevant to the Specifications in the FCC’s General Information and Discovery Request dated August 15, 2018.<sup>1</sup> As noted in the cover letter accompanying this submission, T-Mobile has provided other responsive documents and data in the form of electronic media delivered to the FCC, including a series of standalone files (the “Data Production”) and a database of documents compatible with the FCC’s document review software (the “Document Production”). This filing provides a specification-by-specification response to the *Information Request*, referencing the Document Production or Data Production as appropriate, including narrative discussions where

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<sup>1</sup> Letter from Donald K. Stockdale, Jr., Chief, Wireless Telecommunications Bureau, to Kathleen O’Brien Ham, T-Mobile U.S., Inc., WT Docket No. 18-197 (Aug. 15, 2018) (“*Information Request*”).

requested, and memorializing clarifications, assumptions, and explanations on certain specifications.

Pursuant to discussions with the FCC Transaction Team, documents responsive to *Information Request* Specifications for “all documents” or similar language are provided as part of the Document Production. The Document Production comprises the custodial documents provided to the Department of Justice (“DOJ”) under the Second Request (or targeted items subject to certain prior requests by the DOJ).<sup>2</sup> The Applicants have provided, or will provide, all non-privileged custodial documents that were identified as responsive to the Second Request.<sup>3</sup> The Applicants have reviewed the FCC Specifications requesting “all documents” or similar phrasing and believe that the documents responsive to such FCC Specifications are within the Second Request documents being provided to the DOJ, as bounded by the universe of custodians and date ranges agreed to with DOJ. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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<sup>2</sup> See [REDACTED] (“Second Request”).

<sup>3</sup> Exhibit A hereto provides a list of the custodians with their priority/non-priority designation and whether each is a key custodian for the purpose of certain Specifications. In addition, as discussed with the FCC Transaction Team, the Document Production will also contain the responsive documents of an additional custodian designated “Added” on Attachment A.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

T-Mobile has provided a Bates range of documents for certain targeted requests. For requests for “all documents” or where similar language is used, T-Mobile has referenced the general Document Production.

1. ***Provide a current organization chart and personnel directory for the Company as a whole and for each of the Company’s facilities or divisions involved in any activity relating to any Relevant Product or Relevant Service in any Relevant Area.***

T-Mobile provided information responsive to Specification 1 in a filing on July 27, 2018.<sup>5</sup>

2. ***Provide full and complete copies of the merger agreement and any side or letter agreements or other related agreements (and all amendments and attachments thereto) that T-Mobile and Sprint have entered into that relate to the Proposed Transaction, including the Proxy, Lock-up and Right of First Refusal Agreement (Proxy Agreement) between Deutsche Telekom and SoftBank, and any side or letter agreements or other agreements (and all amendments and attachments thereto) related to the Proxy Agreement, which the Applicants state will be executed prior to closing. In addition, provide all documents discussing the Proposed Transaction (except those discussing solely environmental, tax, human resources, OSHA, or ERISA issues), including, but not limited to:***
  - a. ***all presentations to management committees, executive committees, boards of directors, investors, investor analysts, and industry analysts concerning the***

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<sup>4</sup> The smaller production would include certain documents withheld pending redaction and documents where, upon further review, privilege has been downgraded.

<sup>5</sup> Letter from Nancy J. Victory, Counsel to T-Mobile US, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket 18-197 (July 27, 2018).

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***Proposed Transaction, including, but not limited to, the effect of the Proposed Transaction on T-Mobile’s spectrum needs and business plans;***

Copies of the merger agreement and any side or letter agreements or other related agreements have been provided in the Document Production in Bates ranges TMUS-FCC-02508420 to TMUS-FCC-02508937, TMUS-FCC-02508956 to TMUS-FCC-02509267, TMUS-FCC-02509268 to TMUS-FCC-02509287, TMUS-FCC-02509288 to TMUS-FCC-02509303, and TMUS-FCC-02509304 to TMUS-FCC-02509332.<sup>6</sup> Additional documents responsive to *Specification 2a* are in the Document Production.<sup>7</sup>

- b. all plans for changes in the Company’s operations, structure, policies, strategies, product and service offerings, corporate goals, financing, business, officers, employees, or any other area of corporate activity as a result of the Proposed Transaction;***

Documents responsive to *Specification 2b* are in the Document Production.

- c. any documents containing other terms or conditions of the Proposed Transaction that were considered, but are not reflected in the merger agreement between the parties or in the other documents supplied in response to this Request;***

Documents responsive to *Specification 2c* are in the Document Production, although many of the referenced documents are subject to legal privilege.

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<sup>6</sup> Pursuant to discussions with the FCC Transaction Team, disclosure schedules have been omitted.

<sup>7</sup> Pursuant to discussions with the FCC Transaction Team, “management committees” and “executive committees” have been limited to committees of the T-Mobile Board of Directors and executive officers.

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- d. documents containing all terms and conditions applicable if the Proposed Transaction is not consummated;*

All terms and conditions if the Proposed Transaction is not consummation are contained within the Business Combination Agreement (“Agreement”) and related agreements provided in response to *Specification 2a*.

- e. a timetable for the Proposed Transaction, including when it was first proposed, when the parties came to an agreement, and the actions that must be taken prior to consummation; and*

While business combinations between T-Mobile and Sprint Corporation (“Sprint”) have been discussed, and abandoned, in the past, the present transaction was originally proposed in late January and early February of 2018. At that time, representatives of Sprint and SoftBank Group Corp. (“Softbank”) and representatives of T-Mobile and DT again discussed the possibility of re-engaging in discussions regarding a possible business combination between Sprint and T-Mobile.<sup>8</sup>

On April 29, 2018, the parties ultimately signed the Agreement by and among T-Mobile; DT (and its wholly-owned subsidiary, Deutsche Telekom Holding B.V.); Huron Merger Sub LLC (“Huron”), a wholly-owned subsidiary of T-Mobile; Superior Merger Sub Corporation (“Superior”), a wholly-owned subsidiary of Huron; Sprint; and SoftBank (and its wholly-owned subsidiaries, Starburst I, Inc. (“Starburst”) and Galaxy Investment Holdings, Inc. (“Galaxy”)). Pursuant to the Agreement, T-Mobile proposes to acquire Sprint in an all-stock transaction (the “Transaction”). The Transaction will be completed in the following manner: (i) SoftBank

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<sup>8</sup> For a timeline of discussions prior to that time, see Form S-4 Registration Statement of T-Mobile US, Inc. (July 30, 2018) at 62-67.

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subsidiaries, Galaxy and Starburst, which currently collectively own approximately 84 percent of Sprint, will merge with and into Huron, with Huron continuing as the surviving corporation; (ii) Superior will merge with and into Sprint, with Sprint continuing as the surviving entity;<sup>9</sup> (iii) Huron will distribute Sprint stock to T-Mobile, which (iv) T-Mobile will then contribute to its direct subsidiary, T-Mobile USA, Inc. (“T-Mobile USA”). Following completion of these steps, Sprint will be a wholly owned subsidiary of T-Mobile USA. DT and SoftBank are expected to hold approximately 42 percent and 27 percent of the fully diluted shares of T-Mobile Common Stock, respectively, with the remaining approximately 31 percent of the fully diluted shares of T-Mobile Common Stock held by public stockholders.

The Transaction is subject to the Conditions Precedent outlined in Article VII of the Agreement. These Conditions Precedent include:

1. ***Stockholder approvals.*** Approval of the Transaction by the stockholders of T-Mobile and Sprint.
2. ***Required Regulatory Consents.***
  - a. Expiration of the waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended (the “HSR Act”); and
  - b. Receipt of all consents required to be obtained from the FCC for the transfer of control to T-Mobile of various FCC licenses and authorizations.
3. ***Other Governmental Consents.***
  - a. Receipt of all consents required to be obtained from any public utilities commissions or similar state regulatory body;<sup>10</sup>

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<sup>9</sup> If the first step above does not occur because the conditions precedent are not met, Sprint shares held by Galaxy and Starburst will be converted into T-Mobile shares in this step.

<sup>10</sup> Filings have been made with the public utilities commissions in Alaska, California, Colorado, Delaware, the District of Columbia, Georgia, Hawaii, Louisiana, Maryland, Minnesota,



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- b. Completion of review by the Committee on Foreign Investment in the United States (“CFIUS”) and, where applicable, investigation without unresolved national security concerns; and
- c. If the Defense Security Service determines necessary, approval from the Defense Security Service of a plan for T-Mobile to comply with the National Industrial Security Program Operating Manual.

In connection with these regulatory obligations, Sprint and T-Mobile must take the actions described in Table 2e-1:

**Table 2e-1: Regulatory Obligations**

Regulatory Body	Summary	Date
Department of Justice	File Premerger Notification and Report Forms	May 24, 2018
	Respond to Second Request and observe relevant waiting period	[REDACTED]
Federal Communications Commission	File license transfer applications, Public Interest Statement, and petition for declaratory ruling	June 18, 2018
	Respond to any petitions to deny filed by third parties	FCC Public Notice issued on July 18, 2018; petitions to deny due August 27, 2018; Applicants’ Opposition due September 17, 2018; replies from petitioners due October 9, 2018
	Respond to FCC information request(s)	FCC <i>Information Request</i> issued on August 15, 2018, with response due September 5, 2018.

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Mississippi, Nevada, New Jersey, New York, Pennsylvania, Texas, Utah, Virginia, and West Virginia.

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Regulatory Body	Summary	Date
	Respond to Team Telecom information request(s)	Information request response deadlines and Team Telecom review timelines vary
CFIUS	Submit formal notice, beginning 75-day review period	[REDACTED]
Defense Security Service	Submit response to SF-328 questionnaire	[REDACTED]
State and Local Public Utilities Commissions	A number of states require that the Parties receive prior approval for the transfer of Sprint’s competitive local exchange carrier (“CLEC”) authorizations	Prior-approval applications and pre-closing notices have been filed in 18 states and Washington, D.C.

No international merger control or other regulatory filings or approvals are required prior to closing. Other conditions precedent to closing the Transaction are described in Article VII of the Agreement.

The Parties anticipate closing the Transaction as soon as practicable, and in any event within three business days of the satisfaction or waiver of all closing conditions specified in the Agreement, subject to the Marketing Period defined in the Agreement.<sup>11</sup>

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<sup>11</sup> “Marketing Period” refers to the first period of twenty consecutive business days throughout and at the end of which (i) T-Mobile has received certain required financial information regarding Sprint and its subsidiaries and (ii) the conditions to the parties’ obligations to effect the Transaction in sections 7.1 and 7.2 of the Agreement (other than those conditions that by their terms are to be satisfied at the closing) are satisfied. The Agreement specifies certain days that will be excluded as a business day for purposes of determining the Marketing Period and certain additional requirements with respect to the start and end dates of the Marketing Period.

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- f. provide all documents since January 1, 2012 related to: (i) the reasons that any previously contemplated transaction between T-Mobile and Sprint, and any other plans for acquisition, divestiture, joint venture, alliance, or merger other than the Proposed Transaction were discontinued, abandoned, or otherwise not consummated; (ii) prospects for, approaches to, or analyses of the regulatory approvals required for any such transaction; and (iii) changes in the Company's operations, policies, strategies, product offerings, corporate goals, or financing as a result of each such discontinuation, abandonment, or non-consummation.*

Documents responsive to *Specification 2f* are in the Document Production. Pursuant to discussions with the FCC Transaction Team, the Document Production will only include documents from the custodians designated as “Key” in Appendix A for dates prior to January 1, 2015.

- 3. Provide a list of all databases or datasets used or maintained by the Company that constitute, record, or discuss: (a) discount or promotional requests or approvals; (b) sales personnel call reports; (c) meeting competition requests or approvals; (d) win/loss reports; (e) prices, quotes, estimates, or bids submitted to any customer; (f) the results of any bid or quote submitted to any customer or prospective customer; (g) customer relationship databases; (h) products and product codes; (i) facilities; (j) production; (k) sales; (l) prices; (m) margins; (n) costs, including production costs, development costs, distribution costs, standard costs, expected costs, and opportunity costs; (o) patents or other intellectual property; (p) research or development projects, including expenditures and significant accomplishments.*

Pursuant to discussions with the FCC Transaction Team, T-Mobile has provided as Exhibit B a list of the databases that are being provided to DOJ or being considered to be provided to DOJ.

- 4. Provide, as of the date of this request, a csv format list, by county or county equivalent, of each spectrum license that can be used in the provision of mobile wireless services that the Company holds, leases, has an interest in through a joint venture or other business arrangement, manages, has contracted to acquire, or is in negotiations to acquire. For each license, identify the: (a) FIPS Code; (b) county; (c) state; (d) market name; (e) market number (e.g., BTA, CMA, PEA); (f) spectrum type; (g) spectrum block; (h) amount of spectrum; (i) the wireless technology format deployed or planned (e.g., GSM, CDMA, EV-DO Rev. A, UMTS, HSPA, HSPA+, LTE, VoLTE, 5G); and (j) whether the Company: (i) holds; (ii) has an interest in through a joint venture or other*

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*business arrangement; (iii) leases to or from another person; (iv) manages; (v) has contracted to acquire; or (vi) is in negotiations to acquire.*

T-Mobile has provided the requested information as “Specification 4 Spectrum.csv” contained on the Engineering USB drive. The data table provides columns for each of the requested elements and, given that the Specification seeks information on a per-license basis, also includes columns for FCC call sign and the licensee name. Pursuant to discussions with the FCC Transaction Team: (i) “in negotiation” has been interpreted to mean proposed transactions that have reached the point where the parties have exchanged term sheets or contracts and (ii) the “as of” date has been modified to coincide with the date of the data used in the spectrum exhibits provided to the FCC as Attachments L and M to the Public Interest Statement (“PIS”).<sup>12</sup>

5. *In seeking approval to acquire MetroPCS, T-Mobile claimed that the proposed combination would allow the combined company to realize significant projected network synergies generating savings of approximately \$5-6 billion on a net present value basis, and that these synergies would come from rationalization of T-Mobile’s and MetroPCS’s LTE networks into a single network, decommissioning of overlapping cell sites, the eventual decommissioning of MetroPCS’s CDMA/EV-DO network, elimination of overlapping functions, and reduction in duplicative network-based capital expenditures. In the context of the current Proposed Transaction, the Applicants assert that the T-Mobile team was able to migrate 70 percent of the MetroPCS subscribers within 15 months and complete the full migration within 26 months. (Public Interest Statement, page 40, citing Ray Declaration, para. 71). The Applicants claim that T-Mobile realized the estimated synergies a year ahead of schedule and achieved 40 percent higher synergies than planned. (Public Interest Statement, pages 40-41, citing Ray Declaration, para. 71). Provide a detailed discussion:*
- a. *identifying and quantifying the synergies that were realized a year ahead of schedule, including a detailed discussion of what steps and actions led to this outcome;*
  - b. *specifically identifying and quantifying the synergies that allowed T-Mobile to achieve 40 percent higher synergies than planned in connection with its*

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<sup>12</sup> Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign Licenses, ULS File No. 0008224209, WT Docket No. No. 18-197 (June 18, 2018).

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*combination with MetroPCS, including a detailed discussion of what steps and actions led to this result; and*

*c. provide all documents discussing and/or detailing both of these results.*

Documents responsive to *Specification 5c* have been provided in the Document Production.

With respect to *Specifications 5a-b*, T-Mobile completed its merger with MetroPCS on April 30, 2013. At the time, T-Mobile projected that it would achieve \$6-7 billion in synergies, but the Company ultimately achieved synergies of approximately \$9-10 billion, about 34-49 percent greater than the initial projection. As explained in more detail below, these synergies came from integrating the two networks, non-network cost synergies, and benefits from the provision of higher quality services to both T-Mobile and MetroPCS customers and the expanded geographic reach of MetroPCS. The work undertaken to achieve these synergies provided valuable experience to the integration team that will be responsible for achieving synergies for the Transaction.

In the MetroPCS acquisition business case, T-Mobile projected that it would realize \$5.4 billion in net present value (“NPV”) network synergies by: (i) transitioning MetroPCS customers onto new, T-Mobile network compatible handsets, facilitating the transition away from MetroPCS’s outdated CDMA network (while MetroPCS maintained a very thin LTE network, its principal platform was its CDMA network); (ii) reducing overlapping network assets, as well as operating expenses, including those related to towers, backhaul, and roaming; (iii) driving economies of scale and lowering per unit costs through increased utilization of T-Mobile’s network; and (iv) expedited spectrum refarming. T-Mobile also projected that the transaction

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would enable approximately \$1 billion in NPV non-network synergies from: (i) purchasing cost reductions; (ii) common platform efficiencies; and (iii) administrative savings.

T-Mobile projected that the transaction would enable improved services by (i) providing MetroPCS customers access to T-Mobile's 4G nationwide HSPA+ and LTE network; (ii) enabling broader, deeper and faster roll-out of LTE; (iii) allowing expansion of the MetroPCS brand and business model in major metropolitan areas; (iv) improving coverage, speed, and service quality to the joint customer base by combining complementary network and spectrum assets; and (v) offering broader handset selection at lower prices.

T-Mobile achieved \$1.5 billion in NPV cost-savings one year ahead of schedule, and ultimately achieved synergies of \$9-10 billion, or \$2.5-3.5 billion more than originally predicted.

*Network synergies.* Prior to the transaction, MetroPCS was primarily operating on older generation technology (CDMA) and a very thin spectrum allocation in light of the concentrated customer base. As part of the post-merger integration, T-Mobile began transitioning MetroPCS customers to handsets that were compatible with T-Mobile's HSPA+ and LTE networks through sales efforts at expanded retail outlets. Notwithstanding that only 42 percent of the MetroPCS handsets (3.7 million) were LTE capable at the close of the merger, T-Mobile completed the transition away from outdated CDMA equipment, added more than [REDACTED] sites of 700 MHz spectrum in parallel, and migrated MetroPCS customers to the new network in 26 months.

The transition away from the CDMA network permitted the company to quickly reform spectrum to provide higher quality services across the network. These moves, in conjunction with the decommissioning of certain overlapping MetroPCS network assets [REDACTED] MetroPCS sites were decommissioned), allowed the Company to improve its cost position, while simultaneously spreading the remaining costs across a broader user base. Ultimately, the

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transaction enabled economies of scale through higher utilization of T-Mobile's network and lower per-unit costs for the Company.

The Company began selling T-Mobile-compatible devices to MetroPCS customers in the second quarter of 2013 through MetroPCS-branded distribution points and by the end of the year had already transitioned more than 3.5 million new and existing MetroPCS customers to the T-Mobile network. At the end of the third quarter of 2014, 78 percent of the total MetroPCS customer base was already on the T-Mobile network.

By the end of 2013, only nine months after the transaction had closed, T-Mobile had refarmed more than 25 percent of MetroPCS spectrum to LTE. More than 50 percent of the MetroPCS spectrum had been refarmed and integrated into the T-Mobile network at the end of the first quarter of 2014. By the end of the second quarter of 2015, T-Mobile had completed the refarming of MetroPCS spectrum to LTE. *See* TMUS-FCC-00788654 to TMUS-FCC-00788655. Network integration was completed a full six months ahead of schedule.

The network projections predicted that [REDACTED] MetroPCS cell sites would be decommissioned and the others retained as part of an effort to improve cell coverage and maintain capacity. The Company ultimately decommissioned only [REDACTED], and retained [REDACTED] cell sites in order to improve customer service. The decommissioned sites eliminated redundant and costly network infrastructure. The result was a substantial reduction in operating expenses. For example, the elimination of MetroPCS site costs saved the Company [REDACTED] in 2014 and T-Mobile believes it exceeded the projected saving of [REDACTED] in 2015 and [REDACTED] in each of 2016 and 2017.

T-Mobile used the transition away from MetroPCS's CDMA network to facilitate the realization of the network synergies. On July 7, 2014, T-Mobile transitioned away from the first

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three MetroPCS CDMA networks in Boston, Hartford, and Las Vegas—all while ensuring a seamless transition for its customers. By 2015, the Company had completed eight market transitions. On July 1, 2015, T-Mobile decommissioned the CDMA portion of the MetroPCS networks in Dallas, New York, Miami, and the remaining Florida markets, officially completing the transition of the MetroPCS CDMA network. *See* TMUS-FCC-01676125.

Because of the accelerated integration pace, the Company realized the full run-rate network synergies by 2016, a year ahead of schedule. While the Company predicted \$5-6 billion in NPV network synergies, it actually achieved an estimated [REDACTED].

***Non-network synergies.*** The Company also successfully achieved non-network synergies, primarily from reductions in device costs, but also from reduced administrative costs, for example non-engineering personnel and labor costs. Synergies related to device purchases reflect the cost advantage of T-Mobile compatible GSM devices over MetroPCS CDMA devices.

Non-network synergies also exceeded expectations. The Company predicted approximately \$1 billion in NPV non-network synergies, and it actually achieved approximately [REDACTED].

***Benefits of transaction synergies.*** The Company was spectacularly successful in its efforts to leverage the synergies described above. Because T-Mobile achieved broader, better coverage, a 300 percent increase in covered POPs, and speeds approximately 10.5 times higher as a result of combining MetroPCS with T-Mobile's LTE network, it was able to greatly expand the MetroPCS customer base.

The Company's efforts to upgrade the MetroPCS user experience paid off. MetroPCS customers quickly experienced substantially better services after being onboarded to T-Mobile's network, including speeds that were on average seven times faster than those previously



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available. Customers who moved to T-Mobile’s LTE network in particular experienced speeds that were over ten times faster than those previously available. Additionally, the MetroPCS brand expanded its 4G smartphone portfolio, giving customers increased choice of handset and expanding the “bring your own handset” policy.

The Company was able to improve services and expand available capacity to MetroPCS customers while keeping nominal prices relatively flat. Put another way, MetroPCS customers received far more for their money as a result of the merger—for example, since the MetroPCS merger, the \$40/mo. plan offers approximately ten times the amount of data for the same price. This demonstrates that the synergies created by the transaction were passed on to the consumer.

The Company also invested substantial capital in an effort to reach more consumers. On July 25, 2013, the Company announced the strategic expansion of the MetroPCS brand to 15 new geographies. Within about four months, the Company had already launched more than [REDACTED] MetroPCS distribution points in these new areas. By the end of 2013, MetroPCS had expanded into a total of 30 new geographies with more than [REDACTED] new distribution points. By September 30, 2014, MetroPCS covered 40 new geographies with [REDACTED] new points of distribution.

As a result of these efforts and the improved network, T-Mobile nearly doubled the MetroPCS customer base from 9 million to 18 million within approximately four and a half years of closing the transaction. T-Mobile achieved [REDACTED] the customer growth rate of standalone MetroPCS and reduced churn from [REDACTED]. Table 5-1 lists some of the highlights of the integration effort.



*Costs to achieve synergies.* T-Mobile spent [REDACTED] in 2013, [REDACTED] in 2014, [REDACTED] in 2015, [REDACTED] in 2016, and [REDACTED] in 2017 on one-time network costs associated with the integration. Total network integration costs amounted to [REDACTED] approximately [REDACTED] lower than the projected total of [REDACTED].

T-Mobile spent [REDACTED] in 2013 and [REDACTED] in 2014 on one-time non-network costs associated with the integration. Total non-network integration costs amounted to [REDACTED], far lower than the [REDACTED] the Company initially projected. The reduced costs reflect the speedy, efficient, and successful integration of MetroPCS.

**6. *The Applicants claim that the Proposed Transaction will generate cost savings “of approximately \$43.6 billion total net present value cost synergies by 2024,” and that “T-Mobile will use these synergies to invest nearly \$40 billion to bring the combined company into the 5G era.” (Public Interest Statement, pages 15, 120; Ewens Declaration, paras. 7, 12). For all business, network, or other efficiencies, including operational savings, cost synergies, or quality improvements, claimed to result from the Proposed Transaction, provide:***

**a. *identification of the efficiency and quantification of that efficiency in terms of total benefits and benefits to consumers of a Relevant Product or Relevant Service (i.e., pass-through), in any Relevant Area, separately for each year from 2018 through 2024;***

The Company anticipates substantial benefits to result from the Transaction, creating \$43.6 billion in synergies, net present value. Those synergies are driven by the combination of unique assets, most prominently T-Mobile’s and Sprint’s complementary spectrum assets and

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networks. Through cost savings and the investment of approximately \$40 billion in the business and network during the first three years post-closing, the combination will allow New T-Mobile to rapidly deploy the first truly nationwide 5G network and deliver a massive expansion of capacity with which New T-Mobile will continue providing consumer benefits in accordance with the Un-carrier model. Indeed, by 2024, New T-Mobile's network will have twice as much total capacity compared to the sum of the parties' standalone plans and will have sector throughputs 4-6x as compared to the standalone plans.

T-Mobile's most recent financial model quantifying the synergies from the Transaction is included in the Document Production as TMUS-FCC-02505996. Yearly breakdowns for each of the efficiencies and cost-savings are provided within the spreadsheet. Below is a summary of the primary categories of cost savings only:

- ***Integration & Site Expense:*** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] from forgoing network operating expenditures that Sprint and T-Mobile would have incurred as standalone companies. The Company estimates that these savings will be worth [REDACTED] in net present value, after and including an expected [REDACTED] in spending to achieve this benefit, net of [REDACTED] in avoided capex.
- ***Network Capital Expenditure Savings:*** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] from forgoing network capital expenditures that Sprint and T-Mobile would have incurred as standalone companies. The Company estimates that these savings will be worth [REDACTED] in net present value. The Company does not expect this benefit to require any spending to achieve.
- ***Retail Distribution:*** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] from efficiencies related to retail distribution. The Company estimates that these savings will be worth [REDACTED] in net present value. The Company expects this benefit will require [REDACTED] in spending to achieve.
- ***Advertising:*** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] from forgoing advertising expenses that Sprint and T-Mobile would have incurred as standalone companies. The Company estimates

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that these savings will be worth [REDACTED] in net present value. The Company does not expect this benefit to require any spending to achieve.

- **Customer Care:** The Company plans for New T-Mobile to increase its spending on customer care as a result of the Transaction, in order to maintain and extend to Sprint customers T-Mobile's leading and award-winning customer care. The Company expects this increase in customer service quality will require an additional [REDACTED] per year in spending, which reduces the net present value efficiencies created by the transaction by [REDACTED].
- **Equipment Costs:** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] through lower equipment costs compared to Sprint and T-Mobile as standalone companies. The Company estimates that these savings will be worth [REDACTED] in net present value. The Company does not expect this benefit to require any spending to achieve.
- **Repair & Logistics:** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] on repair and logistics costs compared to what T-Mobile and Sprint would spend as standalone companies. The Company estimates that these savings will be worth [REDACTED] in net present value. The Company does not expect this benefit to require any spending to achieve.
- **IT & Billing:** The Company expects New T-Mobile to achieve yearly run rate savings of [REDACTED] through the integration of Sprint's and T-Mobile's IT and billing systems. The Company estimates that these savings will be worth [REDACTED] in net present value. The Company expects this benefit to require [REDACTED] in costs to achieve.
- **Other fixed G&A:** New T-Mobile expects to achieve yearly run rate savings of [REDACTED] from the integration of Sprint's and T-Mobile's general and administrative systems. The Company estimates that these savings will be worth [REDACTED] in net present value. This benefit is expected to require [REDACTED] in integration spending to achieve.

The greatest quality improvements result from the combination of the parties' spectrum portfolios and networks, and in particular the deployment of a broad and deep nationwide 5G network, which will allow the Company to compete in multiple new lines of business.

Additionally, efficiencies across the board will result in increased investment in core services.

Customer-facing improvements will also be obvious in several operational areas described

below:

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- **Network Improvements.** The Transaction will enable New T-Mobile to offer a significantly improved network when compared to the networks that standalone T-Mobile or Sprint could develop. Most significantly, New T-Mobile expects to deliver a 5G network more quickly and on a broader and deeper basis than either T-Mobile or Sprint could. The combined entity will have a robust network of low-, mid-, and high-band spectrum, and this spectrum, combined with an expanded network of cell sites, will enable New T-Mobile dramatically to increase capacity and reduce costs. Even while New T-Mobile is in the process of developing its nationwide 5G network, consumers will experience significant improvements in coverage and capacity. In particular, New T-Mobile will optimize use of the parties' existing sites and LTE spectrum resources to provide an enhanced LTE offering, while simultaneously freeing up extensive spectrum resources for 5G. This will reduce the need to split resources between LTE and 5G, as the parties must do under their standalone plans, which limits the performance of both technologies.
  - **Retail Distribution.** New T-Mobile will combine and optimize the retail distribution for the postpaid products of T-Mobile and Sprint to create a significantly improved nationwide retail footprint. New T-Mobile will accomplish this benefit through (i) consolidating stores—*i.e.*, retaining the best Sprint locations and rationalizing overlapping stores, (ii) opening new stores, (iii) refreshing existing stores including rebranding legacy Sprint stores, and (iv) offering a better value proposition to retained dealers as a result of an anticipated increase in the volume of kits—*i.e.*, acquisitions or upgrades of handsets—sold.
  - **Customer Care.** Continuing the Un-carrier's legacy, New T-Mobile will maintain T-Mobile's industry-leading customer care. This commitment will require the elevation of Sprint's lagging care operations to T-Mobile standards. Sprint currently uses automated systems to handle many of its customer care calls, and most of its live-handled calls are off-shored. New T-Mobile will transition these Sprint customers to T-Mobile's award-winning Team of Experts Customer Care model, in which all calls are live-handled and the majority are handled on-shore. New T-Mobile will invest [REDACTED] in additional annual costs to improve customer care for Sprint customers.
  - **Equipment Cost.** New T-Mobile's significantly larger scale will provide it with more bargaining leverage with handset suppliers. As a result, New T-Mobile will achieve significant variable cost savings in handset costs.
- b. **for each cost savings claimed from the Proposed Transaction, state separately for each year from 2018 through 2024, the one-time fixed cost savings, recurring fixed cost savings, and variable cost savings in dollars per subscriber, dollars per year, as a percentage decrease of the current cost base (fixed,**

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*recurring, and variable), and separately as a percentage reduction of current costs as a whole;*

The referenced data can be found in the Build 9 Spreadsheet TMUS-FCC-02505996.

- c. all documents related to the ability of New T-Mobile to achieve that efficiency, the ability of Sprint and T-Mobile to achieve that efficiency without the Proposed Transaction, and the benefits likely to arise from that efficiency for consumers of any Relevant Product or Relevant Service in any Relevant Area;*

Documents responsive to *Specification 6c* are in the Document Production.

- d. a detailed explanation of how the benefits from that efficiency can be independently verified, with: (i) identification of the record documents relevant to its verification; (ii) identification of the record documents relevant to the factual or numeric inputs in its quantification; and (iii) identification of the record documents relevant to the validation of any material assumptions in its quantification;*

The anticipated benefits were quantified and analyzed by the T-Mobile Corporate Strategy & Analysis (“CS&A”) team, culminating in the production of Build 9.<sup>13</sup> The CS&A team worked collaboratively to develop the “Builds” (financial models, together with the Jobs model referenced by T-Mobile as “Business Plans”) evaluating and estimating the financial impact of the Transaction, including estimating the benefits of the Transaction and the costs to achieve those benefits. This core team received input from T-Mobile’s senior leadership team and various other T-Mobile teams, including the network team, on the key assumptions that went into the model.

The CS&A team started work on the New T-Mobile Business Plan in the summer of 2017, when T-Mobile and Sprint were in discussions about a possible combination (“Project Nations”) that were later terminated. When merger discussions resumed in the spring of 2018 (“Project Lakes”), the CS&A team worked to create a new version of the Business Plan,

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<sup>13</sup> TMUS-FCC-02505996.

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including a new version of the financial model on an accelerated timeline. Further refinements of the financial model translated into iterative Builds. Build 9 is the most recent version of the financial model.

The iterative Builds incorporated as much information as was available at the time they were constructed. The two primary inputs into the financial model are (1) the Company's 2017 Long Range Plan (the "LRP," including LRP Model, LRP Debt Model, and LRP BS Model) with modifications implemented by the Financial Planning & Analysis ("FP&A") team in the fall of 2017 and early 2018 and (2) a construction of Sprint's standalone business plan using a combination of average analyst projections, Sprint's management plans, and adjustments by T-Mobile's management based on their business judgment. Given the accelerated timeline of Project Lakes and the limitations on information that could be obtained from Sprint throughout the modeling process, the model necessarily includes certain high-level assumptions. Where possible, the Company informed these assumptions with third-party sources, the Company's experience gained from the MetroPCS acquisition and migration, and the senior leadership team's substantial experience in the industry.

To date, the Company is not aware of any new information that would substantially change the estimates of the core transaction benefits. The Company continues to monitor its ongoing performance, that of Sprint, and any changes in the wireless marketplace to determine if they warrant any updates to Build 9. The Company may also adjust parameters for Enterprise projections to better conform to any changes in its own B2B plan. These changes are not expected to materially alter the core Transaction benefits.

The CS&A team built the financial models for the purpose of providing an estimate of the potential benefits and financing capability of the Transaction necessary for board approvals

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and presentation to the rating agencies. While Build 9 contains operational drivers and financial estimates for key functional areas of the New T-Mobile business, the financial envelopes included in Build 9 will likely be refined into operational forecasts as part of the New T-Mobile integration process.

- e. all workpapers, model runs, and other calculations used to derive the cost synergies figure of \$43.6 billion;*

Documents responsive to *Specification 6e* are in the Document Production.

- f. all documents or information related to cost savings or synergies achieved through partnerships or agreements with foreign equipment vendors; and*

Documents responsive to *Specification 6f* are in the Document Production.

- g. all other documents, to the extent not already provided, discussing potential efficiencies from the Proposed Transaction.*

Documents responsive to *Specification 6g* are in the Document Production.

- 7. *For T-Mobile and New T-Mobile, provide separately, for the United States and the Commonwealth of Puerto Rico, for 2018, the per cell site average CAPEX and OPEX for a new build, as well as the average cost of upgrading, collocating, or decommissioning a site. Provide all assumptions and methodological calculations used to generate the per site average cost estimates for T-Mobile and projected average cost estimates for New T-Mobile. The data should be provided on the following basis:*

- a. whether the site is a macrocell, microcell, picocell, or distributed antenna system;*
- b. whether the site is rural, suburban, or urban; and*
- c. whether the site will implement a 5G, LTE, or lower generation technology.*

Data responsive to *Specification 7* has been provided on the Engineering USB drive as “Specification 7 Site Data.xlsx.” T-Mobile does not maintain classifications of sites as “rural,” “suburban,” or “urban” in the ordinary course of business and has used best efforts to create such classifications based on the data available.



8. *For T-Mobile’s acquisition of 600 MHz and 700 MHz spectrum since January 1, 2012, whether via auction or via a secondary market transaction with a third party:*

a. *provide a list of all the competitive benefits projected to be achieved as a result of the proposed acquisition;*

The principal competitive benefit expected to be achieved in T-Mobile’s low band spectrum acquisitions since 2012 was to improve T-Mobile’s poor coverage breadth—the only significant acquisition being participation in the 600 MHz auction.<sup>14</sup> T-Mobile projected that once T-Mobile secured strong nationwide coverage, SoGA and churn would improve and the Company could use the related cost efficiencies to pursue further network investments, including even deeper coverage and increased capacity.

With respect to the acquisition of 600 MHz spectrum at auction, in February 2016, T-Mobile expected the net present value of benefits of its 2017 acquisition of 600 MHz spectrum to be nearly [REDACTED] overall at a cost of [REDACTED] (including the \$8.3 billion auction spend). Those synergies would come from four areas: (1) increased gross adds due to increased sellable footprint and coverage experience; (2) decreased churn due to improved coverage reliability, especially improved in-building coverage, which would limit the churn risk for newly acquired customers with high coverage expectations; (3) increased ARPU due to consumers taking higher end rate plans due to the improved coverage reliability and improved footprint; and (4) non-network benefits. Table 8(a)-1 summarizes the estimated values of these four improvements.

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<sup>14</sup> On April 30, 2013, T-Mobile completed its merger with MetroPCS. While that transaction involved one MetroPCS license for 700 MHz spectrum, that low band license was not integral to the merger and, in any event, the synergies associated with that transaction are discussed extensively in response to *Specification 5*.

Table 8(a)-1: Estimated 600 MHz Benefits

Synergy	Net Present Value of Benefits	Description
Improved Gross Adds	██████████	Postpaid gross adds increased by ██████████ points
Decreased Churn	██████████	Postpaid churn decreased by ██████████ points
Increased ARPU Due to Network Improvement	██████████	Substantial improvement in capacity and coverage, particularly in rural areas and in-building
Non-Network Benefits	██████████	Spectrum tax amortization and impact of other confounding variables
<b>TOTAL</b>	██████████	

***b. provide a list of all the competitive benefits achieved to date following such acquisitions of 600 MHz and/or 700 MHz spectrum;***

In April 2017, T-Mobile spent \$8.3 billion to acquire 1,525 licenses (31 MHz on average nationwide) of 600 MHz spectrum in the FCC incentive auction. T-Mobile participated in the auction because, at the time, it had only 8 MHz of low-band spectrum spread out over 25 of the top 30 regions, and it was not distributed evenly—211 million POPs had access to 12 MHz, while 110 million POPs had access to none. T-Mobile identified eliminating this gap and securing nationwide low-band spectrum as “critical to eliminating network experience as a dis-qualifier for customers considering T-Mobile.”

Where the 600 MHz spectrum is not currently in use by broadcasters, T-Mobile compressed a normally two-year process from auction to consumer availability into only six months. The Company started rolling out Extended Range LTE on the acquired spectrum in August 2017, and by the end of 2017, T-Mobile had deployed Extended Range LTE on 600 MHz

in 586 cities and towns in 28 states, covering over 300,000 square miles.<sup>15</sup> By August 1, 2018, T-Mobile had rolled out Extended Range LTE in over 950 cities and towns across 33 states.<sup>16</sup> Extended Range LTE signals reach twice as far and penetrate walls more efficiently, resulting in coverage that is four times better than standard LTE. T-Mobile has also taken steps, such as allowing early upgrades, which will have increased 600 MHz-capable<sup>17</sup> device penetration to [REDACTED] by the end of 2018. Also by the end of 2018, [REDACTED] of new phones sold by T-Mobile will support the 600 MHz band. As described in the Company's response to *Specification 5*, similar methods were very successful in rapidly transitioning the acquired MetroPCS spectrum.

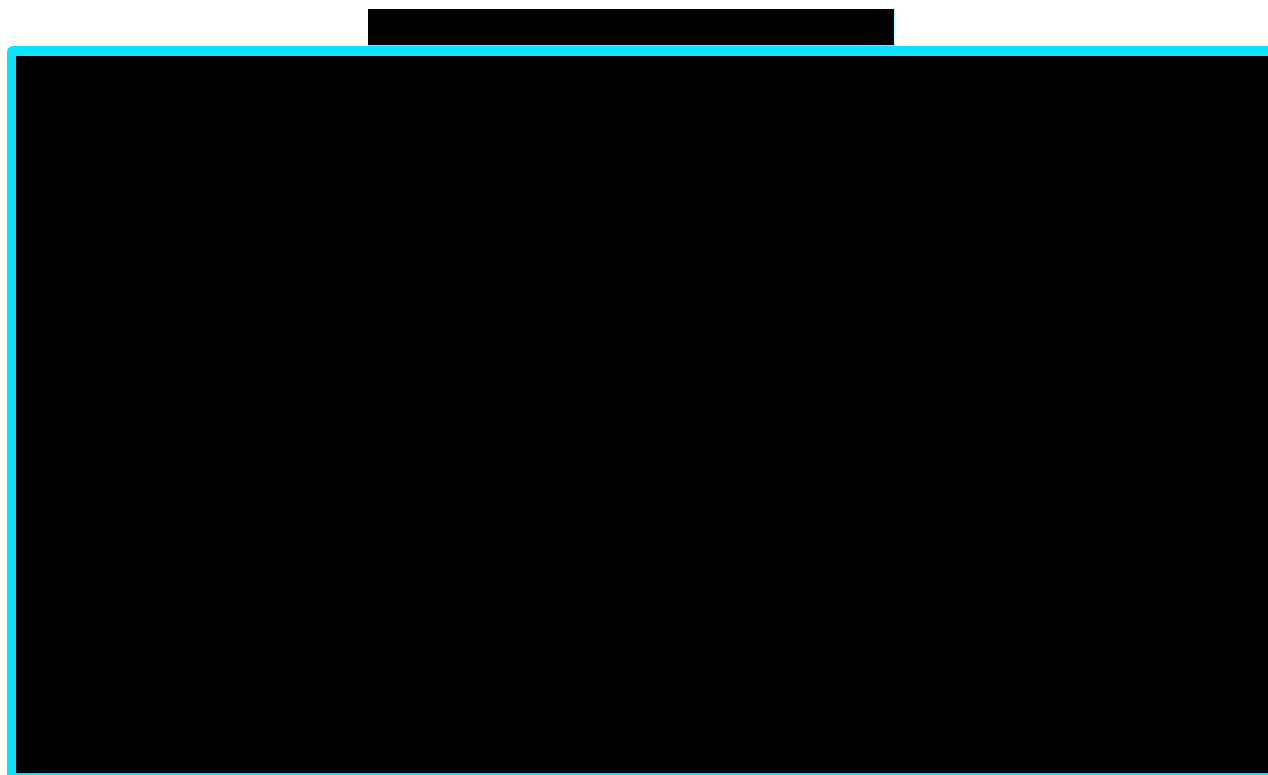
Figure 8(b)-2, below, demonstrates T-Mobile's plans to maximize the benefits of 600 MHz deployment.

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<sup>15</sup> T-Mobile, 2017 Annual Report (Form 10-K) at 6.

<sup>16</sup> T-Mobile Earnings Release, Aug. 1, 2018, at 5.

<sup>17</sup> Because 600 MHz was previously not used for wireless communications, not all cell phones are capable of using the spectrum. However, industry commentators expect 600 MHz support to become "a common feature in new phones." Jon Brodtkin, *New T-Mobile Upgrade May Boost Your Coverage—If You Have the Right Phone*, ArsTechnica (June 7, 2018), <https://arstechnica.com/information-technology/2018/06/new-t-mobile-upgrade-may-boost-your-coverage-if-you-have-the-right-phone>.



In addition, since rolling out Extended Range LTE on 600 MHz spectrum, T-Mobile has opened over 350 new T-Mobile- and MetroPCS-branded retail stores serving areas where it added 600 MHz coverage.<sup>18</sup>

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<sup>18</sup> The new store estimate was derived by first identifying all T-Mobile and MetroPCS stores opened after T-Mobile rolled out extended range 600 MHz coverage in August of 2017, and then identifying which of those new stores were potentially serving the needs of consumers in with extended range 600 MHz coverage. Recognizing that rural customers typically drive further to meet their commercial needs, T-Mobile intersected its new 600 MHz coverage with a 10-mile radius drawn around the new stores to determine which stores were likely to draw consumers from areas with extended range 600 MHz coverage.

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- c. provide a list of all the competitive benefits projected to be achieved that were not achieved at all or were achieved only in part, and an explanation why any such projected synergy was not achieved or was achieved only in part; and*

A significant amount of the 600 MHz spectrum auctioned off by the FCC was already in use by broadcasters. As such, broadcasters must go through the extensive process of moving to other frequencies before the spectrum will be usable for wireless services. To speed up the process, T-Mobile is working with these broadcasters to assist them in moving to new frequencies, an approach that has allowed T-Mobile to gain access to the 600 MHz spectrum sooner and more cheaply than expected.<sup>19</sup> Nonetheless, because of this spectrum clearing process, T-Mobile has not fully realized the benefits of its 600 MHz spectrum purchase and does not expect to do so until after 2020. However, T-Mobile has no reason to believe that it would not realize synergies consistent with, or better than, its initial estimates.

- d. provide all documents discussing the competitive benefits that were achieved, achieved in part, or not achieved following acquisition of 600 MHz and/or 700 MHz spectrum.*

Documents responsive to *Specification 8d* are in the Document Production.

- 9. Provide all documents since January 1, 2012, discussing the decision to participate or not to participate in previous spectrum auctions such as the Incentive Auction, or upcoming spectrum auctions, including the 3.5 GHz Band, the C-Band, and any millimeter wave spectrum auctions. Further, provide all documents discussing bidding**

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<sup>19</sup> See, e.g., Press Release, T-Mobile, T-Mobile and CBS-Owned WLNY-TV Complete Early Spectrum Repack in New York City (July 9, 2018), <https://www.t-mobile.com/news/t-mobile-wlny-repack>; Press Release, T-Mobile, T-Mobile and NBC's KXAS-TV Accelerate 600 MHz Repack (Mar. 14, 2018), <https://www.t-mobile.com/news/nbc-600-spectrum-repack>; Press Release, PBS, Public Television Joins Forces with T-Mobile to Preserve Access to Public Television for Millions in Rural America (June 29, 2017), <http://www.pbs.org/about/blogs/news/public-television-joins-forces-with-t-mobile-to-preserve-access-to-public-television-for-millions-in-rural-america>; Press Release, T-Mobile, T-Mobile Partners with FOX TV's WWOR to Move Spectrum Frequencies Faster and For Less (Oct. 10, 2017), <https://www.t-mobile.com/content/t-mobile/corporate/news/articles/2017/10/t-mobile-partners-with-fox-tvs-wwor-to-move-spectrum-frequencies.html>.

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*strategy in past or upcoming spectrum auctions, including a discussion of the spectrum on which to bid, the dollar amount to bid, and how the bids should change based on competitive considerations. Explain how the Company's auction participation plans would be affected by the occurrence or not of the Proposed Transaction.*

Documents responsive to *Specification 9* are in the Document Production. As noted in response to *Specification 2f*, with the agreement of the FCC Transaction Team, the Document Production contains pre-2015 documents only from Key custodians. T-Mobile's participation in any upcoming spectrum auctions is not affected by the Proposed Transaction, other than:

(i) T-Mobile filed a request for a waiver to ensure that it could participate in the upcoming auctions notwithstanding the pendency of the Transaction (which involves another "nationwide" carrier); and (ii) if the company files to participate in an auction during the pendency of the Transaction, it will be required under the Agreement to implement protocols to ensure compliance with the prohibited communications rules.

**10. *Provide all analyses, including GUPPI analyses, merger simulations, econometric modeling, or similar analyses, including those regarding the effect of market concentration or pricing, that have been undertaken by the Company or any consultant or expert hired by the Company to analyze the effects of the Proposed Transaction, including all documents and data used in these analyses. If such analyses incorporate cognizable efficiencies, including quality and quality-adjusted price efficiencies, specify the types and amounts of cognizable efficiencies assumed, together with the justifications, data sources and work papers used for these efficiencies.***

Economic analyses and modeling were produced by the parties as part of their initial Public Interest Statement submission. The parties anticipate presenting additional economic work in their Joint Opposition to Petitions to Deny, to be submitted on September 17, 2018. This additional work will be placed in the docket, subject to appropriate protective order limitations, at that time. Because this additional work is currently in progress and has been undertaken by economists at the request of and under the direction of outside counsel, it is privileged, and therefore generally is referenced at this time only in the privilege log.

11. *The Applicants claim that New T-Mobile has every incentive to continue T-Mobile’s disruptive conduct in the mobile industry. (Public Interest Statement, pages 117, 124; see also Ewens Declaration, para. 10). The Applicants state that “reneging on the consumer-centric tenets of T-Mobile’s brand promise will greatly diminish the value of the Un-carrier brand.” (Ewens Declaration, para. 10). Moreover, in their Joint Declaration, Dr. Salop and Dr. Sarafidis claim that New T-Mobile plans to continue to behave as a maverick, rather than to settle into coordinated interaction with AT&T and Verizon. (Salop and Sarafidis Joint Declaration, paras. 33, 54). Provide all documents, including any underlying assumptions and models, relating to T-Mobile’s “Un-carrier” or consumer-centric brand promise.*

Documents responsive to *Specification 11* are in the Document Production.

12. *Provide all documents, and any underlying spreadsheets, that relate to or discuss difficulties in providing any Relevant Product or Relevant Service in any Relevant Area, including, but not limited to:*
- a. *spectrum utilization and efficiency;*
  - b. *how the Company evaluates and monitors capacity and capacity utilization, speed or quality of service, including the amount of spectrum, speed of connection, key performance indicators, and facilities (including cell splitting, cell site configuration, cell site densification, and backhaul) that are required to meet consumer demand;*
  - c. *the Company’s estimates of the amount and type of spectrum required to support each Relevant Product or Relevant Service and projections of whether and when the Company would exhaust its available spectrum in each Relevant Area;*
  - d. *any spectrum capacity constraints the Company is currently facing or is projected to face in the future;*
  - e. *dropped and/or blocked calls;*
  - f. *speed and other quality measures of data services;*
  - g. *the amount of spectrum needed for the Company to provide mobile wireless services for each technology deployed in the Company’s network;*
  - h. *the impact the availability of backhaul services has on the Company’s ability to provide data services at a particular rate of speed;*
  - i. *repurposing spectrum, including the transition of subscribers from the repurposed spectrum; and*

- j. alternative solutions to any spectrum constraint problems, including enhanced network or user equipment features, changing prices, or use of small cells or other network reconfiguration options.*

Documents responsive to *Specification 12a-j* are in the Document Production.

- 13. *The Applicants state that, on a standalone basis, “T-Mobile would be capacity constrained,” and that “T-Mobile’s ability to expand capacity to maximize the value of its spectrum assets and roll out robust 5G cannot come close to matching that of New T-Mobile.” (Public Interest Statement, page 19; see also Ray Declaration, paras. 18-20, 25). The Applicants further claim that New T-Mobile’s 5G network will have much greater capacity than the capacity of T-Mobile’s standalone 5G network in 2024. (Sievert Declaration, para. 12). Provide:*

- a. the engineering model and underlying assumptions relied on by Mr. Ray in making the statements contained in Section V of his declaration, and label it as Exhibit A to your response;*

The Applicants have provided the material and data that constitute the engineering model on which they rely in support of this transaction in a folder labeled “Specification 13 Exhibit A Engineering Model” on the Engineering USB drive. T-Mobile notes that the engineering model used to generate data tables provided in Section V of the Ray Declaration was already provided to the FCC on August 1, 2018.<sup>20</sup> Since the filing of the PIS, the engineering model was extended to incorporate the logic from T-Mobile’s ordinary-course LTE capacity-planning model and to provide certain functionality that will be required for the economic declarations to be submitted with the Joint Opposition to Petitions to Deny.

- b. an explanation of how the model relied upon by Mr. Ray was developed, whether and how it is used by T-Mobile in the ordinary course of business, and*

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<sup>20</sup> Letter from Nancy J. Victory, Counsel to T-Mobile US, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket 18-197 (Aug. 1, 2018).



*any deviations it contains from modeling done by T-Mobile in the ordinary course of business;*

The Ray Declaration calculations used a model that calculated the network's 5G offered traffic based on the underlying assets and projected spectral efficiency, as well as peak and average sector throughput based on vendor-provided spectral efficiency assumptions. As noted above, since that time the model has been extended. The complete model took as a starting point T-Mobile's ordinary-course LTE capacity-planning model and the 5G offered traffic model that underlay the Ray Declaration, which were then integrated and extended to add support for Sprint-specific assets and decision rules and congestion-avoidance logic for 5G. More specific descriptions of how exactly the model performs calculations is contained in the documentation tabs of the model worksheets provided in response to *Specification 13a* and the supporting documents to which those documentation entries link.

*T-Mobile's Ordinary-Course Capacity-Planning Model.* To help project where the existing T-Mobile LTE network will reach resource exhaust (congest), T-Mobile developed an engineering model in the ordinary course of business. Given forecasts of subscriber numbers and usage, this model is used as the basis for estimating annual spending needed to avoid congestion, defined as a sector falling below certain minimum average throughput thresholds during the busy hour. Those thresholds have changed over time as user expectations and available applications have changed. This engineering model has been used to direct approximately [REDACTED] in annual expenditures for the T-Mobile network ([REDACTED] total in the past 5 years) and is highly accurate (less than 1 percent difference from predicted traffic loads). Use of this model in the ordinary course has led to a [REDACTED] reduction in congestion

while traffic growth has increased by [REDACTED] (along with customer growth from 33M to 74M in the past five years).

***Integration of 5G Offered Traffic Model.*** As the existing T-Mobile network model is based upon LTE technology, it needed to be modified to allow certain spectrum bands to be moved to the 5G network over time, and to add the ability to upgrade a site to 5G to the set of congestion-avoidance solutions.

***Incorporation of Sprint-Specific Assets and Decision Rules.*** Because T-Mobile does not possess Sprint-specific assets—*e.g.*, 2.5 GHz spectrum—the model was extended to incorporate deployment of these assets, along with logic to determine the effect of their deployment, *e.g.*, information about their propagation characteristics. For the Sprint standalone version of the model, the model was also extended to incorporate as best as possible Sprint’s business rules regarding asset deployment and congestion avoidance.

***5G Congestion-Avoidance Logic.*** For 5G, the model was created utilizing the normal course of business LTE model using the same fundamental concepts such as throughput, congestion, and GB/subscriber usage, along with the same fundamental types of congestion-avoidance solution sets such as deployment of additional spectrum and cell splits. However, since there is no available 5G Ookla speed test data on which to base the model parameters or otherwise calibrate the model, those model parameters were based on spectral-efficiency projections under load from vendor simulations and general engineering principles.

- c. all documents related to all engineering models or claims, relied on by Mr. Ray or otherwise, for New T-Mobile, including all documents relating to 5G network coverage and speed for T-Mobile, Sprint, and New T-Mobile, including, but not limited to, all versions or drafts of any such model;***

Documents responsive to ***Specification 13c*** are in the Document Production.

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- d. all documents related to 5G network coverage and speed (2021 and 2024) for T-Mobile, Sprint, and New T-Mobile as shown in Figures 4 and 5 of the Public Interest Statement (Public Interest Statement, pages 26-27);*

Documents responsive to *Specification 13d* are in the Document Production.

- e. all documents related to the capacity of New T-Mobile’s 5G network and T-Mobile’s standalone 5G network, including reporting estimates by year for all years that such estimates were made;*

Documents responsive to *Specification 13e* are in the Document Production.

- f. all documents detailing assumptions about New T-Mobile’s spectrum holdings, including the estimated efficiency of spectrum used for 5G services and estimates of how much spectrum (and in what frequency ranges) New T-Mobile will provide 5G services;*

Documents responsive to *Specification 13f* are in the Document Production.

- g. all documents discussing the plans of T-Mobile to purchase additional spectrum on the secondary market; and*

Documents responsive to *Specification 13g* are in the Document Production.

- h. all documents, including models and the results from any field trials, discussing the current and projected performance characteristics of LTE-A and 5G from 2015 to 2024, including the efficiency of spectrum use, upload and download speed, latency, and deployment configuration.*

Documents responsive to *Specification 13h* are in the Document Production.

- 14. *The Applicants state that, “[i]n its initial three years, New T-Mobile will invest significantly more in network infrastructure than the standalone firms combined to build a world-leading nationwide 5G network.” (Public Interest Statement, page 80). Provide a detailed explanation why New T-Mobile would have the incentive to invest significantly more in network infrastructure than the standalone firms, and provide all documents related to New T-Mobile’s network investment incentives. Provide all documents discussing T-Mobile’s 5G network investment as a standalone entity.***

Documents responsive to *Specification 14* are in the Document Production.

As explained in the PIS, the primary goal of the merger is to build a world leading, robust nationwide 5G network. Achieving this goal is essential to the financial future of the combined company. The Transaction will enable New T-Mobile to offer a significantly improved network

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when compared to the networks that standalone T-Mobile or Sprint could develop. Most significantly, New T-Mobile expects to deliver a 5G network more quickly and on a broader and deeper basis than either T-Mobile or Sprint could as standalone companies—opening up opportunities for the merged company to grow its customer base significantly and enter into new lines of business. By themselves, neither company has the resources (spectrum, cell sites, or capital) to build a 5G network on a comparable scale. In contrast, the combined entity will have a robust network of low-, mid-, and high-band spectrum, and this spectrum, combined with the companies' integrated cell sites, will enable New T-Mobile dramatically to increase capacity and reduce costs.

Three interrelated drivers will incent New T-Mobile to invest to build the world-leading 5G network it described in the PIS:

- First, New T-Mobile will be compelled to integrate the T-Mobile and Sprint networks because operating the two networks in parallel would be unsustainably expensive, inefficient, and would eliminate most of the network performance advantages and cost savings (*i.e.*, synergies) outlined in the network plan. The integration of the two networks will necessarily involve upgrading or deploying new, 5G-capable, equipment across the existing T-Mobile network and the approximately 11,000 Sprint keep sites that will become part of the New T-Mobile network.
- Second, once the T-Mobile and Sprint networks are integrated, the additional incremental cost of deploying 5G will be modest.
- Third, while the additional incremental cost of deploying 5G is low, the incremental returns of 5G deployment are very high. These modest incremental costs and high incremental gains provide a powerful economic incentive for New T-Mobile to deploy 5G as quickly as possible.

In fact, New T-Mobile's business and capital investment plan hinges on completing these steps, recognizes the significant competitive risk of not deploying 5G, and is based on sound economic and financial considerations.

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Following the merger, the standalone T-Mobile network will serve as the base for the New T-Mobile network and the combined company will immediately begin integrating the T-Mobile and Sprint networks. This [REDACTED] process will involve, among other things, deploying the T-Mobile and Sprint spectrum across the New T-Mobile cell site infrastructure by installing new, or upgrading, 5G-capable radio equipment and improving the core network so that it can handle the increased traffic associated with the additional Sprint customers. There will be nearly-immediate network benefits of the merger (*e.g.*, improved coverage and LTE performance for many Sprint customers). However, until the networks are integrated, with radios upgraded and the combined T-Mobile and Sprint spectrum fully deployed across its sites, the network will not be fully capable of the extraordinary performance outlined in the PIS. Therefore, the full benefits of the speed, capacity, and coverage enhancements of the New T-Mobile network are contingent upon completion of the network integration.

Independently maintaining both networks in parallel would not make technical sense and would unnecessarily hobble the new company. The cost of maintaining separate T-Mobile and Sprint networks would be substantial and doing so longer term would not make any economic sense. Pending the completion of network integration, New T-Mobile will be unable to fully realize the synergies of the combined network. The cost of operating both networks in parallel is significantly greater than the cost of the combined and integrated networks and, for the years 2020-2024, it would cost approximately [REDACTED] (2020), [REDACTED] (2021), [REDACTED] (2022), [REDACTED] (2023), and [REDACTED] (2024), more to operate the networks in parallel. These billions represent cost synergies that are at the heart of the merger's value.

In total, New T-Mobile's revised financials identify approximately \$43.6 billion NPV in synergies generated by the merger. Of this \$43.5 billion, network synergies gained by

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eliminating the duplication of T-Mobile's and Sprint's existing networks constitute the largest share, approximately [REDACTED], or [REDACTED] percent of the massive cost savings. Unleashing these synergies requires investment and has a cost to achieve of [REDACTED] to decommission Sprint sites; [REDACTED] in net network integration costs). These synergies are critical to New T-Mobile's future growth and investment. In large part relying on these synergies, New T-Mobile's business plan calls for network capital expenditures of [REDACTED] in 2019, [REDACTED] in 2020, and [REDACTED] in 2021. The cost savings from the merger will also be used to continue investing in the network and business beyond 2021, expanding its reach, increasing its capacity, and improving its quality.

Once the T-Mobile and Sprint networks are integrated, upgrading the combined network to 5G has a very low incremental cost. As described above, in order to integrate the two networks and deploy both companies' spectrum assets across the combined network, New T-Mobile must upgrade or deploy new radios on its network sites. Although 5G service will not be active at this point, all of these new radios will be 5G-capable. Therefore, upgrading from 4G LTE to 5G following the integration can be done easily and seamlessly, and the incremental cost of this upgrade is modest.

In addition to integrating the network and upgrading to 5G, the New T-Mobile network plan also entails adding some additional 5G coverage and capacity in 2022-2024 in order to achieve the performance described in the PIS. This coverage and capacity increase will require additional sites, site upgrades, and software fees, and cost approximately [REDACTED] over the three-year period. This amount however is modest as compared to the incremental gain of the 5G coverage and capacity improvements. Accordingly, there is no advantage for New T-Mobile in deciding post-network integration to abridge or abandon its 5G deployment plan.

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New T-Mobile’s new 5G network, and the better value proposition that it will offer consumers, will empower the company to compete fiercely to grow its share of the market. As a result of the merger, New T-Mobile projects that it will quickly grow its share of voice customers from 31.3 percent in 2019 to 33.7 percent by 2021, and 36.8 percent by 2024. New T-Mobile’s superior network and aggressive pricing will also lead to a sustained share of gross adds (SoGA) in excess of its share of subscribers, and a substantial decrease in its churn. New T-Mobile expects that between 2019 and 2024 its SoGA will increase from 37.0 percent to 38.4 percent, and its churn will decrease from 1.30 percent to 1.14 percent. Further, part of this anticipated success is driven by New T-Mobile’s enhanced ability to compete in segments of the wireless market that are less accessible to standalone T-Mobile and Sprint, such as rural services and the enterprise segment, as well as New T-Mobile’s ability to compete beyond wireless in the in-home broadband market.

**15. *Provide a list, as of the date of this Request, by CMA, of the cell sites owned, leased, or shared by the Company, the percentage of cell sites collocated with each of the following: (1) Sprint; (2) AT&T; (3) Verizon Wireless; (4) U.S. Cellular; and (5) all other mobile wireless service providers.***

The Applicants have provided a table with the requested information labeled “Specification 15 Site Data.xlsx” on the Engineering USB drive. T-Mobile notes that the only sites for which it has collocation data are sites it owns. T-Mobile leases the overwhelming majority of its sites.

**16. *The Applicants state that New T-Mobile will increase cell site density “by retaining 11,000 cell sites from Sprint,” which “[i]n many instances . . . will obviate the need to work with the tower companies for new site leases.” (Ray Declaration, para. 31). For which retained cell sites would the Proposed Transaction obviate the need to work with the tower companies for new site leases, and for which would it not? For the cell sites to be retained, identify the expected cost and timeframe for standalone T-Mobile to***

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*obtain access, and provide all documents related to T-Mobile’s inability to access those cell sites.*

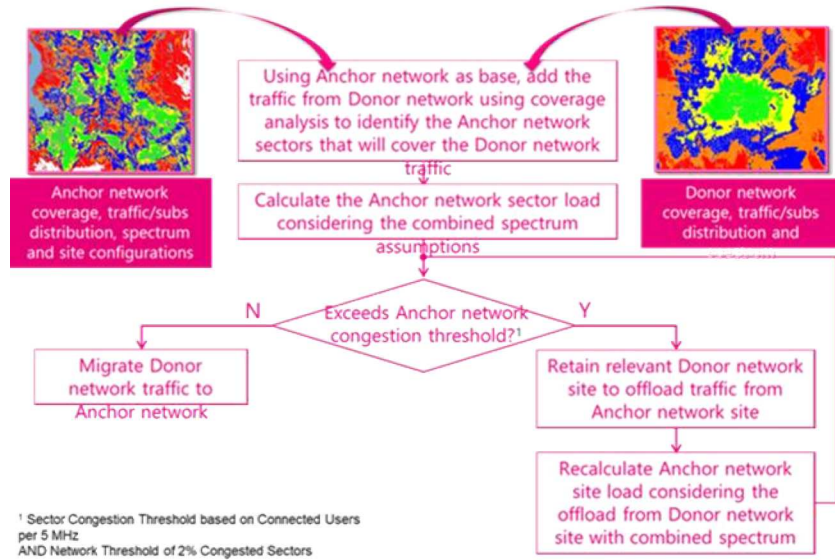
The Company has attached, as “Specification 16 Donor Sites.csv”, an Excel file responsive to Specification 16 on the Engineering USB drive. The file contains all of the data originally provided to the Company by Sprint as “Spain Site List\_09082017\_CLb.xlsb,” which is all of the data provided by Sprint to the Company on Sprint’s sites. The Company has added to the chart provided by Sprint the following:

- “Keep” Site?: This column indicates whether the site was designated to be retained in the engineering analysis done by Company to model the performance of the New T-Mobile network. The methodology for determining whether sites were kept or decommissioned is described below.
- “County FIPS,” “County Name” and “State”: These columns were added to identify general location information by mapping the Lat/Lon identified for each site to U.S. counties.

None of the data elements from the original Sprint site list have been deleted or modified. The Company does not have leases or other site agreements for these sites. Accordingly, the Company’s “keep” site analysis, as discussed below, did not undertake either a financial review of the sites or a site structural analysis, so the Company does not have site specific information on expected cost and timeframes for obtaining access to the sites.

When the engineering team modeled whether to keep or decommission sites in the Sprint network, they used the following analysis, where the “Anchor” network was T-Mobile’s and the “Donor” network was Sprint’s:





Notably, T-Mobile performed a similar analysis when determining, pre-merger, the costs and benefits of integrating the MetroPCS network. T-Mobile’s original business case called for the decommissioning of approximately [REDACTED] MetroPCS sites. However, when T-Mobile executed the actual integration of the MetroPCS network, it had to address site financial or structural issues that required modifying its original list of “keep” sites for the network. It was also better able to balance keeping additional MetroPCS sites instead of using new builds to address evolving capacity needs, and the company actually deconstructed only approximately [REDACTED] sites. At the time, the company estimated that keeping such additional sites where needed to offset capacity needs saved approximately [REDACTED] per site.

All non-privileged documents related to the engineering model, including any documents related to T-Mobile’s ability, or inability, to access sites and the benefits of site integration, have been provided in the Document Production.

17. *In his declaration, Dr. Evans emphasizes that network investments are essential to remain competitive, and cites to various internal documents. (Evans Declaration, paras. 140-41). Explain in detail the typical time horizon and process that T-Mobile plans for network improvements, upgrades, and capital expenditures in its ordinary*

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*course of business. Provide all documents relating to T-Mobile's ordinary course of business network upgrades and capital expenditure plans from January 1, 2012, to the present. Discuss in detail the Company's ordinary course of business plans for network coverage, data rate, capacity, and other quality improvements including coverage expansion to new areas and indoor coverage, and the planned new macrocell and small cell deployments in urban, suburban, and rural areas.*

Documents responsive to *Specification 17* are in the Document Production. As noted in response to *Specification 2f*, with the agreement of the FCC Transaction Team, the Document Production contains pre-2015 documents only from Key custodians.

T-Mobile uses its ordinary course network model to inform its network coverage, data rate, capacity, and other quality improvements. The engineering team works in collaboration with the business team to drive new products and coverage based on economic and business priorities. At any given time based on a wireless traffic forecast, the model identifies congested sectors using ordinary course criteria for defining congestion. Internally, T-Mobile has driven its LTE network to provide at least [REDACTED] (on average during the busy hours) to consumers in most market areas, a value that has risen over time in line with user expectations and application demands. When the network model predicts that this level of throughput will not be reached, it then specifies a series of technical solutions (such as cell splits) designed to alleviate that congestion. The solutions are suggested by the model, but the engineering and business team collaborate to determine if the solutions should be implemented or not.

Similarly, the engineering and business teams work together to determine opportunities for expanding to new areas, including indoor coverage. The two teams analyze the existing markets for business opportunities and then, based on cost/benefit analyses, determines if additional building will be implemented.

Additionally, the network engineering team has ongoing data tracking the performance of the network. This data helps inform the company of ongoing congestion issues or if particular subscribers have attempted to reach the T-Mobile network and instead are routed to a roaming partner. As these issues directly affect the business, they are primary factors in determinations of whether to add more macro/small cell sites to the network.

- 18. For any Relevant Service or Relevant Product in any Relevant Area, provide all:**
- a. short-term and long-term strategic and business plans;**
  - b. plans to reduce costs, improve services or products, improve service quality, improve capacity to transmit mobile wireless services, introduce new services or products;**
  - c. budgets and financial projections on a local, regional, or national basis; and**
  - d. presentations to management committees, executive committees, boards of directors, investors, investor analysts, bankers, and industry analysts.**

Documents responsive to *Specification 18a-d* are in the Document Production.

- 19. The Applicants state that New T-Mobile would provide “substantial capacity improvements that will benefit consumers” as demonstrated in Tables 3-6 and “will be able to provide dramatic improvements in data rates to consumers” as shown in Tables 7-8 of the Public Interest Statement. (Public Interest Statement, pages 42-45)**
- a. define “available capacity” and “carried capacity” as shown in Tables 3-6 and 7-8. Explain in detail whether these values represent monthly downlink, uplink, or combined capacities nationwide, and how they are calculated;**

“Available capacity” is the downlink capacity offered to consumers on a monthly basis.

The available capacity is the number of cell sites times amount of spectrum deployed per site times spectral efficiency times the number of sectors at the site. The average spectral efficiency-based throughput for each site is then calculated by multiplying the spectrum forecast, site deployment flag and *average* spectral efficiency values for each spectrum band per year. The

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available capacity for each site is calculated by converting the average throughput into monthly payload using the following conversion:

$$\frac{Mbps}{8 \text{ bits per byte}} \times \frac{3600 \text{ seconds per hour}}{7\% \text{ busy hour factor}} \times 30 \text{ days} \times \text{actual sectors per site}$$

“Carried capacity” is defined as the actual amount of traffic carried on the network (a percentage of the available capacity amount) for the downlink per month on each standalone network. To calculate the carried capacity figures in the PIS tables, a carried traffic factor was used based on each standalone company’s measured carried traffic on its existing network.

For T-Mobile, for 2016 and 2017, the measured carried traffic was [REDACTED] of the offered traffic. For Sprint, for 2016 and 2017, the measured carried traffic was [REDACTED] of the offered traffic. This factor is calculated based on the following formula:

$$\text{Carried Capacity Factor} = \frac{\text{Measured Traffic}}{\text{Spectral Efficiency – Based Capacity}}$$

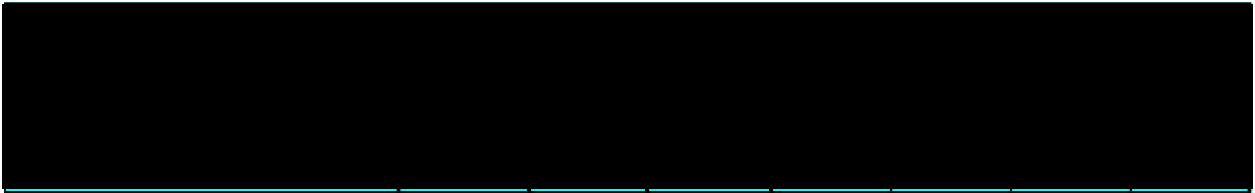
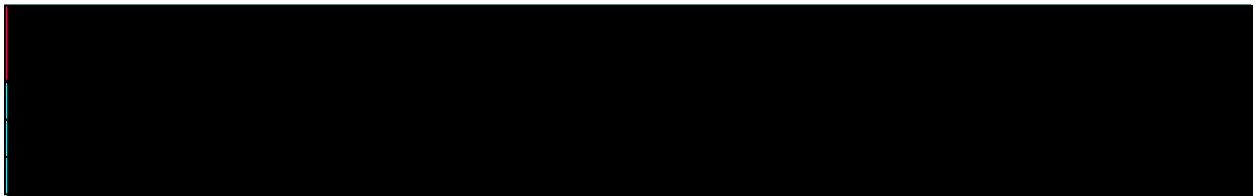
For the values in the tables in the PIS, the carried capacity factor measured for 2016/2017 was multiplied times the available capacity for each year.

- b. provide the current or projected nationwide “offered capacity” and “carried capacity” values from 2015 to 2024 for each of T-Mobile, Sprint, and New T-Mobile; and***

T-Mobile only has retained capacity numbers for its network only back to 2016. In addition, the measurements for 2016 and 2017 were snapshots at a point in time in the network (December of 2016 and December of 2017). The measured data for 2016 and 2017 for offered and carried capacity is:



T-Mobile has not projected values for New T-Mobile until 2021. From 2018 forward, T-Mobile has projected carried capacity for each year but has only projected available capacity for the 2021 to 2024 period. The projected data for 2018-2024 is:



- c. provide all plans, analyses, and reports reviewed and relied upon in making these tables, and provide all documents related to the claimed improvements.*

Documents responsive to *Specification 19c* are in the Document Production.

- 20. Provide, as of the date of this Request, polygons in an ESRI shapefile format representing geographic coverage in every Relevant Area for a -85 dBm RSSI signal level or better for each mobile broadband network technology (e.g., GSM, CDMA, EV-DO Rev. A, UMTS, HSPA, HSPA+, LTE, VoLTE, 5G) deployed in each frequency band (e.g., 600 MHz, 700 MHz, 800 MHz, AWS, PCS, BRS, EBS). Provide all assumptions, methodology (e.g., propagation, projection, field measurements), calculations (including link budgets), tools (e.g., predictive and field measurements), and data (e.g., terrain, morphology, buildings) used in the production of the polygons, and identify the propagation tool used, the propagation model used within that tool, including but not limited to, the coefficients used in the model, and any additions,**

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*corrections, or modifications made to the model. For detailed instructions, see the attached shapefile format specifications.*

T-Mobile has provided mapping data in shapefile format, as well as supporting documentation, in a folder titled “Specification 20” on the Engineering DVD-ROM. The mapping data provided by T-Mobile uses the following boundary edge definitions:

Band	Technology	Coverage Parameter	Coverage Threshold (dBm)
600 MHz	LTE	RSRP	-114
700 MHz	LTE	RSRP	-118
850 MHz	LTE	RSRP	-118
1900 MHz (PCS)	LTE	RSRP	-120
2100 MHz (AWS)	LTE	RSRP	-120
2100 MHz (AWS)	UMTS	RSCP	-104 , Ec/No > -12
1900 MHz (PCS)	UMTS	RSCP	-104 , Ec/No > -12
1900 MHz (PCS)	GSM	RSSI	-97

The Specification calls for using -85 dBm RSSI, which is not used by T-Mobile in the ordinary course. T-Mobile is in the process of recalculating the required coverage contours at -85 dBm RSSI, but the calculations are computationally time-consuming. The process involves generating the tech/band RSSI arrays in ASSET, processing the arrays in Array Wizard, importing/merge the output into national grids, converting the contours into MapInfo vector files, and then converting the vector files into ESRI shapefiles. The team will also need to perform quality acceptance during several steps of the process. T-Mobile estimates that it will finish all RSSI shapefiles and file with the FCC two weeks from when the FCC specifies the load factor for RSSI calculations. In addition, in order to provide bandwidth, as called for in the shapefile specifications for the coverage tables, T-Mobile must create equal power boundary (“EPB”) maps to associate areas of coverage with the cell site/sector serving particular areas. The other

coverage maps associated with this specification, for example, may include regions that have contour overlaps from multiple sites, where T-Mobile cannot identify a bandwidth associated with coverage for any specific polygon in the table. T-Mobile will generate the EPBs as it generates the RSSI coverage arrays and deliver the EPB national maps at the same time the RSSI coverage maps are provided.

21. ***Provide the projected 5G coverage maps in geo-referenced shapefile format for 2021 and 2024 with average download data rates being considered by the Company of: (a) 25 Mbps, (b) 100 Mbps, (c) 150 Mbps, (d) 300 Mbps, (e) 500 Mbps, and (f) 5G coverage for T-Mobile and New T-Mobile. (Public Interest Statement, Figures 4-5, pages 26-27, Tables 7-8, pages 44-45, Figure 10, page 46). For detailed instructions, see the attached shapefile format specifications.***

The data in Figures 4-5 on pages 26-27, Tables 7-8 on pages 44-45, and Figure 10 of page 46 of the PIS were direct outputs from calculations associated with the Engineering Supplement filed on August 1, 2018 in this docket.<sup>21</sup> In order to provide shapefiles, T-Mobile would have to reverse engineer the coverage from the engineering data (*i.e.*, the engineering data population figures are not the byproduct of coverage calculations using mapping data, the mapping data, as shown on Figure 10, page 46 of the PIS, is a byproduct of the engineering data outputs). The mapping data for ***Specification 21f*** is provided in a folder titled “Specification 21” on the Engineering DVD-ROM.

22. ***Provide all plans, analyses, and reports discussing the research and development of any new Relevant Product or Relevant Service by the Company, individually or with third parties, including those discussing the Company’s total expenditures associated with research, development, and testing of any new Relevant Product or Relevant Service.***

Documents responsive to ***Specification 22*** are in the Document Production.

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<sup>21</sup> Letter from Nancy J. Victory, Counsel to T-Mobile US, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket 18-197 (Aug. 1, 2018).

23. *For any Relevant Service or any Relevant Product in any Relevant Area, provide all documents discussing:*
- a. *the Company’s analysis of, or response to, the entry or potential entry of new competitors into any Relevant Product or Relevant Service;*
  - b. *any actual or potential effect on the supply, demand, cost, or price of any Relevant Service or any Relevant Product caused by the introduction by a current market participant of any new Relevant Product or any Relevant Service or by any change in the price or service characteristics of any Relevant Product or Service, or increase in the quality of any Relevant Product or Relevant Service;*
  - c. *any actual or potential effect on the supply, demand, cost, or price of any Relevant Service or any Relevant Product caused by competition from any new entrant, including cable companies, or by any new service regarded by customers as a potential substitute for the Relevant Product or Relevant Service;*
  - d. *prepaid mobile wireless service offerings, the development of new prepaid mobile wireless service offerings, or the expansion, improvement, or reduction of existing prepaid mobile wireless service offerings, or any other changes to the company’s current prepaid mobile wireless services offerings, including, but not limited to, brand development or elimination, retail expansion and distribution, promotions, and device offerings as a result of the Proposed Transaction; and*
  - e. *how the combined company would compete with other mobile wireless service providers, including, but not limited to, prepaid and postpaid advertising plans and strategies, prepaid and postpaid service plans and promotions, and prepaid and postpaid devices offered under either of the T-Mobile or Sprint brands.*

Documents responsive to *Specification 23a-e* are in the Document Production.

24. *The Applicants state that, “[t]he merger will allow New T-Mobile to deliver data rates that compete against wired data speeds,” (Public Interest Statement, page 45), and “[t]he merger enables New T-Mobile to offer an attractive high-speed in-home*



*broadband option in some areas in direct competition with existing incumbent wired broadband services.” (Sievert Declaration, para. 35). Provide all documents discussing:*

- a. New T-Mobile’s in-home broadband offerings, including a detailed discussion of deployment incentives, planned prices and data caps (if any), estimated revenue, market share, and adoption;*
- b. those areas where New T-Mobile plans to deploy in-home broadband offerings; and*
- c. any comparison of New T-Mobile’s in-home broadband offering with offerings from incumbent wired broadband services and other mobile service providers.*

Documents responsive to *Specification 24a-c* are in the Document Production.

- 25. Provide all plans, analyses, and reports discussing the extent to which customers may substitute mobile wireless broadband services for fixed broadband services (and vice versa) and sales or marketing efforts that reflect such potential substitution.*

Documents responsive to *Specification 25* are in the Document Production.

- 26. The Applicants assert that New T-Mobile would bring T-Mobile’s disruptive Un-carrier approach into new market segments. (Public Interest Statement, page 117). Identify all new market segments that New T-Mobile plans to enter. Submit all documents discussing the Company’s or any other person’s plans relating to any Relevant Product or Relevant Service in any Relevant Area, including, but not limited to: business plans; short-term and long-range strategies and objectives; budgets and financial projections; expansion or retrenchment plans; research and development efforts; plans to better manage services; plans to reduce costs, improve services, introduce new services, or otherwise become more competitive (e.g., plans to close, consolidate, or rationalize any facility or to discontinue the provision of any Relevant Product or Relevant Service); and presentations to management committees, executive committees, and boards of directors. For regularly prepared budgets and financial projections, the Company need only submit one copy of final year-end documents and cumulative year-to-date documents for the current year.*

Documents responsive to *Specification 26* are in the Document Production.

New T-Mobile’s nationwide 5G network will offer significant capacity and enable the Company to launch new services and compete in new markets. Below are descriptions of the markets that the Company plans to enter or expand:

- ***In-Home Broadband Replacement:*** The Company plans for New T-Mobile to launch an in-home broadband replacement service. New T-Mobile will create

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competition for in-home broadband, as well as consumer benefits from the substitution of mobile broadband services for wired broadband services. Today, millions have no broadband choice; with New T-Mobile, they will.

- ***Internet of Things (“IoT”) and Machine-to-Machine (“M2M”)***: The Company also plans to expand its stake in the IoT and M2M markets. This will transform the way Americans live, work, travel, and play by facilitating an enormous variety of IoT applications, as well as the full spectrum of connected devices. Even better, the broad geographic reach of New T-Mobile’s 5G network will facilitate the use of advanced applications that are critically needed in small towns and rural communities.
- ***Enterprise***: The Company expects that New T-Mobile will be able to more aggressively compete for enterprise customers. The Company plans for New T-Mobile to hire 1,100 new employees to pursue this opportunity.
- ***Rural***: The Company expects New T-Mobile to expand more widely into rural areas than T-Mobile or Sprint could do as standalone companies.
- ***Video***: The Company expects to expand its video distribution business significantly beyond the current standalone T-Mobile plans (to the Company’s knowledge, Sprint currently does not have plans to launch a video service). The Company expects to leverage its Layer3 assets to launch mobile and fixed video services to consumers in all markets.

27. ***The Applicants assert that “New T-Mobile will leverage the benefits of scale in network, costs, and financial resources to disrupt the video market by offering TV packages that will allow customers to forego traditional multi-channel video programming distributors (MVPDs) in favor of broadband-delivered video offerings. The Company’s 5G network will provide mobile and fixed video services to consumers in all markets, including rural areas, and deliver high quality—including 4K video—service offerings with lower prices than traditional options. This will exert tremendous competitive pressure on legacy cable providers and other MVPDs, forcing them to lower prices and invest and innovate to keep up with New T-Mobile.” (Public Interest Statement, page 76). Provide all plans, analysis, and reports discussing how T-Mobile/New T-Mobile will leverage the benefits of scale in network, costs, and financial resources to disrupt the video market, including, but not limited to, T-Mobile’s Layer3 TV (Layer3).***

Documents responsive to ***Specification 27*** are in the Document Production.

28. *Provide all documents discussing T-Mobile’s plans to develop its rural networks for 2018 through 2024, including:*
- a. *network expansion plans, including specific locations by Relevant Area and related timetables;*
  - b. *strategies involving the use of unlicensed spectrum;*
  - c. *relationships with rural service providers, including affiliated entities, if any, including any partnership arrangements and initiatives;*
  - d. *plans related to retail store expansion in rural areas, including the number of new retail stores expected to be operating in rural areas in 2019, 2020, 2021; and*
  - e. *New T-Mobile’s plans for replacing handsets for rural subscribers, and explain how New T-Mobile plans to migrate rural subscribers.*

Documents responsive to *Specification 28a-e* are in the Document Production.

29. *The Applicants state that “[i]n many rural areas there are currently no high-speed broadband alternatives, so the Transaction would introduce a high-speed alternative to DSL and satellite.” (Evans Declaration, para. 256). Provide a definition of “rural area.” Submit all documents related to 5G deployment for each year from 2019 to 2024 in rural areas for standalone T-Mobile, standalone Sprint, and New T-Mobile, and provide a detailed explanation of how the merger increases the incentive and ability of New T-Mobile to deploy rural high-speed broadband in comparison to standalone T-Mobile.*

Documents responsive to this specification have been included in the Document Production, and link budget documents have been provided in the folder on the Engineering DVD-ROM titled “Specification 29.”

T-Mobile utilized the definition of rural area employed by the FCC in the 2018 Broadband Deployment Report, 33 FCC Rcd 1660, 1716. Specifically, census blocks are designated as rural based upon the designation used in the 2010 Census. The term “rural” encompasses all population, housing, and territory not included within an urban area.

The Company believes New T-Mobile will have increased incentives—and ability—to deploy high-speed services in rural areas. As discussed in the PIS, T-Mobile has 600 MHz

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spectrum where it is planning to deploy 5G services, including providing substantial rural coverage. However, the standalone T-Mobile lacks the current spectrum depth in these areas to provide high-speed services, as that term is used in the 5G context. The Applicants also explained how standalone Sprint does hold significant spectrum assets that could be used to provide high-speed services, but lacks coverage spectrum in rural areas. While, in theory, a standalone Sprint could deploy 2.5 GHz spectrum at any place that New T-Mobile might, there are no incentives to deploy such capabilities in areas where broader coverage does not exist. If standalone Sprint were to deploy a small pool of 2.5 GHz coverage in an area where it lacked more ubiquitous 5G coverage—as would be provided by T-Mobile’s 600 MHz spectrum—significant problems with marketing the service and consumer satisfaction would likely result. Because New T-Mobile can provide the baseline of 5G service throughout a much broader footprint—including rural areas—it has the capability and incentive to supplement that deployment in areas where capacity is needed with 2.5 GHz builds. In addition, the combined customer base of New T-Mobile enables the company to absorb the costs of rural deployment over a larger customer base.

- 30. *The Applicants state that New T-Mobile will be “providing fixed in-home broadband service of at least 25/3 Mbps to 52.2 million rural residents over 2.4 million square miles, approximately 84.2 percent of rural residents.” (Public Interest Statement, page 66). Provide all documents, including RF link budgets, assumptions, studies, and RF propagation models, relied upon in making this statement, and coverage maps in geo-referenced shapefile format depicting the projected fixed in-home broadband service in any Relevant Area.***

Documents responsive to ***Specification 30*** are in the Document Production. In addition, T-Mobile has provided mapping shapefiles and supporting explanatory documentation in a folder titled “Specification 30” on the Engineering DVD-ROM.

31. *For any Relevant Service or any Relevant Product in any Relevant Area, provide all documents discussing:*
- a. *buyer substitution responses to price or product changes, including all analyses of elasticities of demand (own-price elasticities and cross-price elasticities with respect to competitors, and the elasticity of demand for the industry as a whole (aggregate elasticity of demand)), and any estimates of diversion ratios/rates among competing suppliers of the Relevant Product or Relevant Service;*
  - b. *churn and subscriber acquisition and retention, including:*
    - (i) *churn data, including the correlation of churn with quality, length of contract commitments, national footprint, price, the expected impact of migration to new technologies on churn, type of customer, and any other factors;*
    - (ii) *data or studies indicating that a customer left or switched to the Company because of pricing, network quality, customer service, or the absence or availability of particular services or devices (including data on subscribers lost or gained), and any consumer surveys undertaken about consumer substitution across mobile wireless service providers;*
    - (iii) *data or studies on switching costs or customer inertia or both;*
    - (iv) *the Company's experience or success in retaining customers, including examination of customer tenure and the value or net present value of a customer or type of customer;*
    - (v) *the Company's experience or success in obtaining customers through marketing or promotions targeted at particular mobile wireless service providers, particular geographic areas (including local and regional promotions), particular wireless devices or types of customers (including the offers made and the amount spent on the marketing effort, the*

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*number of new subscribers gained, churn rates for such subscribers, and revenue realized by the Company);*

- (vi) customer acquisition costs, including per gross addition costs;*
  - (vii) the characteristics of consumers who want to purchase standalone services or bundled services; and*
  - (viii) descriptions or analyses of bidding results for enterprise or other large customers.*
- c. any attempts to win customers from, or stem losses to, other mobile wireless service providers;*
  - d. share of sales or revenues of the Company or any of its competitors, including subscriber counts, gross additions, deactivations, and net additions; and*
  - e. share of sales through various distribution channels (e.g., own sales versus sales through exclusive or non-exclusive third parties) of the Company (by channel and by name for each third party) and its competitors.*

Documents responsive to *Specification 31* are in the Document Production.

32. *Provide all documents that employ, discuss, or calculate customer lifetime value (CLV) or any other concept related to the present discounted value (e.g., active customer value, lifetime customer value, average customer value) to the Company of acquiring a new customer for any Relevant Service. State, describe in detail, and provide documents sufficient to show the Company’s most current and best estimate of CLV or present discounted value to the Company of acquiring a new customer for each Relevant Service, including a description of how the calculations were performed and overall methodology, including the parameters used in the determination of such value. Provide all data upon which the calculations are based and the programs used for the calculations. If the Company employs more than one concept related to the value of a customer, the Company’s response should provide the calculation and description for each approach, and a description of how the Company uses each approach in the ordinary course of business.*

Documents responsive to *Specification 32* are in the Document Production.

The Company calculates “customer lifetime value” (“CLV”) and utilizes that metric throughout its business and business units. CLV refers to the measurement and prediction of the net profit attributed to the entire future relationship with a customer. As applied, the calculation attempts to measure the present value of the future cash flows attributed to the customer during

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his/her entire relationship with the Company from the present time forward (for example, the calculation includes acquisition costs for valuation of ‘to be acquired’ customers, but it excludes acquisition costs for valuation of existing customers).

### *Calculations*

The main inputs into the CLV calculation are estimated using segment averages:

- Average revenue per user per month (“ARPU”)
- Average cash cost per user per month (“CCPU”)
- Expected life of an account per month (“Expected Life”)
- Discount rate, which is used to measure the present value of future revenues. The Company typically uses 0.6 percent per-month for this figure.
- Cost per gross addition (“CPGA”), which represents the cost incurred to acquire incremental customers.

Gross CLV is calculated as:

- $(\text{ARPU} - \text{CCPU}) \times \text{Expected Life}$ , discounted to measure the present value of future revenues. The Company typically uses a discount rate of 0.6 percent, which is equivalent to company WACC.

Net CLV is calculated as:

- $\text{Gross CLV} - \text{CPGA}$

### *Parameters*

Below, the Company provides further information regarding each of the components mentioned above.

The data used to calculate ARPU include:

- Monthly recurring revenues for voice, data, text, and other subscription features.
- Roaming and toll revenue

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- Prepaid refill revenue
- Expected late, restore, and other nonrecurring charges
- Regulatory fees and taxes

Additionally, certain factors are subtracted from the revenue figure prior to dividing by the total users figure. These figures are identified as “contra-ARPU.”

- Recurring bill credits
- Corporate node discounts (incentives for companies to sign up employees for personal accounts).
- Refill and partner incentive payments (“SPIFF”)

The data included within the Company’s CCPU calculation include:

- Direct network cost (interconnect and LD/toll)
- Customer care cost
- Expected cost of upgrades (device margin, financing expense, bad debt, remorse, commission)
- Service of bad debt
- Marginal bill processing, postage, payment processing, platform, and collection expenses
- Roaming (domestic and international)
- Costs of included services (*e.g.*, Netflix, GoGo)

The data included in the Company’s CPGA include:

- Incremental CPGA costs:
  - Demand generation (costs related to marketing media & advertising, marketing back office)
  - Variable sales and commissions costs (including device financing, device bad debt, switching incentives, *etc*)
- Brand tax:



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- Apple “tax”
- Sponsorship fees
- Payments to DT for the use of the color Magenta and the T-Mobile mark
- Fixed CPGA costs:
  - Payroll (up to Director level of sales hierarchy)
  - External labor
  - Leases, rents, office services
  - Staffing, training, and recruitment, web content facilitating costs, supply chain back office, travel and entertainment and other fixed costs.

The Average Expected Life of an account is calculated using customer profiles and data related to churn to calculate the likelihood of an account surviving over a period, typically 60 months.

Figures for CLV and CPGA are assessed on an “incremental” and “fully loaded” basis with “incremental” figures looking at the costs associated with demand generation along with other variable costs, while the “fully loaded” figures also incorporate fixed costs and brand taxes. Fully loaded CLV are used when comparing brands/lines of business because the fully loaded costs are “variable” in that context. Incremental CLV are used when comparing periods or promotions within a brand or product since the fixed costs are considered sunk.

### *Uses of CLV*

The CLV calculation feeds into the monthly publication of “Unit Economics,” which compiles CLV figures for each of the Company’s businesses (Magenta, Magenta Prepaid, MetroPCS, and MVNO). The Company utilizes Unit Economics and the CLV calculation to evaluate its per-customer service revenue realization and to assist in forecasting future service revenues.

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Net CLV also feeds into other metrics. For example, Net CLV also feeds into the calculation of Acquisition EV, which represents the overall value of a business opportunity in which the Company would acquire a number of subscribers. Acquisition EV is calculated as:

*Net CLV × Activation Volume (or the number of lines opened by the prospective account).*

Net CLV also feeds into the calculation of Return on Network (“RoN”) of the additional business or use of capacity by that promotion or investment. RoN is calculated as:

*Net CLV ÷ Average Lifetime GB.*

Return on Network is the value of future cash flows divided by the normalized network consumption for that customer. It is used in the business as a yield management measure which ensures that prospective customers or opportunities provide a sufficient return versus other potential uses of the primary capital driver of the business: the network.

CLV also provides a framework to assess future and past decisions on corporate investment, marketing, new features, incentives programs and pricing. For example, when the Company considers a promotional deal, an assessment of how that promotion impacts the value of the future cash flows associated with the Company’s installed base will be generated using a calculation that parallels CLV with inputs reflecting the Company’s existing customers. This approach incorporates metrics like CCPU rather than CPGA (which for existing customers would necessarily be zero). A determination will be made to assess the impact of that promotion on cash flows against the expected value of any customers acquired. Accordingly, a promotion is justifiable if it will add sufficient customer value to offset lost value in the installed base as represented by the net of the CLV of those new customers subtracting the lost value in the installed base. Similar assessments are made for determining whether new advertising campaigns, bundling efforts, or partnerships are net-beneficial.

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A modified figure, CLV60, is used to provide a truncated 60-month forward-looking view. The unmodified CLV is not limited by time, instead all future revenues are calculated in perpetuity and then discounted to arrive at the net present value of that future income. CLV60 limits the forward-looking period to the next 60-months to provide a more concrete and reliable view of future revenues.

Each component of CLV also serves a function in evaluating and projecting a portion of the companies cost and revenue structure. The Company utilizes ARPU to assess per-customer service revenue realization, to assist in forecasting future service revenues, and to evaluate the average monthly service revenues generated from the customer base. The Company utilizes CPGA to assess the efficiency of its distribution strategy, validate the initial capital invested in its customers, and to determine the number of months to recover its customer acquisition costs. This measure also allows management to compare the Company's average acquisition costs per new customer. The Company utilizes CCPU as a tool to evaluate the non-selling cash expenses associated with ongoing business operations on a per customer basis, to track changes in these non-selling cash costs over time, and to help evaluate how changes in the Company's business operations affect non-selling cash costs per customer.

Because the Company's Un-carrier approach treats prospective customers equally with existing customers—using the assumption that all T-Mobile customers will take advantage of new rates or features that they find attractive—the CLV calculation is not typically employed to assess retention of customers, for example, by substituting retention costs for CPGA. Instead, the Company maintains a forward-looking approach and evaluates existing customers and prospective customers collectively when making business decisions. Similarly, existing customers are not typically evaluated individually except in rare instances where extreme

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customer behavior warrants assessing the value of the business relationship. For example, customers identified as “extreme-roamers” (individuals whose wireless subscriptions are initiated in the United States, but almost exclusively used to roam) may be assessed to determine whether the company is losing money on the relationship due to untenable roaming fees and in violation of our explicit fair-use policies.

33. ***Provide all documents discussing T-Mobile’s pricing decisions for any Relevant Product or Relevant Service in any Relevant Area and in the United States as a whole, including, but not limited to discussions of: (1) pricing plans, including unlimited; (2) pricing policies; (3) pricing forecasts; (4) pricing strategies; (5) pricing analysis; (6) introduction of new pricing plans or promotions, including local promotions and their determinants, and expected or actual impact; (7) tiered pricing, and expected or actual impact; (8) pricing decisions relating to each Relevant Service and Relevant Product; (9) which prices, if any, are set through individualized negotiations, and the criteria and process use to determine rates; and (10) any other factors considered in how the Company prices each Relevant Product or Relevant Service in each Relevant Area.***

Documents responsive to ***Specification 33*** are in the Document Production.

34. ***Identify each major pricing, plan, or promotional action taken by T-Mobile since January 1, 2012, and for each:***
- a. ***explain whether and how this action reflects T-Mobile’s Un-carrier brand or behavior as a maverick, as opposed to an action that would plausibly have been taken by a non-maverick or other carrier without the Un-carrier brand;***
  - b. ***explain and provide documents sufficient to show T-Mobile’s strategic rationale for the pricing, plan, or promotional action; and***
  - c. ***provide all plans, analyses, or reports relating to or analyzing the business impacts of the pricing, plan, or promotional action, including retrospectively.***

Documents responsive to ***Specification 34b-c*** are in the Document Production.

T-Mobile has attached, as Exhibit C, a table that provides a list of the major pricing, plans, and promotional actions taken by T-Mobile, with a link for each to a press release discussing how the moves relate to the Un-carrier brand and the pro-consumer strategies underlying the plans. These documents are also provided under the folder titled “Specification

34” on the Economics DVD-ROM, and the documents will be included within the Document Production provided to the FCC on September 24, 2018. We are also providing, within the table, a brief textual explanation addressing the explanations requested in *Specification 34a* and *Specification 34b*.

35. *For the dates January 1 and July 1 in the years 2012 through 2018, and for each brand under which the Company sells mobile wireless services, identify the 10 best-selling mobile wireless services pricing plans for the United States as a whole, as measured by subscribers. For each pricing plan identified: (i) state the number of total subscribers to each plan; (ii) state the number of new subscribers added in the prior six months; (iii) describe and identify the price of and all features and services encompassed in the plan, including but not limited to, the number of included minutes and data services, whether mobile wireless services can be shared with others, any promotions offered to attract new subscribers to the plan, and any charges for usage in excess of the maximum allowed under the plan; and (iv) provide the ARPU for each such pricing plan.*

T-Mobile has provided the requested data as “Specification 35 Popular Plans.xlsx” on the Economic DVD-ROM. Pursuant to discussions with the FCC Transaction Team, because T-Mobile’s tracking of data to calculate ARPU through the finance matrix is available starting only in mid-2013 and early 2014, the plans data provided is for that date range through present only. T-Mobile has provided the “number of new subscribers added in the prior six months” both with respect to: (i) subscribers who are new to T-Mobile who have signed up for the plan and (ii) subscribers who are new to the plan, regardless of whether they are new to T-Mobile or whether they are existing customers switching between different plans.

36. *The Applicants assert that New T-Mobile will bring disruptive Un-carrier choices for enterprise business and government customers. According to the Public Interest Statement, the combined company “will be able to integrate the Sprint wireline assets to diversify its enterprise offerings and make available fixed broadband products, cloud computing services, network security offerings, or other complementary business lines.” With its 5G network, the Applicants claim that “New T-Mobile will be able to support and spur the broad spectrum of commercial IoT applications of the future.” (Public Interest Statement, pages 73-74). Provide all plans, analyses, and reports discussing enterprise and government segments and services, including, but not limited*

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*to, whether and how New T-Mobile will offer flexible and inventive plans and pricing, as opposed to the pricing plans of a standalone T-Mobile.*

Documents responsive to *Specification 36* are in the Document Production.

37. *For any Relevant Service or any Relevant Product in any Relevant Area, provide all documents (including any surveys conducted by T-Mobile or by any third party) that discuss:*
- a. *the competitive positioning of the Company and other mobile wireless service providers (e.g., price and quality relative to others);*
  - b. *how reliability and reputation affect competition or potential competition; or*
  - c. *how consumers or enterprise customers or competitors view and value mobile wireless services or products offered by the Company or by other mobile wireless service providers, including:*
    - (i) *their perceptions of customer service, network quality, network coverage plans, and features;*
    - (ii) *the impact of not offering particular wireless services or devices;*
    - (iii) *the impact of pricing on decisions to purchase any Relevant Service or any Relevant Product;*
    - (iv) *the impact of variation in subscribers' usage patterns across different pricing plans and devices;*
    - (v) *the impact of roaming; and*
    - (vi) *the impact of being able to use products and services internationally.*

Documents responsive to *Specification 37* are in the Document Production.

38. *Provide all documents discussing the possible effects of the Proposed Transaction on roaming or discussing New T-Mobile's offering of roaming arrangements. Further, identify any person (including mobile wireless service providers) to whom the Company provides, pursuant to a current roaming agreement, each Relevant Service for use by that person's subscribers in any Relevant Area. For each person whose subscribers used the Company's Relevant Service, provide all documents related to the negotiation*

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*of any associated agreements, and list, in csv format, on a monthly basis and for each Relevant Area in which the Relevant Service is provided:*

- a. the name of the person;*
- b. the total number of subscribers of the person using the Company's Relevant Service;*
- c. the total minutes and the total megabytes, as relevant, of the Company's Relevant Service used by the person's subscribers;*
- d. the total amount, the price per minute, and the price per megabyte, that the Company charged the person for the Company's Relevant Service used by that person's subscribers; and*
- e. the Company's total sales of roaming services, in dollars, minutes of use, and in megabytes of data, used separately for each mobile wireless technology.*

T-Mobile has provided the requested data as "Specification 38 Roaming.csv" on the Economic DVD-ROM. Documents responsive to *Specification 38* are in the Document Production.

- 39.** *The Applicants assert that "New T-Mobile has the same competitive incentives with respect to, and will bring the same network benefits to, its relationships with MVNOs." In particular, the Applicants contend that "New T-Mobile will have significant added network capacity, and therefore will have no incentive to impair MVNOs' ability to put subscribers on New T-Mobile's network." The Applicants further maintain that "New T-Mobile will encourage the launch of new MVNOs that can offer unique value propositions or better reach unique customer segments." (Public Interest Statement, pages 123-24). Provide all documents discussing MVNOs as they relate to T-Mobile and all documents relating to plans or projections for New T-Mobile, including any analysis of the competitive effects of MVNOs in the mobile wireless marketplace, and analysis of the costs and revenues of customers served through an MVNO.*

Documents responsive to *Specification 39* are in the Document Production.

- 40.** *Provide a complete list of MVNOs that have provided or are providing mobile wireless service using T-Mobile's network, and explain in detail how the Proposed Transaction would affect current MVNO agreements. Provide all documents discussing the possible effects of the Proposed Transaction on wholesale charges or discussing New T-Mobile's offering of wholesale arrangements. Further, identify any person (including mobile wireless service providers) to whom the Company provides, pursuant to a wholesale agreement, each Relevant Service for use by that person's subscribers in any Relevant Area. For each person whose subscribers used the Company's Relevant*

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*Service, provide all documents related to the negotiation of any associated agreements, and list, in csv format, on a monthly basis and for each Relevant Area in which the Relevant Service is provided:*

- a. the name of the person;*
- b. the total number of subscribers of the person using the Company's Relevant Service;*
- c. the total minutes and the total megabytes, as relevant, of the Company's Relevant Service used by the person's subscribers;*
- d. the total amount, the price per minute, and the price per megabyte, that the Company charged the person for the Company's Relevant Service used by that person's subscribers; and*
- e. the Company's total sales of wholesale services, in dollars, minutes of use, and in megabytes of data used separately for each mobile wireless technology.*

T-Mobile has provided the requested data as "Specification 40 MVNO.csv" on the Economic DVD-ROM. Documents responsive to *Specification 40* are in the Document Production.

The Transaction does not affect any of the MNVO agreements disclosed in response to this specification. These relationships are contractual and none of the contracts has change of control provisions relating to the host network. In any event, as stated in the PIS, the New T-Mobile network will have expansive capacity and incentives to fill it, providing significant economic incentives to continue to host MVNOs on its network.

- 41. The Applicants assert that New T-Mobile would use the existing T-Mobile network as its anchor, thereby enabling New T-Mobile to migrate Sprint customers to the existing T-Mobile network within three years without degrading the user experience for LTE. The Applicants state that: (1) Sprint subscribers with compatible devices would be able rapidly to convert to the New T-Mobile network; (2) New T-Mobile would migrate CDMA voice users to VoLTE; and (3) the 1900 MHz PCS band would allow a seamless*



*integration of Sprint’s existing customers onto T-Mobile’s network. (Public Interest Statement, pages 38-39).*

- a. describe in detail how this migration plan would be accomplished within three years without degrading the user experience for LTE;*

As a first step towards network integration, existing T-Mobile and Sprint subscribers must be moved to a common core network. The core network is the backbone of the wireless system that manages mobility management, call and session setup, user authentication, and access authorization as well as traffic routing through the network. Shortly after completion of the transaction, the New T-Mobile engineering team will work to bridge the two standalone core networks together on a temporary basis. This will allow for the seamless integration of the T-Mobile and Sprint networks and Sprint customers then will have expeditious access to the sites retained on the combined network where there is open, available capacity. This will be accomplished through use of Multi-Operator Core Network (“MOCN”) technology. MOCN allows for a seamless migration to a virtual single core network by routing appropriate services to the “home” network—which in this case will be the existing T-Mobile core.

As Sprint customers are migrated off the Sprint core, this process will be ended on a market-by-market basis and a single New T-Mobile core network will remain. By quickly combining the networks and making it available to all subscribers, New T-Mobile will ensure that the transition occurs without any short-term disruption or service degradation to customers. In fact, coverage and service options for many customers, especially Sprint customers, will expand as they gain access to the more geographically widespread New T-Mobile network. Without a common core network, Sprint customers would not have full functionality on the combined New T-Mobile network—and would not be able to place or maintain communications, roam, or hand-off to other cell sites.

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At the same time, the New T-Mobile core network will need to be scaled to allow for the increased traffic associated with adding the nearly 55 million customers on the Sprint network to the existing T-Mobile core network. Once this enhancement of the core network is completed, the Sprint core network will gradually be decommissioned to allow for a single core network for New T-Mobile.

Simultaneously, New T-Mobile will use an over-the-air software update to upgrade the more than 20 million Sprint devices (or more than one-half of the branded customer base) compatible with the existing T-Mobile network to allow existing Sprint customers to migrate (on their existing devices) to the New T-Mobile network. New T-Mobile must also ensure that there is sufficient capacity (radio and core network resources) to handle the increased traffic before all these customers are moved to the new network. In light of this, New T-Mobile will migrate Sprint customers on a market-by-market basis, depending on market load and available engineering resources. For those markets with available capacity, the Sprint customer migration will be nearly immediate—improving coverage and user experience for these users. Other markets will undergo similar migrations as soon as New T-Mobile is able to upgrade network resources to handle the additional traffic, which should initiate for customers with compatible devices in the first year after completion of the transaction in all markets.

Finally, the existing cell site infrastructure for the combined company will be optimized in the near-term. The existing company tower sites have been reviewed to: (1) select the Sprint sites to be retained and (2) determine the spectrum resources to be placed on each site. This optimization is based upon the network coverage, traffic and subscriber distribution, and the spectrum and site configurations of each standalone network to select the best sites to retain or improve for New T-Mobile. As a result, approximately 11,000 Sprint cell sites will be retained

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to improve either capacity or coverage for New T-Mobile (approximately [REDACTED] for capacity and [REDACTED] for coverage). In addition, spectrum resources from both T-Mobile and Sprint will be applied to the New T-Mobile cell site infrastructure. For the retained Sprint cell sites, 600 MHz radios will be added to nearly [REDACTED] cell sites as well as additional 2.5 GHz radios to more sites than were projected by the Sprint standalone plans (nearly [REDACTED] more cell sites will have 2.5 GHz by 2021; nearly [REDACTED] more by 2024). The existing 2.5 GHz radio equipment installed on the retained Sprint cell sites will require electronics replacement to ensure compatibility with the New T-Mobile network. For the existing T-Mobile cell sites, 2.5 GHz radios will be added to the majority of sites to boost capacity. For all New T-Mobile cell sites, the AWS and PCS radio base will be upgraded (as needed) to add radios capable of both LTE and 5G.

By proceeding in this measured manner to transition Sprint customers to New T-Mobile, the existing LTE experience will not be degraded. Decommissioning of any Sprint cell site will not occur until: (1) there is comparable coverage from New T-Mobile and (2) there is capacity on New T-Mobile to handle the additional traffic.

- b. provide all documents discussing or relating to the expected cost of achieving the migration plan, and all documents discussing the customer migration plan, including the transition of MVNO customers and Lifeline customers;***

Documents responsive to *Specification 41b* are in the Document Production.

- c. describe in detail the plans for T-Mobile and New T-Mobile to sunset GSM and HSPA/HSPA+, and for Sprint and New T-Mobile to sunset CDMA 1x voice and EV-DO Rev. A technologies; and***

As shown in detail in Table 2 of the Ray Declaration, New T-Mobile will be aggressively refarming spectrum from 2G, 3G, and 4G to 5G as rapidly as possible. Assuming all customers are migrated to new LTE-capable devices, New T-Mobile expects to sunset use of its HSPA/HSPA+ network [REDACTED]. GSM services still provided by New T-Mobile are

provisioned in guard band spectrum that cannot be utilized by LTE and does not require extensive amounts of spectrum. Therefore, there is no near-term expectation that the GSM network (as it is currently constituted) [REDACTED]. CDMA services (including 1x voice and EV-DO Rev. A) are maintained on the 800 MHz spectrum band [REDACTED].

Customer migrations for each of these technologies are not fully developed and will not be completed until after the merger is closed. New T-Mobile would anticipate that this process will follow the successful methods used to transition customers in the past to new technologies—initial handset promotions followed by aggressive marketing along with natural handset upgrades. No consumer would be transitioned from existing 2G or 3G technology without a replacement service that is comparable in coverage and service quality.

***d. describe in detail New T-Mobile’s transition plans for M2M services offered over its 2G network.***

New T-Mobile has no near-term plans to sunset use of its 2G GSM network, so there are no detailed transition plans for the M2M subscribers for that technology. Detailed transition planning has not occurred and will not begin until the transaction is consummated. However, any transition would ensure that existing subscribers and services would not be displaced without a replacement service that is comparable in coverage and capacity.

***42. In his declaration, Mr. Ewens states that “Sprint customers will receive more value for less money shortly after close and with minimal disruption as we enable their phones to access the T-Mobile network.” (Ewens Declaration, para. 8). Provide all plans, analyses, and reports discussing New T-Mobile’s cost savings for or quality benefits to Sprint customers. Discuss in detail how Sprint’s push-to-talk services, including in the enterprise and government market, would be affected by the Proposed Transaction.***

Documents responsive to ***Specification 42*** are in the Document Production.

New T-Mobile will migrate Sprint CDMA customers onto the combined network in a carefully planned transition. [REDACTED]

[REDACTED]. Push-to-talk (“P2T”) services will be included in the migration plan, but specific preparations have not been made at present time. The Company expects to offer similar a P2T service that operates on LTE and 5G networks and will migrate P2T customers—government and enterprises included—from the CDMA network as the transition progresses. Detailed transition planning has not occurred and will not begin until the transaction is finalized when all existing contracts can be reviewed. However, any transition would ensure that existing subscribers and services would not be displaced without a replacement service that is comparable in capability.

**43. *The Applicants state that “a built-in LTE feature known as Multi-Operator Core Network (MOCN) will allow us to unify the T-Mobile and Sprint radio access networks (RANs) almost immediately and allow Sprint existing customers with compatible devices to seamlessly access the best of both networks during integration.” (Ray Declaration, para. 66).***

***a. state how many, and what percentage of, T-Mobile and Sprint devices are compatible with the MOCN feature;***

MOCN is a standard feature that is built into the LTE chip and is available for any device that is compatible with LTE. MOCN will be used to allow existing Sprint customers to access the T-Mobile RF network, as this existing network will be the anchor network for New T-Mobile. Existing T-Mobile subscribers are already able to access the T-Mobile RF network, so there is no need for MOCN. Any Sprint customer device that is LTE-capable would be able to utilize MOCN, if the capability is turned on in the local network. Additionally, the Sprint device would need to support a spectrum band that is available on the T-Mobile network. T-Mobile’s RF network utilizes licensed spectrum in the 600 MHz, 700 MHz, 850 MHz, 1900 MHz (PCS),

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and 1700/2100 MHz (AWS) spectrum bands. Any Sprint device that supports one of these spectrum bands and is LTE-capable would be able to use the MOCN feature. Sprint has indicated in its response to Specification 43 that this would be more than 60 percent of its handset base.

- b. discuss in detail whether those devices require Over-the-Air (OTA) device software updates to enable the MOCN feature;***

T-Mobile devices will not use MOCN and will not require any updates. Sprint devices operating in compatible spectrum bands and using LTE will not require any software updates to utilize MOCN. MOCN does not require an OTA software update as this feature is enabled on the network side not at the device.

- c. state how many, and what percentage of, Sprint and T-Mobile devices (retail, prepaid and wholesale) will need OTA software updates to work on both networks;***

No devices will require OTA software updates.

- d. state how many, and what percentage of, Sprint devices are not compatible with the feature, and provide all documents related to transitioning users of those devices;***

T-Mobile does not have any documents on the number of Sprint devices that are compatible with LTE and the T-Mobile spectrum. Once the transaction is finalized, detailed discussions will include determination of the number of Sprint devices that cannot utilize MOCN. However, the expectation is that this number will continue to decline as the parties move toward the closing of the Transaction, as more than 60 percent of Sprint consumer devices are LTE-capable and would have compatibility with at least one of the T-Mobile spectrum bands.

- e. discuss in detail how New T-Mobile plans to address non-compatible devices; and*

The small number of Sprint customers with devices that are not compatible with MOCN will continue to connect with the existing Sprint radio network. New T-Mobile will not be decommissioning existing Sprint cell sites until existing customers have devices that are fully compatible with the new network and there is capacity on the new network to manage the additional customer traffic. Customers who upgrade devices during the migration period would receive devices that are fully compatible with the New T-Mobile network. The overall customer migration process (to migrate all Sprint customers to the New T-Mobile network) will be managed on a market-by-market basis and should be completed within three years after close of the transaction.

- f. provide all documents reviewed and relied upon to answer a.-e.*

As the MOCN feature is built into the existing standard LTE chip, and T-Mobile used this same functionality during the MetroPCS customer migration, there are no documents that were reviewed or relied upon to answer these questions. Detailed discussions about implementation of MOCN and managing the Sprint customer transition will not occur until close of the transaction.

- 44. In his declaration, Dr. Eisenach estimates that the employment effects of the Proposed Transaction “show[] that it will contribute a cumulative total of approximately 51,200 job-years to the U.S. economy in the five years following consummation (2019-2023).” (Eisenach Declaration, para. 11). Further, he estimates that “accelerated 5G**

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*deployment will contribute an additional 73,600 job-years from 2021 through 2023.” (Eisenach Declaration, para. 12).*

- a. provide all documents, including the underlying IMPLAN model, and associated data utilized, reviewed, or relied upon by Dr. Eisenach in arriving at these estimates;*

Documents and data provided by Dr. Eisenach as documents he utilized, reviewed, or relied upon for his estimates have been provided as part of the Document Production with “Jeffrey Eisenach” as the applicable custodian.

A complete Excel version of Dr. Eisenach’s IMPLAN model is provided in the folder titled “Specification 44(a)” on the Economic DVD-ROM (“Spec 44 Folder”). The Excel file shows all calculations and specifies each source used to calculate the employment effects from the IMPLAN model.

The “Summary” tab summarizes the annual employment estimates from the IMPLAN model separately for capex, opex and growth opportunities by direct, indirect, induced and total employment. The “IMPLAN Results” tab shows Transaction-specific, employment-related changes in expenditures and revenues adjusted for inflation, IMPLAN employment multipliers and direct, indirect, induced and total employment effects by category of capex, opex and growth opportunities.

The tabs following the “>>intermediate>>” tab and preceding the “>>Pro Forma Business Plan>>” tab contain intermediate data supporting the “IMPLAN Results” tab. The “Adjustments” tab shows how the raw expenditure and revenue data from tabs “Synergy Timing (NERA)” and “Synergy Timing, net of cost” are adjusted to obtain the expenditures and revenues that are employment-related, as explained in Exhibit C of Dr. Eisenach’s declaration. The “Deflators” tab shows the Consumer Price Index (CPI) for all urban consumers from 2016 to



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2023 and the deflators calculated from them which are used to adjust expenditures and revenues to 2016 dollars for use with the 2016-based IMPLAN model. The “Multipliers” tab shows the direct, indirect, induced and total IMPLAN employment multipliers by category of capex, opex and growth opportunities along with a short description of the IMPLAN industry sector to which the expenditures or revenues in those categories are assigned. For categories that represent multiple sectors, the weight of each sector is shown and weighted average multipliers are calculated based on those weights. In these cases, the weighted average multipliers are shown in the same row as the category name. The “Sources” and “Notes” sections beginning in Rows 48 and 81, respectively, provide information on the data sources and assumptions used to assign each category to an IMPLAN sector.

The tabs following the “>>Pro Forma Business Plan>>” tab and preceding the “>>IMPLAN>>” tab contain raw data supporting the intermediate data. The tab “Synergy Timing (NERA)” is sourced directly from “18.05.29 Cost sub-component breakout for NERA v01.xlsx” and contains data on capex and opex synergies, dis-synergies and costs to achieve resulting from the Proposed Transaction for the following categories: Network; Back Office IT & Billing; Back Office Other Fixed G&A and Sales, Service and Marketing. Sales, Service and Marketing is further broken out into the separate subcategories of Store Consolidation, Increased Lease, Increased Labor, Store Refresh Cost, Dealer Opportunity, Advertising, Customer Care, Equipment Expense and Repair & Logistics. The tab “Synergy Timing, net of cost” is sourced directly from “18.05.29 Growth Opportunity Breakdown for NERA v02.xlsx” and contains data on revenues and capex and opex synergies, dis-synergies and costs to achieve resulting from the Proposed Transaction for the following categories: Customers, Rural, Enterprise, Home Broadband Replacement, Video and IoT.

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The tabs following the “>>IMPLAN>>” tab and preceding the “>>T-Mobile Jobs Analysis >>” tab contain data from the IMPLAN software. The tab “IMPLAN Multipliers” was exported directly from the IMPLAN software and contains 2016-based direct, indirect, induced and total employment multipliers for 536 industry sectors. The tab “IMPLAN-NAICS Sector Search” is copied directly from the IMPLAN software and contains IMPLAN industry codes and North American Industry Classification System (NAICS) codes for 18,070 industry sectors. This was used as a reference for the mapping of expenditure and revenue categories to IMPLAN industry sectors in the “Multipliers” tab.

The tabs following the “>>T-Mobile Jobs Analysis>>” tab come from T-Mobile’s internal analysis of post-Transaction changes in direct employment in “Joint Jobs Model\_v16 04Apr2018\_v14\_20180507\_build7.5\_comm.xlsx.” The tab “5. CTA” shows T-Mobile’s calculation of employment by category of capex and opex costs to achieve. The expenditures used in this tab in the employment calculation for Network Opex Costs to Achieve related to decommissioning sites (row 152) are used in the IMPLAN model to calculate employment effects from Network Opex Costs to Achieve. Dr. Eisenach uses these expenditures rather than the raw values for Network Opex Costs to Achieve in “Synergy Timing (NERA),” because the “Synergy Timing (NERA)” values include expenditures which are not employment-related.

The tab “7. Network Opex” shows T-Mobile’s calculation of employment lost because of Network Opex Synergies. At the bottom of the tab (rows 70-106), highlighted in yellow, are additional calculations performed by NERA using the data above to limit to employment-related Network Opex Synergies and calculate the proportion of those synergies associated with different industry sectors. These employment-related synergies are used in the IMPLAN model rather than the raw values for Network Opex Synergies in “Synergy Timing (NERA),” because

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the “Synergy Timing (NERA)” values include expenditures which are not employment-related. The proportion of synergies associated each different industry sector is used to calculate weighted average employment multipliers for Network Opex Synergies in the “Multipliers” tab. (Compare cells M104-M106 in Tab “7. Network Opex” to cells D22-D24 in the “Multipliers” tab.)

A complete Excel version of Dr. Eisenach’s estimate of the employment effects of accelerated 5G deployment resulting from the Proposed Transaction is provided in Exhibit 44(a)-2 in the Spec 44 Folder. The Excel file shows all calculations and specifies each source used to calculate the employment effects of accelerated 5G deployment resulting from the Proposed Transaction.

The tab “IMPLAN + 5G” shows employment effects of the Proposed Transaction estimated from Transaction-specific changes in capex, opex and growth opportunity revenues in the IMPLAN model and Dr. Eisenach’s analysis of the employment effects of accelerated 5G deployment based on Shapiro and Hassett (2012).

The tab “Accelerated 5G Employment” shows the calculation of Transaction-specific quarterly increases in employment enabled by 5G from 2021 to 2023. The calculation is based on the coefficients from Shapiro and Hassett (2012), projected employment levels and estimated changes in 5G penetration resulting from the Proposed Transaction. The coefficient estimates from the study are reproduced in Response to Request 44(e).

The tab “ $\Delta$ 5G Penetration” shows estimated quarterly changes in 5G penetration resulting from the Proposed Transaction using T-Mobile’s projections of 5G subscriber counts and total subscriber counts with and without the Transaction. These quarterly estimates are used in tab

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“Accelerated 5G Employment” in the calculation of Transaction-specific quarterly increases in employment enabled by 5G.

The tabs following the “>>data>>” tab and preceding the “>>T-Mobile Jobs Analysis>>” tab contain data used in the calculations in tabs “Accelerated 5G Employment” and “Δ5G Penetration.” The tab “5G Subs Standalone vs. NewCo” contains T-Mobile’s projections of 5G subscribers without the Transaction for standalone T-Mobile and Sprint and with the Transaction for the combined firm, which are used in tab “Δ5G Penetration” to calculate changes in 5G penetration resulting from the Proposed Transaction.

The tab “Employment 2016-2026” shows how the Bureau of Labor Statistics’ (BLS) projection of employment growth between 2016 and 2026 was distributed over the quarters in 2021 through 2023 to produce the estimated employment levels shown in tab “Accelerated 5G Employment.”

The tab “S+T inputs,” which follows tab “>>T-Mobile Jobs Analysis>>,” comes from T-Mobile’s internal analysis of post-Transaction changes in direct employment in “Joint Jobs Model\_v16 04Apr2018\_v14\_20180507\_build7.5\_comm.xlsx.” It includes projections of total subscribers with and without the Proposed Transaction (rows 41-46), which are used in tab “Δ5G Penetration” to calculate changes in 5G penetration resulting from the Proposed Transaction.

A complete set of documents and data utilized, reviewed or relied upon by Dr. Eisenach in arriving at these estimates is included in the enclosed “Backup” subfolder within the Spec 44 Folder.

***b. provide the charts in Dr. Eisenach’s declaration in csv format;***

The data supporting the charts in Dr. Eisenach’s declaration are provided in csv format in Exhibits 44(b)-1 through 44(b)-14 in the Spec 44 Folder. Exhibits 44(b)-1 through 44(b)-14

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contain the figures and tables in the order in which they appear in the declaration (*e.g.*, Exhibit 44(b)-1 corresponds to Figure 1 and Exhibit 44(b)-14 corresponds to Figure F-1).

- c. define the “change in generational penetration” variable, and explain in detail how that study supports Dr. Eisenach’s analysis. (Eisenach Declaration, para. 46, fn. 47, citing to an analysis by Dr. Shapiro and Dr. Hassett);*

The “change in generational penetration variable” ( $\Delta\text{GenPen}$ ) used in the January 2012 study by Dr. Shapiro and Dr. Hassett is the sum of state-level quarterly changes in 2.5G (EDGE, CDMA 1x), GPRS and 3G (UMTS, CDMA EVDO) penetration rates and “represents the change in cumulative cell phone generational penetration.” It is a measure of the increased adoption by consumers of more advanced mobile wireless technology. The following example illustrates how the statistic is calculated.

The world has ten people with mobile phones, where three have 2G phones, five have 2.5G phones and two have 3G phones. The 2.5G and 3G phones offer backward compatibility, so all include 2G technologies and the 3G phones also include 2.5G technologies. Therefore, all ten people have 2G-compatible phones and seven people have 2.5G-compatible phones, and the 2G penetration rate is 100 percent, the 2.5G penetration rate is 70 percent and the 3G penetration rate is 20 percent. In the following quarter, one person has a 2G phone, four have 2.5G phones and five have 3G phones. Again, taking into account backward compatibility, all ten have 2G-compatible phones and nine have 2.5G compatible phones. The 2G penetration rate is 100 percent, the 2.5G penetration rate is 90 percent and the 3G penetration rate is 50 percent. In this scenario, because 2G is the base technology and 2.5G and 3G are the more advanced technologies, only changes in 2.5G and 3G penetration are included in  $\Delta\text{GenPen}$ . Since the previous quarter the 2.5G penetration rate increased 20 percent (from 70 to 90 percent) and the 3G penetration rate increased 30 percent (from 20 to 50 percent), so  $\Delta\text{GenPen}$  for the quarter is

50 percent (20 + 30 percent). Note that the variable constructed by Dr. Eisenach based on T-Mobile's projections of 5G subscribership is definitionally identical to  $\Delta$ GenPen as calculated by Shapiro and Hassett.

In the Shapiro and Hassett (2012) analysis, the regression coefficients on the lagged change in generational penetration variables quantify the employment effects of the transition from 2G to higher generations of mobile wireless technology, especially 3G. Shapiro and Hassett then use these coefficients to estimate the effect of continued adoption of newer generations of mobile wireless technology on employment within the United States. Shapiro and Hassett show, based on employment in the third quarter of 2011, that each ten percentage point increase in the adoption of new generation cell phones in a given quarter would add 231,690 jobs to the American economy over the following three quarters. Thus, Shapiro and Hassett provide an empirical basis for assessing the employment effects of advances in mobile wireless technology, and Dr. Eisenach uses their coefficient estimates to estimate the Transaction-specific employment effects created through the Transaction's predicted effect on 5G adoption. The procedure Dr. Eisenach uses to project the employment effects of more rapid 5G adoption are described in detail in paragraphs 47-56 of his declaration.

***d. describe what Dr. Eisenach did to test the fixed-coefficients assumption implicit in input-output analysis; and***

Dr. Eisenach did consider the implications of changes in industry-level input-output relationships on his estimate of employment effects based on the IMPLAN model. As explained in paragraph 10 of his declaration, he concluded that these changes are unlikely to be significant over the short time period of his analysis (2019-2023).

In addition, Dr. Eisenach compared his direct employment estimates to those from T-Mobile's internal projections of post-Transaction changes in direct employment for comparable categories of expenditure. He found that the estimates between the two analyses do not differ to a significant degree. Thus, T-Mobile's internal business projections support Dr. Eisenach's conclusion that there would not be material changes in input-output relationships over the five-year period of analysis.

*e. produce Dr. Eisenach's regression output regarding his attempt to implement the Hassett and Shapiro procedure.*

As explained in response to Request 44(c), Dr. Eisenach directly applied the coefficients estimated by Shapiro and Hassett.<sup>22</sup> The table of coefficient estimates from Shapiro and Hassett (2012) is reproduced below and can also be found on page 19 of the copy of the study attached as responsive to Request 44(a). In following Shapiro and Hassett, Dr. Eisenach uses the coefficients under the first specification (column (1)). A detailed description of how the coefficients are applied is provided in the Response to Request 44(c).

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<sup>22</sup> Eisenach Declaration at ¶51 and ¶54, n. 54-56.

Shapiro and Hassett (2012) Regression Results with State and Time Fixed Effects

Variable	$\Delta (\log (\text{Employment})) (1)$	$\Delta (\log (\text{Employment})) (2)$
$\Delta (\log (\text{Employment}_{i(t-1)}))$	0.165*** (0.0519)	0.249*** (0.0473)
$\Delta (\log (\text{Employment}_{i(t-3)}))$	0.196*** (0.0400)	0.304*** (0.0335)
$\Delta (\log (\text{Employment}_{i(t-3)}))$	0.00729 (0.0418)	0.120*** (0.0402)
$\Delta (\text{GenPen}_{i(t-1)})$	0.00700*** (0.00225)	0.00612*** (0.00224)
$\Delta (\text{GenPen}_{i(t-2)})$	0.00581* (0.00292)	0.00460 (0.00275)
$\Delta (\text{GenPen}_{i(t-3)})$	0.00483* (0.00250)	0.00408* (0.00222)
Constant	-0.00217*** (0.000688)	-0.00124 (0.000751)
State Fixed Effects	Yes	No
Time Fixed Effects	Yes	Yes
Observations	750	750
R-Squared	0.854	0.840
Robust Standard Errors in parenthesis		
*** p < 0.01; ** p < 0.05; * p < 0.1		

45. *The Applicants claim that, in its initial three years, New T-Mobile will invest significantly more in network infrastructure, which “will translate into thousands of additional American jobs, as New T-Mobile will need to hire employees to build the new network; extend the Un-carrier customer care model to a wider subscriber base; and support growing services like in-home broadband and IoT. The result is that New T-Mobile will be jobs positive from its first year and beyond, with an initial increase relative to the combined companies’ standalone of more than 3,000 jobs that increases to 11,000 jobs by 2024.” (Public Interest Statement, pages 80-81). Provide all plans, analyses, and reports discussing the creation or loss of jobs if the Proposed Transaction were to be consummated.*

Documents responsive to *Specification 45* are in the Document Production.

46. *Provide all documents discussing competition, pricing, or network investment in countries other than the United States, including, but not limited to, documents discussing comparisons between markets for wireless services in the United States and elsewhere.*

Documents responsive to *Specification 46* are in the Document Production.



47. *The Applicants state that low-band spectrum “can support cell site operating radii of up to 18 miles”; mid-band spectrum cell site operating areas “would be reduced to approximately 4 miles”; and high-band, mmW spectrum (above 20 GHz) is preferable in dense urban markets as “cell operating areas are significantly less than half a mile.” (Public Interest Statement, pages 32-33). Provide all documents, including RF link budgets, assumptions, studies, and RF propagation models related to the operating radii of these spectrum bands.*

Documents responsive to *Specification 47* are in the Document Production.

48. *Provide a detailed description of deployed backhaul by technology, number of sites for each technology, as well as link capacity available by technology. Explain the spectrum band(s) that T-Mobile uses for wireless backhaul and how that compares to fiber backhaul in terms of availability at sites, traffic carried, latency, and capacity. Discuss in detail the Applicants’ plans to upgrade the backhaul transport to support New T-Mobile’s projected increases in capacity and throughput.*

The vast majority of T-Mobile cell sites use a fiber connection that provides Ethernet backhaul (approximately [REDACTED] of sites). The remaining cell sites are accommodated with wireless backhaul (fixed microwave links). T-Mobile has slightly more than [REDACTED] served by fiber/Ethernet in its network, slightly more than [REDACTED] served by microwave links, approximately [REDACTED] served by T-1 wired connections, and approximately [REDACTED] served by satellite systems.

The fiber/Ethernet backhaul varies in capacity depending upon cell site need and ranges from 1 Mbps to 10 Gbps. The terrestrial wireless backhaul varies in capacity from 1 Mbps to 10 Gbps. The satellite backhaul varies in capacity from 50 to 400 Mbps.

For wireless backhaul, T-Mobile uses spectrum in the 6, 11, 18 and 23 GHz bands. There are approximately 4500 microwave paths (either licensed or in the process of being licensed) and nearly 250 paths on legacy TDM microwave equipment that is in the decommissioning stage. There are approximately 460 microwave paths in the 6 GHz band, 2300 paths in the 11 GHz band, 1000 paths in the 18 GHz band, and 650 paths in the 23 GHz band. T-Mobile designs its

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microwave backhaul to perform at nothing less than [REDACTED] which is the same as the fiber network contracts. There is negligible difference between microwave and fiber backhaul in latency as most latency is introduced through the fiber provider's long haul network. T-Mobile's microwave backhaul network on a per site basis is currently limited to one Gbps because of the current microwave equipment port restrictions. Higher band frequencies (above 60 GHz) can support up to 10 Gbps but T-Mobile is not currently utilizing this spectrum for more than field trials.

New T-Mobile will deliver unprecedented capacity and throughput through its new 5G network. A key component of this effort will be the backhaul transport from the New T-Mobile cell sites. At the cell edge, backhaul throughput capacity will have to be upgraded. Cell site routers that enable 5G will need to be upgraded to a new router to achieve 10 Gbps throughput. Each cell site requiring an upgrade might require router upgrades, card upgrades, fiber over-lashing, and services.

T-Mobile is planning to deploy high capacity/high throughput millimeter wave solutions for links greater than 0.5 mile (up to 10 Gbps) for its wireless backhaul network. For links less than 0.5 miles and greater than 9 miles, a multi-band deployment solution will be used with existing microwave frequency coupled with millimeter wave solutions to maintain the [REDACTED]. Utilizing this multi-band solution in these scenarios allows T-Mobile to maintain capacity/throughputs of up to 10 Gbps on the link. For links greater than 9 miles, T-Mobile plans to upgrade existing microwave solutions with higher capacity nodes with greater modulations and channel size upgrades coupled with channel and/or carrier additions to increase link capacities to support future needs.

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- 49. *To the extent not already provided, provide all documents cited in the Public Interest Statement and the attached declarations, and any data, documents, or analyses provided to, reviewed by, or relied upon in preparing those declarations, grouped by declaration/Public Interest Statement.***

Documents responsive to *Specification 49* are in the Document Production. There were additional reference materials that were provided after the time limit for including materials within the Document Production that have been included in a folder “Specification 49” on both the Economic DVD-ROMs. Those materials will be added to the document production to be produced to the FCC on September 24, 2018.

Exhibit A — Priority and Non-Priority and Key Custodians

The table contains approximately 25 rows and 3 columns. The first column is highlighted in red. The second and third columns contain redacted information, with some cells in the top three rows also highlighted in red. The remaining rows in the second and third columns are only partially redacted, showing some text before being cut off by black boxes.

[Redacted]

**Exhibit B — Specification 3 Database List**

Below is a summary of the databases that contain information responsive to Specification 3. The summary is organized by the following categories of data: (i) customer data, (ii) engineering data, (iii) wholesale M2M / MVNO data, and (iv) financial data. In each category, this summary starts with “sources of record” (that provide real time support to T-Mobile) and proceeds to analytical databases (that the Company uses to make business decisions). This is necessarily a high-level summary, intended to further the discussion about the databases from which information will be pulled in response to Specification 3.

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Exhibit C — Major Pricing, Plan and Promotional Actions

Date	Description	Link	Strategy/Rationale
5/17/2012	Launch new No Annual Contract mobile broadband passes (300MB, 1.5GB, 3.5GB, 5GB monthly data passes) for consumers.	<a href="https://www.t-mobile.com/news/t-mobile-introduces-new-no-annual-contract-mobile-broadband">https://www.t-mobile.com/news/t-mobile-introduces-new-no-annual-contract-mobile-broadband</a>	[REDACTED]
6/27/2012	Launch new 500MB, 2GB, 5GB and 10GB mobile internet plans for business customers.	<a href="https://www.t-mobile.com/news/t-mobile-rolls-out-new-business-focused-mobile-broadband-data">https://www.t-mobile.com/news/t-mobile-rolls-out-new-business-focused-mobile-broadband-data</a>	[REDACTED]
7/15/2012	Launch “Open Europe” flat rate unlimited data feature for business customers.	<a href="https://www.t-mobile.com/news/t-mobile-to-roll-out-open-europe-plan-for-business-customers">https://www.t-mobile.com/news/t-mobile-to-roll-out-open-europe-plan-for-business-customers</a>	[REDACTED]
9/5/2012	Launch Unlimited Nationwide 4G Data Plan.	<a href="https://www.t-mobile.com/news/t-mobile-celebrates-10-years-of-innovation-with-launch-of-4g">https://www.t-mobile.com/news/t-mobile-celebrates-10-years-of-innovation-with-launch-of-4g</a>	[REDACTED]
<b>2013</b>			
1/9/2013	Modify Unlimited Nationwide 4G Data Plan to remove the annual service contract requirement.	<a href="https://www.t-mobile.com/news/t-mobile-shakes-up-the-wireless-industry-by-expanding-unlimited">https://www.t-mobile.com/news/t-mobile-shakes-up-the-wireless-industry-by-expanding-unlimited</a>	[REDACTED]

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Date	Description	Link	Strategy/Rationale
			<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
3/25/2013	<p><b>[Un-carrier 1] Simple Choice / No Annual Service Contracts</b> - Launch new Simple Choice plans with no annual contracts, caps, or overages, and varying amounts of included high-speed data.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-makes-bold-un-carrier-moves">https://www.t-mobile.com/news/t-mobile-makes-bold-un-carrier-moves</a></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
4/28/2013	<p>Launch Simple Choice plans for small business.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-offers-simple-choice-plan-to-small-businesses">https://www.t-mobile.com/news/t-mobile-offers-simple-choice-plan-to-small-businesses</a></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
5/1/2013	<p>Launch new international flat-rate data plans (T-Mobile International Flat-Rate Plan and T-Mobile North America Flat-Rate Plan) for business customers</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-addresses-challenges-of-international-mobility-for">https://www.t-mobile.com/news/t-mobile-addresses-challenges-of-international-mobility-for</a></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
7/19/2013	<p><b>[Un-carrier 2] JUMPI</b> - phone upgrade program, enabling customers to upgrade when they want, up to twice a year.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-announces-boldest-moves-yet-as-americas-un-carrier">https://www.t-mobile.com/news/t-mobile-announces-boldest-moves-yet-as-americas-un-carrier</a></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>
7/19/2013	<p>Launch Simple Choice family plan (4 lines, 500MB high-speed data for \$100) with no credit check required.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-announces-boldest-moves-yet-as-americas-un-carrier">https://www.t-mobile.com/news/t-mobile-announces-boldest-moves-yet-as-americas-un-carrier</a></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>

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Date	Description	Link	Strategy/Rationale
8/21/2013	Launch new Simple Choice plans for business (Simple Choice for Business and Simple Choice Classic)	<a href="https://www.t-mobile.com/news/t-mobile-changes-way-business-does-wireless-with-new-simple">https://www.t-mobile.com/news/t-mobile-changes-way-business-does-wireless-with-new-simple</a>	[REDACTED]
10/8/2013	[Un-carrier 3] Simple Global - benefit that gives customers international unlimited data/texting included at no extra charge.	<a href="https://www.t-mobile.com/news/t-mobile-makes-the-world-your-network-at-no-extra-charge-and-4g">https://www.t-mobile.com/news/t-mobile-makes-the-world-your-network-at-no-extra-charge-and-4g</a>	[REDACTED]
10/8/2013	Launch Stateside International talk & text feature – caps calling rates from U.S. at \$0.20/minute.		[REDACTED]
10/23/2013	[Un-carrier 3.5] Free Data for Life tablet promo (200MB free LTE data/mo. for as long as you own certain tablets)	<a href="https://www.t-mobile.com/news/t-mobile-un-leashes-ipad-air-nov-1-starting-at-0-down-with-free">https://www.t-mobile.com/news/t-mobile-un-leashes-ipad-air-nov-1-starting-at-0-down-with-free</a>	[REDACTED]

2014

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Date	Description	Link	Strategy/Rationale
1/8/2014	<p><b>[Un-carrier 4] Contract Freedom</b>                      – reimburse customers' early termination fees when they switch from AT&amp;T, Sprint, or Verizon.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-delivers-contract-freedom-for-families-by-paying-off">https://www.t-mobile.com/news/t-mobile-delivers-contract-freedom-for-families-by-paying-off</a></p>	<p>[REDACTED]</p>
3/6/2014	<p>Simple Choice plans upgraded to include more 4G LTE data for no extra charge</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-doubles-down-on-flagship-simple-choice-plan-with-more">https://www.t-mobile.com/news/t-mobile-doubles-down-on-flagship-simple-choice-plan-with-more</a></p>	<p>[REDACTED]</p>
4/9/2014	<p><b>[Un-carrier 4.5]</b> Launch Simple Starter plan (1 line with 500MB 4G LTE data for \$40/mo.)</p>	<p><a href="https://www.t-mobile.com/news/day-1-of-3-t-mobile-on-a-roll-again-with-multiple-initiatives-of">https://www.t-mobile.com/news/day-1-of-3-t-mobile-on-a-roll-again-with-multiple-initiatives-of</a></p>	<p>[REDACTED]</p>
4/13/2014	<p><b>[Un-carrier 4.5]</b> Remove all overage penalties from rate plans</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-abolishes-consumer-overages-challenges-other-wireless">https://www.t-mobile.com/news/t-mobile-abolishes-consumer-overages-challenges-other-wireless</a></p>	<p>[REDACTED]</p>
6/17/2014	<p><b>[Un-carrier 5] Test Drive</b> - program that allows non-T-Mobile customers to try our network on an iPhone 5 for seven days.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-transforms-the-way-americans-buy-wireless-again">https://www.t-mobile.com/news/t-mobile-transforms-the-way-americans-buy-wireless-again</a></p>	<p>[REDACTED]</p>

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Date	Description	Link	Strategy/Rationale
6/18/2014	<p><b>[Un-carrier 6] Music Freedom</b> - allows Simple Choice customers to stream as much music as they want from included services without it counting against their data cap.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-sets-your-music-free">https://www.t-mobile.com/news/t-mobile-sets-your-music-free</a></p>	<p>[REDACTED]</p>
6/23/2014	<p>Add new Rhapsody UnRadio music streaming feature as a benefit for Simple Choice unlimited plans.</p>	<p><a href="https://www.t-mobile.com/news/t-mobile-rhapsody-introduce-unradio">https://www.t-mobile.com/news/t-mobile-rhapsody-introduce-unradio</a></p>	<p>[REDACTED]</p>
8/5/2014	<p>Expand Simple Starter plan options to include additional 2GB LTE data for an extra \$5/mo.</p>	<p><a href="https://www.t-mobile.com/news/4x-the-data">https://www.t-mobile.com/news/4x-the-data</a></p>	<p>[REDACTED]</p>
8/26/2014	<p>Expand Simple Choice additional line pricing to up to 10 lines (was previously limited to 5 lines)</p>	<p><a href="https://www.t-mobile.com/news/10-line-family-plan">https://www.t-mobile.com/news/10-line-family-plan</a></p>	<p>[REDACTED]</p>
8/27/2014	<p>Expand Music Freedom benefit for Simple Choice customers to include 6 additional streaming services.</p>	<p><a href="https://www.t-mobile.com/news/music-streaming-momentum-update">https://www.t-mobile.com/news/music-streaming-momentum-update</a></p>	<p>[REDACTED]</p>



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Date	Description	Link	Strategy/Rationale
9/10/2014	[Un-carrier 7] Wi-Fi Unleashed – launch free Gogo in-flight texting/voicemail benefit and Personal CellSpot (to improve cellular coverage in your home)	<a href="https://www.t-mobile.com/news/t-mobile-launches-un-carrier-7">https://www.t-mobile.com/news/t-mobile-launches-un-carrier-7</a>	[REDACTED]
11/19/2014	Modify Stateside International Talk feature to give unlimited calling from U.S. to 70+ countries for \$5-10/mo.	<a href="https://www.t-mobile.com/news/t-mobile-makes-calling-those-abroad-affordable-worry-free">https://www.t-mobile.com/news/t-mobile-makes-calling-those-abroad-affordable-worry-free</a>	[REDACTED]
11/23/2014	Expand Music Freedom benefit for Simple Choice customers to include 14 additional streaming services.	<a href="https://www.t-mobile.com/news/more-music-freedom">https://www.t-mobile.com/news/more-music-freedom</a>	[REDACTED]
12/9/2014	Launch new Simple Choice unlimited 4G LTE family plan offer (\$100 for 2 lines; \$40 for each additional line)	<a href="https://www.t-mobile.com/news/unlimited-family-plan">https://www.t-mobile.com/news/unlimited-family-plan</a>	[REDACTED]
12/9/2014	Launch new Simple Choice unlimited 4G LTE offer for business (Simple Choice - \$100 for two employees and only \$40 more per employee)	<a href="https://www.t-mobile.com/news/t-mobile-offers-unlimited-4g-lte-data-for-businesses-too">https://www.t-mobile.com/news/t-mobile-offers-unlimited-4g-lte-data-for-businesses-too</a>	[REDACTED]
12/15/2014	[Un-carrier 8] Launch Data Stash feature for Simple Choice postpaid plans – unused data rolls forward & each Data Stash starts with 10GB of LTE data.	<a href="https://www.t-mobile.com/news/un-carrier-8">https://www.t-mobile.com/news/un-carrier-8</a>	[REDACTED]

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Date	Description	Link	Strategy/Rationale
2015			
1/14/2015	Launch Simply Prepaid prepaid plan	<a href="https://www.t-mobile.com/news/simple-prepaid">https://www.t-mobile.com/news/simple-prepaid</a>	
3/15/2015	Data Stash benefit extended to prepaid Simple Choice customers.	<a href="https://www.t-mobile.com/news/prepaid-data-stash">https://www.t-mobile.com/news/prepaid-data-stash</a>	
3/17/2015	<b>[Un-carrier 9] Carrier Freedom</b> announce (extending Contract Freedom program to include switching customers' outstanding device finance payments) as well as the "Un-contract" (prices for certain plans guaranteed indefinitely; price for unlimited LTE guaranteed for 2 years) and Un-Carrier for Business	<a href="https://www.t-mobile.com/news/uncontract-carrier-freedom">https://www.t-mobile.com/news/uncontract-carrier-freedom</a> <a href="https://www.t-mobile.com/news/uncarrier-for-business">https://www.t-mobile.com/news/uncarrier-for-business</a>	
6/24/2015	Launch JUMP! On Demand program, allowing customers to lease handsets and upgrade whenever they want, up to 3 times a year	<a href="https://www.t-mobile.com/news/t-mobile-unveils-all-new-jump-on-demand--a-whole-new-way-to-get">https://www.t-mobile.com/news/t-mobile-unveils-all-new-jump-on-demand--a-whole-new-way-to-get</a>	
7/8/2015	Launch Mobile Without Borders – adds high speed data roaming while in Canada/Mexico at no additional cost; in addition to unlimited talk/text via Simple Global. Calls & texts to Canada/Mexico from U.S. have no extra fee.	<a href="https://www.t-mobile.com/news/mobile-without-borders">https://www.t-mobile.com/news/mobile-without-borders</a>	

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Date	Description	Link	Strategy/Rationale
7/13/2015	Un-carrier "Amped" announcement - new family plan pricing – 2 lines of 10GB for \$100 w/ \$20 line for each additional line. Limited time promo gives you 4 <sup>th</sup> line free (ie., 4 lines for \$120).	<a href="https://www.t-mobile.com/news/t-mobile-amps-up-its-family-plan-family-members-get-10gb-each--a">https://www.t-mobile.com/news/t-mobile-amps-up-its-family-plan-family-members-get-10gb-each--a</a>	[REDACTED]
9/9/2015	Launch Lifetime Coverage Guarantee – unsatisfied JUMP! On Demand customers can get a refund in the first month, get their phone unlocked, and continue leasing their device.	<a href="https://www.t-mobile.com/news/lifetime-coverage-guarantee-news">https://www.t-mobile.com/news/lifetime-coverage-guarantee-news</a>	[REDACTED]
11/10/2015	[Un-carrier X] Binge On – new benefit for Simple Choice customers. When on, video is optimized to stream at DVD quality (480p or better) enabling up to 3X data savings. Streaming video from any content provider that wants to participate is also whitelisted so that it does not count against your data limit.	<a href="https://www.t-mobile.com/news/t-mobile-unleashes-mobile-video-with-binge-on">https://www.t-mobile.com/news/t-mobile-unleashes-mobile-video-with-binge-on</a>	[REDACTED]
11/30/2015	Expand Music Freedom benefit for Simple Choice customers to include 11 additional streaming services.	<a href="https://www.t-mobile.com/news/eleven-more-music-services-join-t-mobiles-music-freedom">https://www.t-mobile.com/news/eleven-more-music-services-join-t-mobiles-music-freedom</a>	[REDACTED]
<b>2016</b>			
3/17/2016	50 additional services added to Binge On benefit	<a href="https://www.t-mobile.com/news/binge-on-amped-again">https://www.t-mobile.com/news/binge-on-amped-again</a>	[REDACTED]
4/5/2016	Additional services added to Binge On benefit	<a href="https://www.t-mobile.com/news/binge-on-music-freedom-new-services">https://www.t-mobile.com/news/binge-on-music-freedom-new-services</a>	[REDACTED]

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Date	Description	Link	Strategy/Rationale
5/17/2016	Additional services added to Binge On benefit	<a href="https://www.t-mobile.com/news/binge-on-adds-more-cowbell">https://www.t-mobile.com/news/binge-on-adds-more-cowbell</a>	[REDACTED]
6/6/2016	<b>[Un-carrier 11] Get Thanked -</b> Launch T-Mobile Tuesdays app (gives customers gifts every week), Stock Up (offers a share of TMUS stock to current customers), and upgrade Gogo benefit so that customers get 1 hour of free in-flight Wi-Fi on top of texting/voicemail benefit they already had.	<a href="https://www.t-mobile.com/news/un-carrier-11">https://www.t-mobile.com/news/un-carrier-11</a>	[REDACTED]
7/26/2016	Additional services added to Binge On benefit	<a href="https://www.t-mobile.com/news/binge-on-100-providers">https://www.t-mobile.com/news/binge-on-100-providers</a>	[REDACTED]
8/18/2016	<b>[Un-carrier 12] T-Mobile ONE –</b> new rate plan with just one LTE data option: unlimited.	<a href="https://www.t-mobile.com/news/rip-data-plans">https://www.t-mobile.com/news/rip-data-plans</a>	[REDACTED]
8/29/2016	T-Mobile ONE tethering speed increased, new HD day passes for T-Mobile ONE introduced. New T-Mobile ONE Plus add-on launched for customers who want higher tethering speeds, faster international speeds, and HD video.	<a href="https://www.t-mobile.com/news/t-mobile-one-amped">https://www.t-mobile.com/news/t-mobile-one-amped</a>	[REDACTED]
12/20/2016	T-Mobile ONE Plus add-on modified to include some new benefits. New T-Mobile ONE Plus <i>International</i> add-on launched.	<a href="https://www.t-mobile.com/news/t-mobile-shakes-things-up-with-t-mobile-one-plus">https://www.t-mobile.com/news/t-mobile-shakes-things-up-with-t-mobile-one-plus</a>	[REDACTED]

2017

**REDACTED – FOR PUBLIC INSPECTION**

Date	Description	Link	Strategy/Rationale
1/4/2017	<p>[Un-carrier Next] T-Mobile ONE pricing is now inclusive of taxes and fees. Launch Kickback feature that gives you a \$10/mo. credit if you use less than 2GB/mo. of LTE data. Introduce Un-contract for T-Mobile ONE. \$150/line rebate for lines switched to T-Mobile ONE.</p>	<p><a href="https://www.t-mobile.com/news/un-carrier-next">https://www.t-mobile.com/news/un-carrier-next</a></p>	<p>[REDACTED]</p>
5/24/2017	<p>Launch DIGITS rate plans, which allow you to use one phone number on multiple devices or multiple phone numbers on one device.</p>	<p><a href="https://www.t-mobile.com/news/digits-launch">https://www.t-mobile.com/news/digits-launch</a></p>	<p>[REDACTED]</p>
7/6/2017	<p>T-Mobile ONE Plus add-on increased from \$5/mo. to \$10/mo.</p>		<p>[REDACTED]</p>
8/6/2017	<p>Launch Unlimited 55+ plan – discounted 2 lines of unlimited for \$60 for customers 55 and older.</p>	<p><a href="https://www.t-mobile.com/news/unlimited-55">https://www.t-mobile.com/news/unlimited-55</a></p>	<p>[REDACTED]</p>
8/8/2017	<p>JUMP! On Demand lease program expanded to include lower-end, more affordable devices.</p>	<p><a href="https://www.t-mobile.com/news/tmobile-revl-smartpicks">https://www.t-mobile.com/news/tmobile-revl-smartpicks</a></p>	<p>[REDACTED]</p>
9/5/2017	<p>[Un-carrier Next] Netflix On Us benefit added as a free benefit for T-Mobile ONE customers. Netflix Standard 2-screen subscription included as a plan benefit.</p>	<p><a href="https://www.t-mobile.com/news/tmobile-uncarrier-netflix">https://www.t-mobile.com/news/tmobile-uncarrier-netflix</a></p>	<p>[REDACTED]</p>
11/12/2017	<p>Mobile Without Borders benefit modified so that customers only get 5GB of LTE in Canada/Mexico</p>		<p>[REDACTED]</p>

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Date	Description	Link	Strategy/Rationale
2018			
1/9/2018	Launch new Narrowband IoT plan for IoT devices (\$6 per year up to 12 MB per connected device).	<a href="https://www.t-mobile.com/news/narrowband-iot">https://www.t-mobile.com/news/narrowband-iot</a>	
3/15/2018	Unlimited 55+ pricing increases to \$70 for 2 lines		
4/18/2018	Launch T-Mobile ONE Military plan (discounted pricing for active duty military and veterans)	<a href="https://www.t-mobile.com/news/t-mobile-one-military">https://www.t-mobile.com/news/t-mobile-one-military</a>	
7/17/2018	Expand Simple Global benefit to provide unlimited data & texting in 210 countries and destinations. Increase Simple Global calling rates from \$0.20 to \$0.25. Launch new international day pass for high speed data.	<a href="https://www.t-mobile.com/news/t-mobile-one-blankets-the-globe">https://www.t-mobile.com/news/t-mobile-one-blankets-the-globe</a>	
8/6/2018	Launch T-Mobile Essentials plan (unlimited data for lower cost with fewer features)	<a href="https://www.t-mobile.com/news/introducing-t-mobile-essentials">https://www.t-mobile.com/news/introducing-t-mobile-essentials</a>	

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8/15/2018	<p>[Un-carrier Next] Launch new “Team of Experts” customer service model for postpaid customers. T-Mobile customers get “rock star status” at Live Nation concert events, including access to last-minute reserve seats and discounted tickets.</p>	<p><a href="https://www.t-mobile.com/news/un-carrier-15-press-kit">https://www.t-mobile.com/news/un-carrier-15-press-kit</a></p>	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>