Ms. Marlene Dortch  
Secretary  
Federal Communications Commission  
445 12th Street, S.W.  
Washington, D.C. 20554  


April 12, 2020

Dear Ms. Dortch:

This letter responds to the April 10, 2020 submission by the NTIA concerning the above-captioned applications. It is simply astounding the repeated times that certain federal agencies have attempted to usurp the statutory authority vested by Congress with the Commission to regulate the standards for and commercial use of commercial radio spectrum. The most recent letter from the Acting Director of the NTIA and the letters enclosed therewith\(^1\) (collectively, the “NTIA Submission”) are just the latest examples of other agencies seeking to arrogate to themselves authority that the law has vested in the Commission. Raising no new evidence, no new arguments, and no new claims, the NTIA Submission is based entirely on unsupported and overblown claims of threats to the military use of GPS, irrelevant statutory references, and assertions that somehow the NTIA-led interagency review deprives the Commission of its rightful role as the ultimate and exclusive decision-maker on commercial spectrum issues. In short, its claims are unavailing.

\(^1\) See Letter from Douglas W. Kinkoph, Deputy Assistant Secretary (Acting), National Telecommunications and Information Administration, to Ajit Pai, Chairman, FCC (Apr. 10, 2020) enclosing Letter from David L. Norquist, Deputy Secretary, Department of Defense, to Hon. Wilbur L. Ross, Jr., Secretary, Department of Commerce (Mar. 24, 2020); Letter from Dana Deasy, Chief Information Officer, Department of Defense, and Michael Griffin, Under Secretary of Defense for Research and Engineering, Department of Defense, to Douglas W. Kinkoph, Deputy Assistant Secretary (Acting), National Telecommunications and Information Administration (Mar. 12, 2020); and Memorandum from Thu Luu, Executive Agent for GPS, Department of the Air Force, to IRAC Chairman (Feb. 14, 2020) (the “Air Force Memorandum”).
The NTIA Submission contains no evidence that the Commission, which is guided by the Administrative Procedures Act (“APA”) and—unlike the unsupported DoD position—subject to rigorous review by an appellate court, can rely upon given its existing allocation decision and its existing rules on interference. For years now, Ligado has met every reasonable request to grant protection to GPS with a resounding and emphatic “yes.” This most recent Submission requests that Ligado relinquish to GPS all of the spectrum assigned to it by the Commission and licensed for commercial terrestrial use and yet offers no evidence to show how that is necessary. The NTIA Submission is especially galling in light of the urgent need to make mid-band spectrum available to meet our 5G needs. Our Nation’s security and our economy demand that we end this four-year long debate once and for all. The Commission’s leadership on 5G and its efforts to make mid-band spectrum available must be supported if we are to advance the public interest and win the global race to 5G.

Though it is replete with fearmongering, the NTIA Submission is devoid of any new evidence that the Commission instructed all stakeholders to submit nearly four years ago, is based on irrelevant and misleading data, and offers no new or compelling reasons the Commission should not move swiftly forward in approving Ligado’s Modification Applications. Ligado addresses below the many flawed assertions in the NTIA Submission.

I. The NTIA Submission Relies on Irrelevant and Misleading Data to Support its Claims.

The DoD claims that approval of Ligado’s Applications would somehow threaten GPS. Astonishingly, this claim is based on irrelevant and misleading data and is not supported by any concrete evidence in the record that the Commission (guided by the APA) could rely upon. The claim fails for multiple reasons.

First and foremost, the Air Force Memorandum ignores what is perhaps the most critical and basic fact in the entire proceeding: the actual power level for the band closest to GPS that Ligado proposed nearly two years ago. The Air Force Memorandum claims that Ligado’s own data shows high-precision devices will be negatively impacted. But that data is the result of testing that was based on a presumed operating level of 32 dBW in the 1526-1536 MHz band, which was the power level Ligado requested in 2016 and abandoned nearly two years ago. Ligado amended its License Modification Applications in 2018 to request a new maximum power limit of 9.8 dBW (10W) in that band—a revised power level that amounts to a more than 99.3% reduction. Analysis of the same test results for high-precision GPS devices at the now-proposed 9.8 dBW (10W) shows that almost all of the devices affected at the old power level of 32 dBW are not affected at the current power level of 9.8 dBW (10W).

As evident in the chart below, Ligado’s proposal to reduce the power level to 9.8 dBW (10W) drastically reduces the impact of its proposed operations on high precision devices.
The significance of the two devices that still indicate an impact has already been addressed. Importantly, all of the major GPS manufacturers have reached co-existence agreements with Ligado—including Trimble and NovAtel, the manufacturers of those two devices—and, as a result, do not object to Ligado’s proposed operations. In fact, NovAtel—a leading high-precision

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device manufacturer and DoD supplier—has publicly expressed its support for the Commission approving the License Modification Applications.³

Relatively, the Air Force Memorandum’s suggestion that Ligado’s offer to repair and replace any device not protected by the lower power level or about which the GPS manufacturers are wrong amounts to a “tacit admission” by Ligado that its proposed operations would create interference for high-precision devices is a gross distortion of the record. Ligado has offered to repair and replace U.S. government devices “as necessary,”¹⁴ and that good-faith offer is based on its analysis of the thousands of hours of testing in the record, which, as reflected above, shows that few, if any, devices will need to be repaired or replaced at these dramatically reduced power levels. However, Ligado makes this offer and will be held to it in an abundance of caution to ensure no USG devices are adversely affected.

As Ligado has repeatedly documented, the extensive testing and the co-existence agreements in the record establish that the operations of GPS devices will not be compromised— i.e., they will not experience harmful interference from Ligado. This evidence undermines claims in the Air Force Memorandum, which are themselves unsupported by any references to new evidence or specific testing in the record. For example, although the Memorandum claims that Ligado’s proposals would not protect airborne uses of GPS,⁵ the 9.8 dBW (10 W) power limit Ligado requested is the exact power level the FAA concluded was safe for certified aviation GPS receivers at the end of a year-long consultation between Ligado and the Federal Aviation Administration—a conclusion that was included in the DoT’s GPS Adjacent Band Compatibility Assessment Final Report (“ABC Study”) released in April 2018⁶. And although the Air Force

³ See NovAtel-Ligado Joint Filing, supra note 2.

⁴ Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene Dortch, Secretary, FCC, IB Docket No. 11-109 (filed May 31, 2018).

⁵ See Air Force Memorandum, supra note 1, at 2.

Memorandum claims that Ligado’s proposal would leave “many high-value federal uses of civil GPS receivers not owned by the government . . . vulnerable to interference,” the fact that Ligado reached coexistence agreements with the major GPS manufacturers shows that this claim is simply wrong.

Second, the other “data” in the record that the Air Force Memorandum relies upon is also irrelevant. The ABC Study and the National Space-based Positioning, Navigation and Timing Systems Engineering Forum are both based on the erroneous assumption that the 1 dB C/N0 metric is applicable to services in bands adjacent to GPS. As Ligado has previously explained, the 1 dB metric is (a) not part of the FCC’s rules for adjacent band operations, (b) entirely inapplicable to the pending License Modification Applications, and (c) not a standard.

- The Commission’s rules define “harmful interference” as “interference which endangers the functioning of a radionavigation service or other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with [the ITU] Radio Regulations.” 7 1 dB C/N0 is not—not—a measure of harmful interference. Even the DoT had to acknowledge this basic fact when it explained at a public forum that 1 dB C/N0 is not a measurement of harmful interference but instead is an “interference protection criteria.”

- Given the Commission’s rules, it is especially significant that nowhere in the NTIA Submission, including all of the DoD letters, is there any assertion that Ligado’s proposal would cause harmful interference; this assertion is not made even once. That is a telling omission under the APA in light of the clarity of the Commission’s rules defining harmful interference. Without a new rulemaking proceeding (which neither the DoD nor the FCC has ever initiated), it would be arbitrary and capricious for the Commission to apply a standard different than what is in its rules to evaluate Ligado’s License Modification Applications.

- Neither the Commission nor the ITU has ever applied 1 dB C/N0 degradation to protect a service from transmissions in an adjacent band, which is the situation the License Modification Applications raise. 8

- 1 dB C/N0 is not “a standard” because it has never been defined as such and, consequently, there is no meaningful way of consistently measuring and applying this metric. In addition, as data from the NASCTN study shows, 1 dB is measured and reported inconsistently and inconsistently and inconsistently.

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7 47 C.F.R § 2.1(c).
8 See Reply Comments of Ligado Networks LLC, IB Dkt. No. 11-109, at 3 (July 19, 2018) (“July 2018 Reply Comments”). See also id. at Appendix A for additional information on the Commission’s use of the 1 dB standard. To be clear, Ligado has long agreed that a 1 dB change is the appropriate standard for co-channel (in-band) emissions (i.e., emissions into the GNSS band). See, e.g., id. at 15. Ligado’s proposal clearly meets the standard in that band, the band that has been allocated to GNSS.
mostly incorrectly.\textsuperscript{9} It would be arbitrary and capricious for the Commission to base any
decision on such a flawed and undefined metric.

There is thus no basis in the Commission’s rules or in the record for concluding that GPS
devices are entitled to a 1 dB C/N\textsubscript{0} level of protection from transmissions in an adjacent band.
Equally important, there is no basis in the record to conclude that such an unfounded and
unprecedented level of protection is needed for these GPS devices to provide the service they were
intended to provide. The ample evidence from thousands of hours of testing support that point.\textsuperscript{10}

Third, the claim put forth in the 2020 Air Force Memorandum is directly contrary to a
formal position agreed to by the Air Force nearly a decade ago. In 2010, the Air Force entered
into a Memorandum of Understanding with the NTIA pursuant to which DoD agreed not to seek
the exact type of protection it is effectively now requesting. As documented in the Commission’s
record, this Memorandum contains the Air Force’s clear statement on what spectrum protections
are needed. Specifically, GPS BLKIII Satellite Payload Spectrum Certification JF 12/09603,
OMB Circular A-11 of July 12, 1999, and OMB Circular A-11 of August 18, 2011 state:

The certification of the GPS-III satellite in May 2010 made it clear that NTIA and
the Air Force had agreed that \textit{GPS receivers were not entitled to protection for a
bandwidth of greater than 24 MHz (extending from 1563-1587 MHz), outside the
spectrum on which LightSquared intends to operate}).\textsuperscript{11}

Thus, since May of 2010, the key players within the DoD indicated that to protect military use of
GPS, DoD needed only the 24 megahertz of spectrum allocated to it and within the GNSS band.
Yet the NTIA Submission, and particularly the Air Force Memorandum, simply ignores this
evidence in the record. The Air Force Memorandum’s implication that the DoD now effectively
needs over 100 megahertz, from 1526 MHz to 1656 MHz, to accomplish that same goal is entirely

\textsuperscript{9} See WILLIAM F. YOUNG, ET AL., LTE IMPACTS ON GPS, NIST, at 271–75 (2017), available at

\textsuperscript{10} See id. Although the Air Force Memorandum also references (for the first time) testing the Air
Force conducted at White Sands Missile Range (WSMR) in April 2016, which was classified,
the Air Force Memorandum makes clear that these tests “supported the conclusions drawn from
the DoT testing at WSMR conducted during the same month.” Air Force Memorandum at 1.
Accordingly, as with the DoT testing that relied on the 1 dB C/N\textsubscript{0} metric, there is no reason to
find that the WSMR testing provides evidence that is in fact relevant to the License Modification
Applications.

\textsuperscript{11} See July 2018 Reply Comments, supra note 9, at 18 (citing GPS BLKIII Satellite Payload
Certification JF 12/09603, OMB Circular A-11 of July 12, 1999, and OMB Circular A-11 of
August 18, 2011).
inconsistent with this existing agreement and cannot be accepted in the absence of some explanation.

The Commission is bound under the APA to engage in reasonable decision-making and cannot act in an arbitrary and capricious manner. It strains credulity for the Commission to accept on faith an implicit premise of the Air Force’s position that GPS devices are worse today than they were before. Consider the facts. All of the major GPS manufacturers have reached co-existence agreements with Ligado, and as a result they do not oppose FCC approval. The GPS marketplace has evolved substantially since 2011, and even from 2015, when the GPS manufacturers entered those co-existence agreements. Even the mere suggestion that the potential or future of GPS is more vulnerable than the present capacity of GPS is implausible. It also carries disconcerting policy implications, in light of the widely known threats of jamming and spoofing and the recent Executive Order, which directs agencies to use more resilient GPS devices and to engage in more responsible use of GPS.

Finally, contrary to the Commission’s clear direction to all stakeholders, the Air Force Memorandum does not present any concrete information to support the conclusion that Ligado’s proposed operations threaten military use of GPS. The Commission made explicitly clear when it issued the public notice on Ligado’s License Modification Applications in 2016 that it sought “specific comment on . . . any unresolved concerns” and asked for “information on the basis of these concerns” including “specific relevant information about affected GPS receivers.” Since 2012, the DoD has had an opportunity to present in the record any issues it saw as pertinent to addressing the risks to GPS, but it has failed to do so and the most recent submission does nothing to remedy that failure. In fact, one of the studies cited in the Air Force Memorandum, the 2016 study by the Air Force, was not included in any form in the Air Force Memorandum. Consequently, the FCC cannot rely on that study as part of its reasoned decision-making. The NTIA Submission has thus led to the Commission waiting patiently even as we fall behind in 5G

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12 See supra note 2.
16 See Memorandum from Thu Luu, Executive Agent for GPS, Department of the Air Force, to IRAC Chairman (Feb. 14, 2020). This testing presumably relies, as the DOT Study does, on the 1 dB metric. Thus, to the extent that 1 dB is not the correct metric of harmful interference, these test results are irrelevant to the FCC’s assessment of Ligado’s Applications.
for over four years to receive effectively no additional information of relevance or value and delaying the availability of critical spectrum that can help meet the Nation’s 5G needs.

II. DoD’s Citation of 10 U.S.C. § 2281 Is Irrelevant Since It Is Not Implicated, and It Does Not Alter the Commission’s Authority to Make Decisions Regulating Commercial Use of Spectrum.

The NTIA Submission cites 10 U.S.C. § 2281 no fewer than six times, but all that repetition cannot change the fact that the statute is of limited legal significance. As letters in the NTIA Submission cite (though they misquote the statute), “the Secretary of Defense ‘may not agree to any restriction on the GPS [sic] proposed by the head of a department or agency of the United States outside DoD that would adversely affect the military potential of GPS.’”17 Nothing in this language empowers the DoD to make an end run around the Commission’s statutory authority to regulate commercial use of spectrum. All it does is obligate the Secretary of Defense to disagree with the actions of another agency under certain circumstances.

First, that statutory language in no way curtails the authority of the FCC, to which Congress assigned the exclusive authority to determine how spectrum should be allocated and used.18 This authority is neither superseded nor diminished by 10 U.S.C. § 2281. The DoD’s compliance with its statutory directive to disagree has no impact on the Commission’s statutory obligation as the expert agency to execute its responsibility under the Communications Act of 1934, 47 USC §151 et seq., and to make spectrum decisions based on facts and analysis in the record, as required by the APA.

17 See Letter from David L. Norquist and Air Force Memorandum, supra note 1. The full text of 10 U.S.C. § 2281(b)(5) provides: “The Secretary of Defense shall provide for the sustainment and operation of the GPS Standard Positioning Service for peaceful civil, commercial, and scientific uses on a continuous worldwide basis free of direct user fees. In doing so, the Secretary . . . may not agree to any restriction on the Global Positioning System proposed by the head of a department or agency of the United States outside the Department of Defense in the exercise of that official's regulatory authority that would adversely affect the military potential of the Global Positioning System.”

18 See 47 U.S.C. §303. See also Head v. New Mexico Bd. of Examiners in Optometry, 374 U.S. 424, 430 n.6 (1963) (affirming that the jurisdiction of the FCC over technical matters associated with the transmission of radio signals “is clearly exclusive”); New York SMSA Ltd. P’ship v. Town of Clarkstown, 612 F.3d 97, 100 (2d Cir. 2010) (Congress “intended the FCC to possess exclusive authority over technical matters related to radio broadcasting”); Broyde v. Gotham Tower, Inc., 13 F.3d 994, 997 (6th Cir. 1994) (discussing “the FCC’s exercise of exclusive jurisdiction over the regulation of radio frequency interference”).
To further underscore the central and exclusive role of the Commission in making spectrum decisions, Congress explicitly affirmed the FCC’s exclusive authority over this specific question. On December 23, 2016, Section 1698 of the FY2017 NDAA became law, and it plainly asserts that the Commission has jurisdiction over spectrum management decisions related to GPS. In the process, FY17 NDAA repealed previous language inserted in the FY12 NDAA. The FY17 NDAA followed a lengthy examination of the Ligado proposal by the Armed Services Committees, and it recognizes the Commission’s authority and expertise in making spectrum decisions relating to appropriate GPS frequency protections. In short, that law affirms the clear statement in the Communications Act: the Commission is exclusively charged with resolving issues regarding GPS and spectrum allocation. 10 U.S.C. § 2281 does not bear on the Commission’s authority or decision, and the Commission should resolve this issue consistent with Section 1698 of the FY17 NDAA, the Communications Act, and the APA.19

Second, DoD’s citation to Section 2281 is irrelevant because that statute refers to “restrictions on GPS,” but the decision pending before the FCC would not impose any restriction on GPS. The decision pending before the FCC would not alter the allocation of spectrum to GPS. It would not affect the level of protection that GPS devices enjoy when they are operating in their allocated spectrum. In short, it would not change at all the operation of GPS devices that are using the spectrum allocated to them. Instead, the decision pending before the Commission relates solely to Ligado’s use of its own spectrum, which the Commission licensed to Ligado over two decades ago. The plain truth, which the NTIA Submission repeatedly ignores, is that Ligado’s License Modification Applications do not address the band allocated for GPS use, a band that lies separate and apart from the bands licensed to Ligado. Indeed, if the Commission approves the Applications, nothing will change with respect to the spectrum bands allocated to GPS, since the Applications do not entail even a modification of the spectrum allocation to GPS.

DoD’s claims are particularly remarkable in light of the fact that Ligado has imposed restrictions on its own operations to accommodate and address GPS concerns by relinquishing ten megahertz of spectrum to create a guard band for GPS and by dramatically reducing its power in the “Lower Downlink” by more than 99.9% from the level authorized in 2010 and more than 99.3% from the maximum reflected in the License Modification Applications. If the

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19 The DOD’s attempt to overstate the support for views expressed in the Air Force Memorandum should also be noted. Although the Air Force Memorandum has signatories from agencies other than the DoD, key agencies such as the Departments of Agriculture, State, Treasury, and Veterans Affairs are conspicuously missing. Furthermore, the fact that certain agencies are represented as signatories should not be interpreted as evidence of those agencies’ opposition to Ligado’s proposed operations. Most notably, even though the Letter includes a Department of Justice signatory, Attorney General Barr has personally and publicly expressed his support for using the L-Band to advance 5G. See Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene Dortch, Secretary, FCC, IB Docket No. 11-109 (filed Feb. 6, 2020).
Commission approves Ligado’s License Modification Applications, a 23-megahertz guard band, or “buffer zone,” will separate Ligado and GNSS. That is a tremendous amount of valuable terrestrial spectrum that will lie fallow for one reason only: to protect, not restrict, the potential of GPS.

In addition, by seeking to have the Commission deny Ligado’s applications, DoD is effectively seeking to restrict completely (as in deny) Ligado’s use of the spectrum licensed to it since DoD’s claims demand as a practical matter that more than 100 megahertz (from 1526 MHz to 1656 MHz) be allocated for GPS. This position amounts to an attempt to short-circuit the APA and the rulemaking processes governing the allocation of spectrum for commercial use such as Ligado’s and for use by GPS. As a matter of administrative law and spectrum policy, DoD’s position thus appears to be nothing more than an attempt to grab spectrum not currently allocated to it. Thus, there is no way in which Ligado’s proposal to use its own spectrum and relinquish additional spectrum to protect GPS can be seen as a “restriction” on GPS.

III. **NTIA’s Assertion of a Central Role in the Commission’s Exclusive Statutory Authority to Render a Decision on Ligado’s Applications Is Deeply Flawed.**

Lastly, the Commission should assess the NTIA Submission appending these DoD materials, with only the weight it deserves. The NTIA Submission’s assertion that the Commission cannot “reasonably reach” a conclusion that harmful interference concerns regarding Ligado’s proposed operations have been resolved, greatly overstates NTIA’s role in this proceeding and seeks to arrogate to NTIA a role that Congress gave exclusively to the Commission.

The NTIA skips over the plain fact that the Communications Act of 1934 grants the Commission exclusive authority to regulate non-Federal uses of spectrum, and the Commission’s jurisdiction over technical matters associated with radio frequency interference is absolute. Despite the unambiguous nature of this exclusive authority, the NTIA Letter

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20 See 47 U.S.C. § 151 (creating the FCC for the purpose of regulating interstate and foreign commerce by wire and radio); id. § 301 (stating the Act’s purpose of maintaining Federal Government control of the radio spectrum and requiring that no person transmit radio signals except pursuant to a license granted under the Act); id. § 302 (empowering the Commission to regulate the interference potential of radio transmitters); id. § 303 (empowering the Commission to adopt such regulations as it deems necessary to prevent interference between radio stations and to encourage more effective use of radio spectrum in the public interest).

21 See Head v. New Mexico Bd. of Examiners in Optometry, 374 U.S. 424, 430 n.6 (1963) (noting that the FCC’s jurisdiction over “technical matters such as frequency allocation” is “clearly exclusive”); see also New York SMSA Ltd. P’ship v. Town of Clarkstown, 612 F.3d 97, 100 (2d Cir. 2010) (stating that Congress “intended the FCC to possess exclusive authority over technical
suggests that the 2011 Conditional Waiver Order affords NTIA an effective veto over the Commission exercising such authority. The NTIA Letter notes that the 2011 Conditional Waiver Order provides that the process for authorizing Ligado’s commercial operations will be complete “once the Commission, after consultation with NTIA, concludes that the harmful interference concerns have been resolved.”

Yet, a straightforward reading of this language makes plain that the Order merely provides that the Commission will consult with the NTIA. As the Tenth Circuit stated in a regulatory case involving an agency consulting with another agency, “advice is only that; it can, and sometimes should, be prudently ignored” *G.H. Daniels III & Assocs. v. Perez*, 626 F. App’x 205, 210-11 (10th Cir. 2015) (statutory “consultation” obligation merely requires agency to “seek advice from” another agency, but it “sometimes should be prudently ignored.”). After nearly 1,500 days of opportunity for consultation and numerous discussions with NTIA, the Commission has discharged any duty it may have had under the Order to consult with the NTIA, and the NTIA is entitled to no further role in the Commission’s process.

No reasonable interpretation of the 2011 Order supports the conclusion that it somehow amended the Communications Act to split the FCC’s spectrum authority with another agency. Indeed, such an interpretation granting NTIA veto power would amount to an impermissible subdelegation by the Commission of its own exclusive authority. *G.H. Daniels*, 626 F. App’x at 211. At most, only the Commission—not the NTIA—is entitled to deference when interpreting the scope of a Commission Order. The NTIA simply cannot claim any authority to interpret the Commission’s own Order. Regardless of the assertions in the NTIA Letter, the Commission remains free to exercise its exclusive statutory authority and to reach its own conclusions over the appropriate disposition of Ligado’s License Modification applications.

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For the reasons described above, Ligado respectfully submits that the concerns raised in the NTIA Submission lack merit and only serve to further delay a proceeding that has already run

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23 *See* Letter from Gerard J. Waldron, Counsel to Ligado Networks LLC, to Marlene Dortch, Secretary, FCC, IB Docket No. 11-109 (filed May 3, 2019).

unreasonably long. Accordingly, the Commission should move swiftly to approve the License Modification Applications.

Please direct any questions to the undersigned.

Sincerely,

/s/ Gerard J. Waldron
Gerard J. Waldron
Counsel to Ligado Networks LLC

cc: Chairman Pai
Commissioner O’Rielly
Commissioner Rosenworcel
Commissioner Carr
Commissioner Starks