



# PUBLIC NOTICE

Federal Communications Commission  
445 12<sup>th</sup> St., S.W.  
Washington, D.C. 20554

News Media Information 202 / 418-0500  
Internet: <http://www.fcc.gov>  
TTY: 1-888-835-5322

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## WIRELESS TELECOMMUNICATIONS BUREAU AND OFFICE OF ENGINEERING AND TECHNOLOGY ESTABLISH PROCEDURE FOR REGISTERING ENVIRONMENTAL SENSING CAPABILITY SENSORS

GN Docket No. 15-319

### ESC Sensor Registrations will be accepted immediately for review

The Wireless Telecommunications Bureau (WTB) and the Office of Engineering and Technology (OET) (collectively, WTB/OET) of the Federal Communications Commission (Commission or FCC), as directed by the *3.5 GHz First Report & Order*.<sup>1</sup> This *Public Notice* summarizes the requirements for registering ESC sensors (ESC Sensor Registration) and describes the registration and review process.

**Background.** In the *3.5 GHz First Report & Order*, the Commission delegated authority to WTB/OET to oversee the ESC certification process and to facilitate the testing and development of multiple ESCs.<sup>2</sup> Consistent with the Commission's instructions, WTB/OET, in conjunction with the Department of Defense (DoD) and the National Telecommunications and Information Administration (NTIA), have worked collaboratively with industry stakeholders—including prospective SAS Administrators and ESC operators—to facilitate the certification and deployment of SASs and ESCs.<sup>3</sup> In order to coordinate access among the three tiers of users properly, SASs must use at least one of two protection methodologies—one of which is based on Exclusion Zones<sup>4</sup> and the other of which is based on

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<sup>1</sup> See *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 4067, para. 372 (2015) (*3.5 GHz First Report & Order*); 47 CFR §§ 96.1 *et seq.* In the *3.5 GHz First Report & Order*, the Commission established the Citizens Broadband Radio Service, which will share the band with federal and non-federal Incumbent Access tier users, as part of a broader three-tiered sharing framework enabled by one or more Spectrum Access Systems (SASs). See *3.5 GHz First Report & Order*, 30 FCC Rcd 3959. SASs will serve as advanced, highly automated frequency coordination systems that will assign spectrum within the band and coordinate access between and among the three tiers of users. See 47 CFR §§ 96.3 (Spectrum Access System), 96.53-96.66.

<sup>2</sup> See *3.5 GHz First Report & Order*, 30 FCC Rcd at 4067, paras. 369-373; see also 47 CFR §§ 0.241(j), 0.331(f). ESCs will consist of a network of sensors—infrastructure-based, device-based, or a combination of both—that will detect federal radars operating in and around the 3.5 GHz band and relay information regarding those transmissions to the SAS in order to protect incumbent federal operations. See 47 CFR §§ 96.3, 96.15, 96.67.

<sup>3</sup> See *3.5 GHz First Report & Order*, 30 FCC Rcd at 4067, para. 369; see 47 CFR §§ 0.241(j), 0.331(f).

<sup>4</sup> Exclusion Zones are “geographic area[s] wherein no CBSD shall operate.” See 47 CFR § 96.3 (Exclusion Zone).

Dynamic Protection Areas (DPAs). DPAs are pre-defined protection areas that extend beyond the coastline or that enclose a protected terrestrial radar facility, which may be activated or deactivated as necessary to protect DoD radar systems.<sup>5</sup> NTIA depicts these DPAs in Attachment A of the 2018 NTIA Letter, and the specific coordinates for the DPAs are available at <https://www.ntia.doc.gov/fcc-filing/2015/ntia-letter-fcc-commercial-operations-3550-3650-mhz-band>.

As required in the *3.5 GHz First Report & Order* and as established in the *SAS/ESC Proposal Public Notice*, all ESC operators must complete a two-stage review process before final certification and approval by the Commission.<sup>6</sup> The first wave of ESC operators completed the first stage of the review process on February 21, 2018, when WTB/OET conditionally approved their ESC operator proposals.<sup>7</sup> As part of the second stage of the review process, ESC operators must deploy approved sensors that cover DPAs and secure approval of their coverage plan before deploying as a certified ESC.<sup>8</sup>

**Review Process.** In order to complete the registration of ESC sensors, the registrant must include the information requested by this *Public Notice*. ESC Sensor Registrations may be submitted at any time on or after October 16, 2018. ESC operators need not submit all of their ESC Sensor Registrations simultaneously; WTB/OET will accept and, in close coordination with NTIA and DoD, will review information submitted by applicants, such as coverage maps described below, on a rolling basis. Any subsequent changes to the sensor deployments or coverage maps will need to be submitted and approved. ESC operators must comply with all instructions from WTB/OET and must provide any requested information in a timely manner. Once approved, WTB/OET will post approved ESC Sensor Registrations in GN Docket No. 15-319 on a rolling basis.<sup>9</sup>

**Requirements.** Registrants of ESC sensors must describe, in detail, the DPAs that will be made available and protected by the ESC's sensor network. All proposals must, at a minimum, demonstrate

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<sup>5</sup> *Promoting Investment in the 3550-3700 MHz Band*, Order, DA 18-538 (WTB/OET May 22, 2018), 2018 WL 2387489 (*DPA Waiver Order*). On May 22, 2018, after NTIA submitted a letter describing this protection methodology and recommending that, prior to certification of an ESC, the Commission allow SASs the option to use DPA-based protections instead of Exclusion Zones, WTB/OET, on its own motion, granted a conditional waiver of certain rules governing the protection of federal operations in the 3.5 GHz band for DPA-enabled SASs. *Id.*; see also Letter from Paige R. Atkins, Assoc. Admin., Office of Spectrum Mgt., NTIA, to Julius P. Knapp, Chief, OET, FCC, and Donald Stockdale, Chief, WTB, FCC, GN Docket No. 17-258 (May 17, 2018) (2018 NTIA Letter). SASs are required to protect DPAs (or alternatively, Exclusion Zones) regardless of the certification status of the ESC in question.

<sup>6</sup> See *3.5 GHz First Report & Order*, 30 FCC Rcd at 4070, para. 386; see also *Wireless Telecommunications Bureau and Office of Engineering and Technology Establish Procedure and Deadline for Filing Spectrum Access System (SAS) Administrators(s) and Environmental Sensing Capability (ESC) Operator(s) Applications*, Public Notice, 30 FCC Rcd 14170 (WTB/OET 2015) (*SAS/ESC Proposal Public Notice*).

<sup>7</sup> *Wireless Telecommunications Bureau and Office of Engineering and Technology Conditionally Approve Four Environmental Sensing Capability Operators for the 3.5 GHz Band*, Public Notice, 33 FCC Rcd 1942 (WTB/OET 2018). Additionally, WTB/OET are currently reviewing a second round of ESC operator proposals. See *Wireless Telecommunications Bureau and Office of Engineering and Technology Establish "Second Wave" Deadline for Proposals from Prospective Spectrum Access System (SAS) Administrators(s) and Environmental Sensing Capability (ESC) Operator(s)*, Public Notice, 32 FCC Rcd 2973 (WTB/OET 2017).

<sup>8</sup> See *3.5 GHz First Report & Order*, 30 FCC Rcd at 4067, para. 372 (noting that the second phase of the review process, during which final compliance testing takes place, can include a public testing period, testing of protections for incumbent systems, and field trials).

<sup>9</sup> Upon request and consistent with Section 0.459 of the Commission's rules, the Commission may treat information presented by an ESC operator in its ESC Sensor Registration as confidential and, upon approval, may post appropriately redacted ESC Sensor Registrations in GN Docket No. 15-319. See 47 CFR § 0.459.

that the coverage provided by the network of ESC sensors will comply with NTIA's published guidance<sup>10</sup> by providing the Radio Frequency (RF) site configuration details for each ESC sensor in the proposed deployment for the DPA and a coverage map of the sensor network as described below.

RF site configuration details for each ESC sensor in a proposed deployment for a DPA must provide the following information:<sup>11</sup>

- site location by latitude and longitude in a table format;
- ground elevation of the site location in feet;
- the radiation center height in feet above ground level (AGL);
- azimuth in degrees relative to True North;
- the horizontal/vertical beamwidth in degrees;
- the down tilt angle of the antenna in degrees;
- the antenna gain in dBi;
- make and model of the antenna and its pattern;
- the DPAs made available and protected by each sensor;<sup>12</sup> and
- any additional ESC design specific information necessary to demonstrate adequate coverage of each DPA.

The coverage map must show all sensor site locations, generated consistent with the guidelines as set forth in the requirements published by NTIA.<sup>13</sup> For ease of review, we recommend that this map should show the corresponding DPA geographic areas covered and the borders of the DPAs within any of the area covered by the relevant ESC sensors. DPAs in the coverage map must be based on NTIA's current KML files.<sup>14</sup> We also note that pathloss must be modeled using the Irregular Terrain Model published by NTIA<sup>15</sup> and must include sensor antenna gain and orientation in the analysis.<sup>16</sup>

**Procedural Requirements.** ESC operators must send ESC Sensor Registrations and any supplements to ESC.Sensor.Info@fcc.gov. ESC operators may request confidential treatment of information contained in their ESC Sensor Registrations consistent with Section 0.459 of the Commission's rules.<sup>17</sup> Questions regarding this *Public Notice* may be directed to Paul Powell, Assistant Division Chief, Mobility Division, Wireless Telecommunications Bureau at (202) 418-1613 or paul.powell@fcc.gov, or Navid Golshahi, Electronics Engineer, Policy and Rules Division, Office of Engineering and Technology, at (202) 418-2422 or navid.golshahi@fcc.gov.

By the Chief, Wireless Telecommunications Bureau, and the Chief, Office of Engineering and Technology.

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<sup>10</sup> NTIA notes that its "DPA protection criteria may be changed if required to protect future radars." 2018 NTIA Letter at 4.

<sup>11</sup> See *id.*

<sup>12</sup> If multiple sensors' outputs are used for complete coverage of a DPA, the registrant must provide a description of how such information is combined for full DPA coverage and protection.

<sup>13</sup> See 2018 NTIA Letter.

<sup>14</sup> The KML files are available at: <https://www.ntia.doc.gov/fcc-filing/2015/ntia-letter-fcc-commercial-operations-3550-3650-mhz-band>.

<sup>15</sup> Available at: <https://www.its.bldrdoc.gov/resources/radio-propagation-software/itm/itm.aspx>.

<sup>16</sup> See 2018 NTIA Letter at 4.

<sup>17</sup> See 47 CFR § 0.459.