

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

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| In the Matter of |) | |
| |) | |
| FCC Seeks Comment on Waiver of Part 25 |) | IB Docket No. 17-16 |
| Licensing Requirement For Receive-Only Earth |) | |
| Stations Operating with the Galileo |) | |
| Radionavigation-Satellite Service |) | |

REPLY COMMENTS OF T-MOBILE USA, INC.

T-Mobile USA, Inc. (“T-Mobile”)^{1/} hereby submits these reply comments in the above referenced proceeding in which the Commission seeks input on whether to allow devices operated in the United States to receive signals from the European-based Galileo satellite system.^{2/} T-Mobile agrees with the majority of parties submitting comments and supports the Commission’s proposal, which will enhance the effectiveness of a range of location-based applications and critically, emergency 911 (“E911”) services.

I. INTRODUCTION

T-Mobile, including the MetroPCS brand, offers nationwide wireless voice, text, and data services to over 71 million subscribers.^{3/} In the third quarter of 2016, T-Mobile added 2 million net customers – marking the 14th consecutive quarter in which the company has generated more than one million net customer additions.^{4/} T-Mobile also saw continued growth – for the past 14

^{1/} T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

^{2/} *FCC Seeks Comment on Waiver of Part 25 Licensing Requirement for Receive-Only Earth Stations Operating with the Galileo Radionavigation-Satellite Service*, Public Notice, FCC 17-18 (Rel. January 6, 2017) (“*Galileo Public Notice*”).

^{3/} See T-Mobile News Release, *T-Mobile Delivers Strong Customer Growth – ONCE AGAIN*, (Jan. 6, 2017), <https://newsroom.t-mobile.com/news-and-blogs/q416-prelim-results.htm> (“T-Mobile January News Release”).

^{4/} See *id.*

quarters in a row – in both branded prepaid and postpaid phone customers.^{5/} Within the space of three years, the footprint for T-Mobile’s 4G Long Term Evolution (“LTE”) network – the Nation’s the fastest growing 4G LTE network – has gone from covering zero to covering approximately 314 million Americans and ranking first or second for LTE speed in every region of the country.^{6/} T-Mobile has deployed Wideband LTE to 231 million people, and is expanding Extended Range LTE to enhance coverage and in-building performance.^{7/} In fact, T-Mobile already launched seven LTE Advanced technologies – more than anyone else in the industry.^{8/} All of the above investments benefit T-Mobile consumers, allowing them to stream three times more music, watch two times more video, and use 50% more data than any other carrier’s customers.^{9/}

For T-Mobile, like most carriers, the Global Positioning System (“GPS”) is a core component of providing accurate location information as part of its E911 service obligations^{10/} and is used by many other applications that its subscribers employ. Galileo is a global navigation satellite system (“GNSS”) like GPS and was designed by the European Space Agency

^{5/} See *id.*

^{6/} See T-Mobile News Release, *Time for a Real Micdrop. More Evidence T-Mobile is Destroying Verizon’s Network Edge* (Feb. 16, 2017) <https://newsroom.t-mobile.com/news-and-blogs/opensignal-2017-part-2.htm>, <https://newsroom.t-mobile.com/news-and-blogs/lte-advanced.htm> (“T-Mobile February News Release”) (also noting that T-Mobile’s coverage includes “99% of the people Verizon covers.”); see also T-Mobile January News Release.

^{7/} See T-Mobile January News Release (“[E]nhancements included further deploying Wideband LTE to 231 million people[.] . . . T-Mobile is also continuing to build out Extended Range LTE, which operates on the Company’s low-band 700 MHz A-Block spectrum, to enhance coverage and in-building performance.”); T-Mobile News Release, *T-Mobile Extended Range LTE Now Covers 240 Million People – and it’s Coming to Chicago* (Dec. 1, 2016), <https://newsroom.t-mobile.com/news-and-blogs/chicago-spectrum.htm>.

^{8/} See T-Mobile February News Release.

^{9/} See T-Mobile News Release, *Hello Un-carrier 12 ... R.I.P. Data Plans T-Mobile Goes All In on Unlimited* (Aug. 18, 2016), <https://newsroom.t-mobile.com/news-and-blogs/rip-data-plans.htm>.

^{10/} *In Re Wireless E911 Location Accuracy Requirements*, Third Further Notice of Proposed Rulemaking, 29 FCC Rcd. 2374 ¶¶ 2413-14 (2014) (“E911 Order”).

(“ESA”), in concert with the United States, to work alongside GPS.^{11/} Because Galileo is a foreign satellite system, the FCC has interpreted its rules to mean that any U.S.-based device requires a license.^{12/} The *Galileo Public Notice* asks, at the suggestion of the National Telecommunications and Information Administration (“NTIA”), whether the FCC should waive this requirement for Galileo.^{13/} T-Mobile urges the Commission to grant a waiver if one is required. Reception of Galileo signals presents an opportunity to improve crucial public safety operations in the U.S. while also providing better location-based services to wireless customers. However, instead of granting a waiver, T-Mobile suggests that the Commission determine that the rules that otherwise require licensing of earth stations receiving signals from foreign satellites do not apply to mobile wireless user devices. In doing so, though, the Commission should make clear that reception of signals outside the GNSS bands are only protected insofar as GPS, which operates within those bands, is protected.

II. INCORPORATING GALILEO SIGNALS WILL IMPROVE E911 OPERATIONS

In 2014, the Commission released updated wireless E911 location accuracy requirements.^{14/} Even then, the *E911 Order* found that the “great majority” of 911 calls were placed from wireless devices, and emphasized the importance of improving location data provided to first-responders when such calls are made.^{15/} At the time, the Commission placed great faith in the increased use of GNSS to assist in E911 services, specifically mentioning not

^{11/} See, *Agreement on the Promotion, Provision, and Use of Galileo and GPS Satellite –Based Navigation Systems*, signed by the United States of America and the member nations of the European Union, signed June 26, 2004, available at <http://www.gps.gov/policy/cooperation/europe/2004/gps-galileo-agreement.pdf>.

^{12/} See 47 CFR §§ 25.131(j)(1), 25.137.

^{13/} *Galileo Public Notice* at 1.

^{14/} *E911 Order*.

^{15/} *Id.* at ¶ 23-37.

just GPS but also Galileo in its decision.^{16/} Other commenters in the *E911 Order* proceeding and elsewhere also pointed out that Galileo has the ability to work alongside GPS to fulfil mobile device location-determination functions.^{17/}

T-Mobile takes its E911 responsibilities very seriously. That is why it was deeply involved in the *E911 Order* proceeding, including the roadmap developed by industry and public safety groups,^{18/} and has worked diligently with the Commission and internally to improve its E911 services. Therefore, it agrees with the vast majority of other parties in this proceeding that have urged the Commission to enhance E911 capabilities by taking appropriate action to allow U.S. mobile wireless user devices to receive and utilize Galileo signals.^{19/}

The public safety benefits of allowing the reception of Galileo’s signals are clear. NENA: The 9-1-1 Association, noted in its comments that “ensuring the availability of [GNSS]-derived position fixes is vital to the continued success of wireless Enhanced 9-1-1 and the future Next Generation 9-1-1 ecosystem.”^{20/} It was one of many commenters who explained how the use of multiple GNSS can improve the quality of a mobile device’s location determination: the more satellites “in view” from a particular location (meaning the device has a relatively unobstructed line-of-sight to the satellite) the higher the probability that the device will be able to obtain a fix particularly in challenging environments such as indoors or in densely forested

^{16/} *Id.* at ¶ 4, note 3.

^{17/} See, e.g., *Ex Parte* of Garmin International, Inc., IB Docket No. 11-109, Oct. 23, 2015 at 8; Comments of Qualcomm Incorporated, PS Docket No. 07-114, Dec. 15, 2014, at 4; *Ex Parte* of NextNav, LLC, PS Docket No. 07-114, May 12, 2014, at 10.

^{18/} *Indoor Wireless E9-1-1 Location Accuracy: The Roadmap Parallel Path, and the Final Rules*, NENA, The 9-1-1 Association.

^{19/} See e.g., Comments of Qualcomm, IB Docket No. 17-16, at 1 (filed Feb. 21, 2017) (“Qualcomm Comments”); Comments of AIRBUS Defense and Space, Inc., IB Docket No. 17-16, at 1-2 (filed Feb. 21, 2017) (“Airbus Comments”).

^{20/} Comments of NENA: The 9-1-1 Association, IB Docket No. 17-16 at 1 (filed Feb. 21, 2017) (“NENA Comments”).

areas.^{21/} NENA also noted the benefits in improving accuracy even when GPS-alone would provide some approximation of the device’s location, because the more satellites in view, the better.^{22/} Any improvement of the likelihood of a fix, or of the quality of an existing fix, could save lives; as EGNSS noted, “quick reaction into the right location can be the difference between life and death.”^{23/}

Other commenters pointed to other public safety benefits that would occur from reception of Galileo signals. EGNSS and AIRBUS also noted that, with two distinct GNSS systems, devices can detect “spoofed” or manipulated signals, which improves the reliability and resiliency of geolocation services depended on by emergency services.^{24/} Similarly, in the unlikely event of a disruption of GPS services, Galileo (and other GNSS) can fill in the gap when emergency services are needed.^{25/}

Notably, even those parties that expressed concerns about the waiver request did not dispute the public safety benefits that granting the request would provide.^{26/}

III. DEVICES RECEIVING GALILEO SIGNALS WILL PROVIDE OTHER BENEFITS TO CONSUMERS

Allowing U.S. devices to receive Galileo signals will also bring benefits to consumers outside the E911 arena. Location services have become a core part of many of the most popular

^{21/} *Id.*

^{22/} *NENA Comments* at 1; *see also* Comments of Broadcom Corporation, IB Docket No. 17-16 at 4 (Filed Feb. 21, 2017) (noting that “In the case of 911 services, [“the ability to get a fix under challenging conditions”] can have life or death consequences.”).

^{23/} Comments of European GNSS Agency, IB Docket No. 17-16 at 5 (filed Feb. 21, 2017) (“EGNSS Comments”).

^{24/} *Airbus Comments* at 1 (filed Feb. 21, 2017); EGNSS Comments at 1.

^{25/} Comments of Topcon Positioning Systems, Inc., IB Docket No. 17-16 at 2 (filed Feb. 21, 2017).

^{26/} *See*, Comments of Inmarsat Inc., IB Docket No. 17-16 (filed Feb. 21, 2017) (“Inmarsat Comments”); and Comments of Ligado Networks, LLC, IB Docket No. 17-16, at 16-18 (filed Feb. 21, 2017) (“Ligado Comments”).

uses for smartphones; gaming,^{27/} ad-delivery,^{28/} and feature-unlocking^{29/} applications also use the device's location in their operations. The more accurately wireless devices can determine their location, the better these customer experiences will be. And, as more and more location-based features and services are introduced, the demand for precise location accuracy will increase. With future development of autonomous vehicle technologies and the Internet of Things, the need for devices to know exactly where they are at any given time will increase.

T-Mobile therefore agrees with those commenting parties which recognize that the addition of Galileo to the available sources for location determination will help make location information available in circumstances where it is not available today and will allow devices to achieve the required accuracy in a wider variety of circumstances and a higher percentage of time for many applications. For example, commenters noted that modern agricultural equipment depends heavily on location-tracking technology, and the addition of Galileo will assist in those applications.^{30/} Others pointed out that GNSS is also used to synchronize across long distances and ensure clocks are as accurate as possible, a function which will be dramatically improved by the addition of Galileo's signals.^{31/} Commenters also pointed out the same benefits to navigation technologies, the accuracy of which will become especially crucial with the advent of autonomous systems.^{32/}

^{27/} See, e.g., *Pokémon Go Creator is Now the Most Popular Game Publisher in the World*, Fortune Magazine, Aug. 12, 2016.

^{28/} See, e.g., *Is Location Based Advertising the Future of Mobile Marketing and Mobile Advertising?*, Forbes Magazine, Jan. 17, 2013.

^{29/} See, e.g., myLINGO, an app which allows viewers to listen to 'dubbed' audio for a movie still in theaters in another language, but only works if the device's location is inside a movie theater. More information at <http://www.mylingoapp.com/faq.html>.

^{30/} Comments of Hexagon Positioning Intelligence, IB Docket No. 17-16 at 4 (filed Feb. 21, 2017) ("Hexagon Comments"); Comments of CNH Industrial, IB Docket No. 17-16 at 1 (filed Feb. 21, 2017).

^{31/} See, e.g., *EGNSS Comments* at 2; *Qualcomm Comments* at 1.

^{32/} See, e.g., *Hexagon Comments* at 4; *EGNSS Comments* at 1.

IV. THE PART 25 RULES SHOULD NOT APPLY TO MOBILE WIRELESS USER DEVICES

While the comments in this proceeding overwhelming support grant of the proposed waiver, they also demonstrate that the process itself is unnecessarily complex and burdensome.^{33/} This now-twenty year old rule was never intended to cover personal mobile wireless devices. As Trimble Inc. and Deere & Company note, according to the ESA, around 25% of devices currently available in the US already have the ability to receive Galileo's signals.^{34/} This is because manufacturers do not build different devices for the US and Europe: instead, they design them to work in both markets and use software to distinguish them, if they distinguish them at all.^{35/} Because the requested waiver seeks only to authorize the reception of signals by devices already commercially available, it is difficult to justify the process the Commission has undertaken.^{36/} As commenters noted, involving both the Commission and the NTIA in a multi-step, multi-year process is unnecessary and shows the need for reform of the rules.^{37/}

T-Mobile agrees that the process of permitting U.S. devices to receive non-U.S. GNSS signals should be reformed. Instead of a waiver of Section 25.131(j) of the rules, the better approach is for the Commission to find that the rule does not cover mobile wireless user devices.

^{33/} See, e.g., Comments of Trimble Inc. and Deere & Company, IB Docket No. 17-16 at 16-18 (filed Feb. 21, 2017) ("Trimble & Deere Comments"); Comments of Broadcom, IB Docket No. 17-16, at 2 (filed Feb. 21, 2017); and Comments of Hexagon Positioning Intelligence, IB Docket No. 17-16, at 2 (filed Feb. 21, 2017).

^{34/} See GPS World Staff, GSA: 40 Percent of GNSS Receivers Are Galileo-Ready, GPS World (May 9, 2016), <http://gpsworld.com/40-of-gnss-receivers-are-galileo-ready/>; see also FAQs, EUR. GNSS SERV. CTR., <https://www.gsc-europa.eu/helpdesk/faqs> (last viewed Mar. 07, 2017).

^{35/} *Trimble & Deere Comments* at 17. *NENA Comments* at 1 ("Today, virtually every US consumer carries a 'receive-only earth station' for [GNSS] signals in her or his pocket: a smartphone. Most of these smartphones are built for a global marketplace, one in which support for multiple RNSS systems is increasingly a competitive and regulatory requirement.").

^{36/} The original waiver request which prompted this proceeding was filed in October 2013. See Letter from Paul Weissenberg, Deputy Director-General, European Commission, to Jonathan Margolis, Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs, U.S. Dep't of State (Oct. 23, 2013).

^{37/} *Trimble & Deere Comments* at 17.

Doing so would be consistent with the Commission’s intent when it adopted the rules and with the regulation of mobile wireless user devices generally.

When Section 25.131 was adopted, it was clear that the Commission intended to require licensing of traditional, fixed devices. It observed that “[r]eceive-only earth stations are used predominantly to receive direct-to-home video services, such as DTH and DBS service.”^{38/} Similarly, it found that the “vast majority” of receive only earth stations are used to “receive direct to home video (or in the future, audio) services.”^{39/} While personal mobile wireless devices are capable of receiving satellite signals, they are not the devices the Commission contemplated when it adopted rules requiring licensing.

Moreover, as commenters pointed out in the proceeding adopting the current rules, a scheme requiring licensing of receive-only mobile terminals would create a different regulatory regime for services that use satellite signals than for those that use terrestrial signals.^{40/} In the latter case, there is no licensing of user equipment required. At the time the Commission considered this argument, there were generally no mobile devices that received both terrestrial and satellite signals. Now that the same device can receive both, the argument against licensing them is even more compelling. It makes little sense for the Commission to require licensing of personal mobile wireless devices under Part 25 when the same devices are not required to be licensed under the rules governing the terrestrial services under which they operate.

^{38/} *In the Matter of Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, 12 FCC Rcd. 24094 ¶ 197 (1997).

^{39/} *Id.* at ¶ 203. The Commission adopted a licensing requirement after recognizing that there were several alternatives to assess whether it should permit U.S. access for foreign satellites. If necessary, the Commission should re-examine whether other alternatives would more effectively address this concern, rather than imposing an obligation on personal mobile wireless devices that is inconsistent with the other services with which they operate.

^{40/} *Id.* at ¶ 200.

V. PROTECTION OF GALILEO SHOULD MIRROR PROTECTION OF GPS

In the *Galileo Public Notice*, the Commission observed that Galileo’s “E1” signal may extend below 1559 MHz, which is the lower-range of one of the bands currently allocated to GPS.^{41/} It sought comment on whether this could cause interference with operations in the L Band (1525-1559 MHz), which is allocated to the Mobile Satellite Service on a primary basis. In response, Ligado Networks, LLC and Inmarsat Inc. argue that there indeed are risks of interference from Galileo transmissions to their operations in the L Band.^{42/}

While T-Mobile has not attempted to verify the concerns of Ligado and Inmarsat, it urges that any permission for U.S. devices to receive signals outside the 1559-1610 MHz GNSS band not create further restrictions on operations in adjacent bands. The Commission has considered potential interference to GPS operations and, as a result, imposed out of band limitations in operations conducted in adjacent bands.^{43/} While the importance of GNSS operations justifies the limits the Commission has imposed, it must not protect operations outside the GNSS band at the potential expense of other services. Doing so would create an unproductive precedent under which supplemental GNSS bands could preempt use of other services. Accordingly, use of

^{41/} *Galileo PN* at 6. Note that there is some dispute on whether the E1 signal does indeed extend below 1559 MHz; in its filings with NTIA and the FCC, the European Commission indicated it is fully within the 1559-1610 MHz Band, but previous filings with The International Telecommunications Union and others indicated otherwise. *See id.* at 4. In its comments in this proceeding, the European Commission stands by its filings with the FCC. Comments of the European Commission, IB Docket No. 17-16 at 2 (filed Feb. 21, 2017).

^{42/} *Comments of Ligado* and *Comments of Inmarsat* at 5.

^{43/} *See, e.g., In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, 29 FCC Rcd. 4610 ¶¶ 66-69 (2014); *In the Matter of Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, 27 FCC Rcd. 16102 ¶¶ 118-122 (2012); *In the Matter of Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, 18 FCC Rcd. 1962 ¶¶ 180-184 (2003); and *In the matter of Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, 17 FCC Rcd. 7435 ¶¶ 34, 72-121 (2002).

additional spectrum outside the bands allocated to GNSS should only be protected insofar as GPS is protected *in those bands*.

VI. CONCLUSION

As the Commission has recognized, it is crucial that wireless devices know their location at all times, primarily because 911 services operate best if the first-responders tasked with providing assistance know the precise location of the caller. Consumers also expect their devices to be able to take full advantage of location-based services and applications which are now available. As commenting parties in this proceeding have demonstrated, grant of the waiver contemplated in the *Galileo Public Notice* would improve location-determination by wireless devices by supplementing the GPS system. T-Mobile therefore agrees that the Commission should allow U.S. devices to receive Galileo signals. It also agrees with commenting parties that the current process for permitting devices to receive non-U.S. GNSS signals is unnecessarily complex and lengthy. The better approach to providing the requested relief for mobile wireless user devices is for the Commission to declare that they are not covered by Section 25.131(j) at all. Finally, while receipt of signals using spectrum outside the primary GNSS spectrum of 1559-1610 MHz should be permitted, those operations should be afforded no more protection than operations in the GPS spectrum.

Respectfully submitted,

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