BEFORE THE
DEPARTMENT OF COMMERCE
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
WASHINGTON, D.C.

In the Matter of	)	
	)	
Privacy, Transparency, and Accountability Regarding Commercial and Private Use of Unmanned Aircraft Systems	)	Docket No. 150224183-5183-01
	)	FR Doc. 2015-05020
	)	
Request for Public Comment	)	
	)	

COMMENTS OF THE
NEW JERSEY INSTITUTE OF TECHNOLOGY
UNMANNED AIRCRAFT SYSTEMS WORKING GROUP

Communications with respect to this document should be sent to:

Michael J. Chumer, Ph.D. — chumer@njit.edu
Director, Unmanned Aircraft Systems Research, New Jersey Innovation Institute (NJII)
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Submitted by:
Lucas A. Armeña — lucasarmena@gmail.com
Emergency Management and Business Continuity Program
NEW JERSEY INSTITUTE OF TECHNOLOGY
(917) 414-6969

DATE: April 20, 2015

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COMMENTS OF THE
NEW JERSEY INSTITUTE OF TECHNOLOGY
UNMANNED AIRCRAFT SYSTEMS WORKING GROUP

The Unmanned Aircraft Systems (UAS) Applied Research Working Group of New Jersey Institute of Technology (NJIT)[1] (hereinafter, "NJIT Working Group") hereby comments as a collaborative of subject matter experts and students to the above-referenced Request for Public Comment (RFC). See 80 Fed. Reg. 11978-80 (March 5, 2015).

While the RFC was initiated as provided to the Department of Commerce, National Telecommunications and Information Administration (NTIA) by The Executive Office,

[1] One of the nation's leading public polytechnic universities, New Jersey Institute of Technology (NJIT) is a top-tier research university that prepares students to become leaders in the technology-dependent economy of the 21st century. NJIT's multidisciplinary curriculum and computing-intensive approach to education provide technological proficiency, business acumen and leadership skills. With an enrollment of more than 10,000 undergraduate and graduate students, NJIT offers small-campus intimacy with the resources of a major public research university. NJIT is a global leader in such fields as solar research, nanotechnology, resilient design, tissue engineering, and cyber-security, in addition to others.

Presidential Memorandum on Domestic UAS dated February 15, 2015,[2] we highlight that the period for written comment for this RFC was shorter than the period provided in the Department of Transportation, Federal Aviation Administration (FAA) Notice of Proposed Rulemaking (NPRM) for small unmanned aircraft systems (sUAS).[3] It is noted that the NTIA is a non-regulatory agency.

The implications of the proposed rule by a regulatory agency (FAA) are, at times, intermingled with NTIA domestic UAS integration. Insofar that impact of UAS innovation presumed far-reaching — beyond the scope of FAA or NTIA —major policy changes for a wide spectrum of domestic and international stakeholders and individuals are forecasted. It is important to the NJIT Working Group and its partners that we understand all of the potential overarching and domain-specific impacts of proposed policy and governance of this technology may have upon the public at-large. The FAA proposed rule embodies 48 pages in the Federal Register and its verbiage considered to be binding upon adoption as a Final Rule. As such, the NJIT Working Group shall submit timely its separately addressed Comment to the FAA NPRM via the Federal eRulemaking Portal for Docket ID: FAA-2015-0150 while also submitting this Comment to the NTIA RFC. Areas highlighted for at-large or agency-specific attention are

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[2] Office of the Press Secretary, "**Presidential Memorandum: Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems**," February 15, 2015. The White House. Retrieved from https://www.whitehouse.gov/the-press-office/2015/02/15/presidential-memorandum-promoting-economic-competitiveness-while-safegua
The *Memo* was issued to the heads of Federal executive departments and agencies.

[3] The FAA NPRM comment period opened February 23, 2015 and scheduled to close April 24, 2015 (60 days);
The NTIA RFC comment period opened March 5, 2015 and scheduled to close April 20, 2015 (46 days).
See "**Operation and Certification of Small Unmanned Aircraft Systems**," 80 Fed. Reg. 9543-90 (February 23, 2015). ("FAA NPRM") pp. 9544, 83. The FAA NPRM is filed to the docket folder in the Federal eRulemaking Portal as no. FAA-2015-0150-0017.
Also see "**Privacy, Transparency, and Accountability Regarding Commercial and Private Use of Unmanned Aircraft Systems**," 80 Fed. Reg. 11978-80 (March 5, 2015). ("NTIA RFC") pp. 11979-80. The NTIA RFC is filed as Docket No. 150224183-5183-01, Federal Register portal Document Number 2015-05020.

elaborated by the group in the FAA NPRM Comment, and it is urged that NTIA review the detailed NPRM Comment, when retrievable from the Federal eRulemaking Portal docket folder, as applicable to this RFC.

Due to the significance of this new industry, many UAS-interested parties may be unable to provide well-informed comments because the processes to establish governance and policy adhere to static and non-innovative administration. In organizational studies especially those that relate to organizational behavior there is something called the principle of requisite variety. The principle relates to how an organization views its environment and how organization structures and underlying processes adapt to its environment. Environments that appear static are best addressed by corresponding static organization structures. Bureaucratic structures such as those of the Department of Commerce and NTIA can be viewed as static and non-innovative in attempting to address issues in rapidly changing and chaotic environments. However those same bureaucratic structures can be viewed as effective but only when the environment itself is static. The UAS environment is rapidly changing by being embedded with disruptive technology and disruptive innovation. This is the current picture of the environment facing federal regulatory agencies such as the FAA and other agencies such as the Department of Commerce and the NTIA. This chaotic environment requires organizational structures that are rapidly adaptive, are flat in their structure, and moves decision making and decision making processes to the edge of the organization not up and down and bureaucratic chain. Notwithstanding, the open period for the RFC (and NPRM) did not allow sufficient time for further study and collection of relevant information.

Whereas, the NJIT Working Group offers its best-informed comments, but reserves the right to amend or supplement this submission if the comment period for the RFC is extended past its current date of April 20, 2015.

INTRODUCTION

As a collaborative of researchers and proponents, housed within a public institution of higher education and public research university in the State of New Jersey, the NJIT Working Group's objectives are to advance the integration of unmanned aircraft systems into our national airspace system through multidisciplinary applied research of emergency management, homeland security and defense, and public safety domains. Its work, to demonstrate the power of UAS innovation to enhance the capabilities of decision-makers of emergencies and disasters, has been performed over the last eight (8) years primarily in conjunction with members of the university; NJII[4]; The Business Emergency Operations Center (BEOC) Alliance[5]; and New Jersey City University's (NJCU) Doctor of Science program in Civil Security Leadership, Management and Policy.

In the years preceding 2015, NJIT Working Group research and testing — inclusive of modeling and simulation, as well as policy analyses — occurred in laboratories and restricted airspace. In January 2015, the group became the first in New Jersey to conduct non-recreational UAS flights in the national airspace system (NAS) through the FAA's Certificate of

[4] New Jersey Innovation Institute (NJII) is a New Jersey Institute of Technology (NJIT) non-profit organization.
[5] The BEOC Alliance is a non-profit collaborative of subject matter experts which support operations of NJIT.

Waiver or Authorization (COA) program,[6] and remains the only public entity authorized to do so in our Nation's most densely populated state. The NJIT Working Group is uniquely positioned in complex airspace — with laboratory and restricted airspace testing continuing tangentially with its NAS tests — insofar as the data collected from its research may aid the FAA in actualizing safe airspace integration through assessment of operational capabilities and innovative uses of unmanned aircraft as an onboard and ground-based system of technologies.

The NJIT Working Group Comment simply articulate suggestions, viewpoints, concerns, and/ or data and information requested for topics in the NTIA RFC. This is done to energize the larger conversation of UAS domestically and internationally. The NJIT Working Group shall not necessarily endorse pro- or counter-viewpoints, and, more importantly, the Comment may not represent the individual views of its contributors. As such, the comment may offer alternatives which conflict. Ultimately, the comment provokes constructive and productive shifts for agencies responsible for domestic UAS integration.

Additionally, the NJIT Working Group is a member of the Mid-Atlantic Aviation Partnership (MAAP), housed at the Virginia Polytechnic Institute and State University (Virginia Tech) which was designated in December 2013 as one of the six test sites in the U.S. authorized to develop procedures to ensure safe integration of this technology into the national airspace system in accordance with the FAA Modernization and Reform Act of 2012. It is noted that while this relationship exists, NJIT on its own was granted the aforementioned COA by the FAA in May 2014 in order to conduct its research objectives as stated above. As such, unless specified, NJIT Working Group operations are not that of a MAAP-related test range and not an

[6] As a public research university, NJIT met satisfying requirements and authorizations as a "Public Aircraft" conducting "Public Aircraft Operations" as provided in 49 U.S.C. §§ 40102(a)(41) and 40125.

execution of the test site's Other Transaction Agreement (OTA). The NJIT Working Group comment is for sole representation of its team, and not that of any Comment that may be submitted by MAAP or Virginia Tech.

Although components of the team comprise academic, aviation, technology, policy, emergency management, and homeland security proficiencies, for purposes of this RFC the NJIT Working Group comment focuses upon the questions posed by the NTIA on March 5, 2015.[7] Supplemental information is provided for topics raised in the RFC or related to the activity being governed. It is noted that the matter of unmanned aircraft expands well beyond the scope of privacy, transparency, and accountability best practices. All operations conducted by the NJIT Working Group may be affected by actions born of NTIA or other agencies empowered by the *Presidential Memorandum on UAS.* This is noted to draw attention to the RFC-specific pool of subject matter talent in *Information About the Commenter* section below.

INFORMATION ABOUT THE COMMENTER

The NJIT Working Group was formed for the purpose of educating stakeholders of the full intelligence potential which value oriented applied research and testing of UAS technologies may provide to achieve dominant situational understanding for strategic decision-making with regards to safely integrating the innovation into the national airspace, with a specific focus on the domains of emergency management, homeland security, homeland defense, public safety,

[7] "**Privacy, Transparency, and Accountability Regarding Commercial and Private Use of Unmanned Aircraft Systems**." 80 Fed. Reg. 11978-80 (March 5, 2015). The NTIA RFC is filed as Docket No. 150224183-5183-01, Federal Register portal Document Number 2015-05020.
The NTIA RFC primarily asks 16 open-ended questions soliciting comment regarding concerns of economic competitiveness, public safety, privacy, civil rights, and civil liberties.

maritime security, and critical infrastructure and stakeholder asset protection, continuity and monitoring.

The NJIT Working Group was formed and is administered by Michael J. Chumer, Ph.D. The interdisciplinary team is a core of approximately one dozen members affiliated through the four (4) entities in the *Introduction* above. Primary contributors to this Comment are presented through the following biographical sketches:

Michael J. Chumer, Ph.D.
Director, Unmanned Aircraft Systems Research, New Jersey Innovation Institute;
Research Professor (ret.) and Adjunct Professor, New Jersey Institute of Technology;
Academic Adviser and Affiliated Faculty, Doctor of Science Program in Civil Security Leadership, Management and Policy, New Jersey City University; and
Board of Directors, The Business Emergency Operations Center Alliance

Professional Preparation
Undergraduate Institution
Major – Marine Engineering
B.S. 1964 – United States Naval Academy
Graduate Institutions
Major – Information and Computer Science
M.S. 1970 – Georgia Institute of Technology
Major – Communication and Information Science
Ph.D. 2002 – School of Communication, Information and Library Studies, Rutgers University

Appointments

2012-present	Director, UAS Research, New Jersey Institute of Technology and New Jersey Innovation Institute
2012-present	Adjunct Professor, New Jersey Institute of Technology
2012-present	Affiliated Faculty, New Jersey City University
2008-present	Board of Directors, The Business Emergency Operations Center Alliance
2002-2012	Research Professor, Information Systems, Information Systems Department, New Jersey Institute of Technology
1998-2002	Head Media and Digital Services, Rutgers Dana Library (Newark, NJ campus) Head Technical Services, Rutgers Dana Library Technical Services Council, Rutgers University Libraries Adjunct Faculty, School of Communication, Information and Library Studies, Rutgers University

1994-1998	Adjunct Faculty, Rutgers University
1992-1994	Information Technology/Information Systems Consulting
1988-1992	Executive Director, International Office Technologies Association
1983-1988	Adjunct Faculty, Fairleigh Dickinson University Director, Center for Information Systems and Technology, Fairleigh Dickinson University
1974-1983	District Manager, Cost Account System Analysis and Design, AT&T Longlines
1964-1974	Major, United States Marine Corps Assistant Director, Marine Corps Automated Services Center Okinawa Japan (1970-1974) Data Processing Curriculum Developer, Overseas Campus, University of Southern California (Okinawa Campus) Liaison and Instructor for Chinese Marine Corps on large scale computer system analysis, design, development, and implementation. Combat Engineer Officer, Danang, Vietnam

Publications (partial)

Chumer, M. **"The Private Sector and Homeland Security"** in "Introduction to Homeland Security" Logan and Ramsay, 2012

Chumer, MJ, and Egan, R **"The Business Emergency Operations Center; A Model for Inter-Agency and Inter-Sector Communication and Collaboration"** Command and Control Research Program, 16th ICCRTS, June, 2011

Chumer, MJ, **"Survivability of the Internet"** Strategic Studies Institute Proceedings (US Army War College), June 2009

Chumer and Scher, **"Hybrid course development and assessment"** NJEDGE Conference on Best Faculty Practices" (March 2005)

Co-editor of the book **"Managing Knowledge: Critical investigations on work and learning**" , Macmillan(2000), Prichard, Hull, Chumer, and Willmott.

Chumer, M., Hull, R., and Prichard, C. (2000). **"Introduction: situating discussions about knowledge"**. In Prichard, C., Hull, R., Chumer, M. and Willmott, H (Eds.) Managing Knowledge, London: Macmillan.

Chumer, MJ **"The Self Ethnography as a "Critical" Research Approach"** to be published as a chapter in **"Critical Perspectives on Information Systems" Brooke, 2005 (Sage)**.

Kaghan and Chumer,**"Virtuality and the Generalized Other"** Conference paper accepted at the Critical Management Conference, University of Cambridge, UK (July 2005)

Turoff, Chumer, Hiltz, Alles, Kogan, Vasarhelyi **"Assuring Homeland Security: Continuous Monitoring, Control & Assurance of Emergency Preparedness",** prepublication for Special Edition on Emergency Management Information Systems in the Journal of Information Technology Theory and Application,(2005)

Turoff, Chumer, Van de Walle, Yao **"The Design of Emergency Response Management Information Systems (ERMIS)"**, Journal of Information Technology Theory and Application, May 2004 **(to be also reprinted by the IEEE as part of a volume containing the best engineering communication papers of 2004)**

Chumer, M. **"Countering the Moses effect: The role of critical scholarship in Knowledge Management"** (CMSW online(Nov. 1999))

Synergistic Activities

Unmanned Aircraft Systems (UAS) in Emergency Management and Homeland Security
Successfully developed and was awarded a FAA Certificate of Waiver and/or Authorization (COA) for New Jersey Institute of Technology to create processes and procedures required to bring UAS capabilities to emergency management, homeland security, organizational security and public safety.

First UAS flights in New Jersey under a COA
In January 2015 directed the first flights of non-recreational UAS in New Jersey under a COA in the NAS. Three (3) flights were performed using a tactical UAS (Arcturus T16xl reconfigured as a RS16) under VLOS. Approximately three (3) hours total flight time. Flights used two (2) ground observers under a VLOS envelope of 3,000 feet MSL and one (1) nautical mile lateral distance from the ground observers. Flights tested streaming video from the UAS tail-cam into multiple emergency operations centers in the States of New Jersey and New York. Real-time mapping payload also tested during each flight.

Lucas A. Armeña
Graduate Student, New Jersey Institute of Technology; and
Commission Member, Dispute Resolution Commission, State of North Carolina

Professional Preparation
Undergraduate Institution
Major – Sociology, Criminal Justice
B.A. 2002 – Wagner College
Graduate Institution
Major – Emergency Management and Business Continuity
M.S. 2015 (expected completion: December) – New Jersey Institute of Technology

Appointments

2014-present	Commission Member, Dispute Resolution Commission, State of North Carolina
2012-2013	Paralegal, Davis Law Group, P.A.
2009-2011	Donor Coordinator (Human Organ and Tissue), LifePoint, Inc.
2005-2008	Central Intake Paralegal and Settlement Coordinator, Motley Rice LLC
2002-2005	Law Firm Manager, Paralegal, Pressler & Pressler LLP
2001-2002	Intern for The Honorable Michael J. Brennan, J.S.C., New York State Unified Court System
1998-2001	Emergency Medical Technician, Hoboken Volunteer Ambulance Corps (N.J.)
1996-1999	Emergency Medical Technician, Ho-Ho-Kus Volunteer Ambulance Corps (N.J.)
1994-1997	File Clerk, Messineo & Messineo
1993-1996	Volunteer Explorer, Ridgewood Emergency Services (N.J.)
1993-1997	Volunteer Instructor Aide, American Red Cross (N.J.)

Synergistic Activities

Emerging policy issues and legislation of disruptive technologies, UAS focus
Applied research achieved through continued interface with past and present officials, members and staff of various Federal, State and local governmental bodies, agencies, and committees.

NJIT UAS Working Group Administration
Manages, coordinates and issues reports on group initiatives, with a focus on policy, as guided by the program director.

First UAS flights in New Jersey under a COA
In January 2015 served as the administrative operations officer to achieve the first flights of non-recreational UAS in New Jersey under a COA in the NAS.

Robert A. Bell, MS, MEP
Fellow, National Cyber Security Institute at Excelsior College;
Board of Directors, Special Projects, The BEOC Alliance; and
Emergency Management Consultant, Security Evaluation & Solutions Group, LLC

Professional Preparation
Undergraduate Institutions
Major – Aviation Technology
B.S. 1996 – Thomas Edison State College
Major – Mathematical Science
B.A. 1999 – Kean University
Graduate Institution
Major – Emergency Management and Business Continuity
M.S. 2012 – New Jersey Institute of Technology

Appointments
2014-present Fellow, National Cyber Security Institute at Excelsior College
2014-present Board of Directors, Special Projects, The BEOC Alliance
2010-present Emergency Management Consultant, Security Evaluation & Solutions Group, LLC

Publications
Bartholomew J. Tortella, Robert F. Lavery, Carl Corriere, Robert A. Bell, Keith J Mann: The Impact of Multiple Patient Transport on Patient Care in Helicopter Emergency Medical Services. *Air Medical Journal* 1996:15:3:108-10.

Emanuele Emanouilidis, Robert A Bell: Latin Squares and Their Inverses. *Mathematical Gazette* Vol. 88, No. 511, 2004.

Conlon, Kathe M. Bell, Robert A. Ruhern, Chris. Houng, Abraham: **Increasing the Reliability of Predicting Burn Bed Availability for Disaster Response.** *Journal of Burn Care & Research.* (Under review.)

Synergistic Activities
Conlon, Kathe M. Bell, Robert A. Ruhern, Chris. Houng, Abraham: **Increasing the Reliability of Predicting Burn Bed Availability for Disaster Response.** *Journal of Burn Care & Research Proceedings. March/April 2013*. Presented at the 45th Annual Meeting of the American Burn Association, April 2013.
Bell, Robert A, Chumer, Michael: **Civil Military Incident Command: Integrating ICS and C2 to Meet Current Emergency Response Demands.** 16th *ICCRTS Proceedings* (in press). Presented at the 16th International Command and Control Research and Technology Symposium, June 2011.

Bell, Robert A, Chumer, Michael: **Virtual Small Business Emergency Operations Center (VSBEOC): Shared Awareness and Decision Making for Small Business.** 16th *ICCRTS*

Proceedings (in press). Presented at the 16th International Command and Control Research and Technology Symposium, June 2011.

Bell, Robert A, Avery-Gomez, E: **Business Continuity for Small Business Owners: Do the Tools Fit Their Need?** ISCRAM 2011 *Proceedings* (in press). Presented at the 8th International Community on Information Systems for Crisis Response and Management Conference, May 2011.

Bell, Robert A: **Incident Command: Who's In Charge?** Presented at the 5th Annual Homeland Defense and Security Education Summit, March 2011.

Bell, Robert A, Spence, R, Chumer, Michael: **Building Resilience Into Business Continuity: The Human Element.** Presented at the 2nd Annual West Point Critical Infrastructure Symposium, January 2011.

Lynn P. Costantini, CISSP
Doctoral Student, New Jersey City University

Professional Preparation
Undergraduate Institution
Major – Economics
B.A. 1982 – Seton Hall University
Graduate Institutions
Major – Business Administration
M.B.A. 1989 – Rider University
Major – Civil Security Leadership, Management and Policy
D.Sc. 2016 (expected) – New Jersey City University

Master's Certificate, Project Management, Villanova University

Certified Information System Security Professional (CISSP)
Security Clearance (Secret level) sponsored by the U.S. Department of Energy (Inactive)

Appointments

2011-2013	Chief Information and Regulatory Officer, Utility Risk Management Corporation
2003-2011	Vice President and Chief Information Officer, North American Electric Reliability Corporation
	Director, Information Technology (1995-2003)
	Director, Generating Availability Data System (1989-1995)

Synergistic Activities

- Specialty – Cyber security
- Experience writing cyber security standards for electric utilities, which are now international standards enforced by the Federal Energy Regulatory Commission in the US.
- Represented the electricity industry in public-private initiatives to define and implement threat and vulnerability information sharing protocols.
- Testified before Congressional subcommittees regarding the electric utility industry's cyber security posture.
- Developed cross-sector cyber response training exercises
- Prepared policies, procedures and standards for physical and cyber security risk assessment and vulnerability mitigation, and developed supporting training and awareness programs.
- Participated in the development and testing of new technologies to improve the reliability of the bulk power grid in North America.

Jeffrey B. Reaves, M.S. EMBC, EVSC.
Adjunct Professor, New Jersey Institute of Technology
Board of Directors, Domestic Operations, The BEOC Alliance

Professional Preparation
Undergraduate Institution
Major – Computer Technology, Information Technology, Medical Informatics
B.S. – New Jersey Institute of Technology
Graduate Institutions
Major – Information Systems, Emergency Management and Business Continuity
M.S. – New Jersey Institute of Technology
Major – Environmental Science
M.S. – New Jersey Institute of Technology

Appointments
2014-present Adjunct Professor, New Jersey Institute of Technology
2014-present Board of Directors, Domestic Operations, The BEOC Alliance
1996-present New Jersey State Bar Association

Synergistic Activities
The BEOC Alliance Liaison to Newark Office of Emergency Management, Amtrak, and FEMA prior to and post Hurricane Sandy.

Instrumental in the recovery of businesses that endured losses throughout the state as a result of Sandy.

Selected for Hurricane Sandy Presidential Recipient Award.

Project Lead in Pilot Project that developed a model middleware infrastructure in support of (UICDS) Unified Incident Command and Decision that was demonstrated and utilized in real time by large corporations prior to and post natural disaster.

Technical Operations and assistant to Ground Observer activity in the Historic First Flight of a Civil Unmanned Aerial System (UAS) under the National Air Space in New Jersey at TRACEN, Cape May, New Jersey.

Michael Russell
Doctoral Student, New Jersey City University; and
Earth Science Teacher, Bridgewater-Raritan Regional School District (N.J.)

Professional Preparation
Undergraduate Institution
Major – Environmental Studies
B.A. 1993 – East Stroudsburg University
Graduate Institutions
Major – Teaching
M.A.T. 2002 – Monmouth University
Major – Military History
M.M.H. 2008 – Norwich University
Major – Civil Security Leadership, Management and Policy
D.Sc. 2016 (expected) – New Jersey City University

Certificate, Elementary School Teacher, New Jersey Standard Certificate

Appointments
1999-present Earth Science Teacher, Bridgewater-Raritan Regional School District (N.J.)

Publications
Master, T., Frankel, M., & Russell, M. (1993). *Benefits of Foraging in Mixed-Species Wader Aggregations in a Southern New Jersey Saltmarsh*. Colonial Waterbirds 16(2): 149-157.

Synergistic Activities
Researching as a New Jersey City University doctoral student under New Jersey Institute of Technology Federal Aviation Administration Certificate of Authorization, examining and analyzing the legislation and policy for integrating unmanned aerial systems (UAS) into the National Airspace System.

Researching fire chief perceptions of UAS use during fire department operations in the state of New Jersey.

Fire and Safety Service, Ltd (N.J.) 1990-present
Shareholder of family owned and operated business.
Involved in various phases of organization since 1990.
Familiar with:
Fire apparatus and equipment sales
Fire operations in theory and practice
Exposed to management and budgetary protocol
Inventory management

Metuchen Volunteer Fire Department (N.J.) 1993-2002

Certified New Jersey Firefighter I & II
Executive Board Secretary - Eagle Hook & Ladder Company
Advanced Pump Operator course
Apparatus driver and operator
Member New Jersey Exempts Firemen's Association

Allen R. Sondej, Esq.
Adjunct Professor and Doctoral Student, New Jersey City University;
President, New Jersey Public Safety Accreditation Coalition; and
Attorney at Law, of Counsel, Lee H. Engelman P.C.

Professional Preparation
Undergraduate Institutions
Major – Criminal Justice
A.S. – Mercer County Community College
Major – Security and Safety Admininstration
B.S. – New Jersey City University
Graduate Institutions
Major – Law
J.D. – Seton Hall University School of Law
Major – Civil Security; Leadership, Policy & Management
D.Sc. *(currently pursuing)* – New Jersey City University

Trenton Police Academy (N.J.), Certified Police Officer
Somerset County Police Academy (N.J.), State Certified Police Instructor
FBI Certified, Defensive Tactics Instructor
Monadonock Certified, PR-24 Instructor
MSI Certified, OC/Baton Instructor
University of Delaware Certified, Field Training Officer
The New Jersey State Association of Chiefs of Police, New Jersey Police Executive Institute, 9th Session
The New Jersey State Association of Chiefs of Police, New Jersey Police, West Point Command and Leadership School, 2011 Session *(Chief Harry Wilde Academic Achievement Award recipient)*
Graduate-FBI Law Enforcement Executive Development Seminar, June 2012
NJ SORA Instructor, March 2015

MEMBERSHIPS
Member-New Jersey Bar
Member-United States District Court for the District of New Jersey
Member-New Jersey Bar Association
Former Member-Board of Directors ARC of Somerset New Jersey
Vice President/Co-Founder-Law Enforcement Lawyers Association of New Jersey
Former Member South Brunswick Township Human Relations Commission
Member FBI Law Enforcement Executive Development Association

Appointments
2006-present Adjunct Professor, New Jersey City University
2013-present President, New Jersey Public Safety Accreditation Coalition
2007-present Attorney at Law, of Counsel, Lee H. Engelman P.C.
2007-2013 Vice President of Legal Affairs, New Jersey Pubic Safety Accreditation Coalition

1990-2013	South Brunswick Police Department, Monmouth Jct. (N.J.) Division Commander/Accreditation Manager, Support Services: Captain Watch Commander: Sergeant First Class Training Instructor Crime Prevention / Public Information Officer Patrol Officer
1994-present	Safety and Security Consultant
1993-1996	Director of Training, New Jersey Auxiliary Police Officers Association
1988-1990	Police Officer, Trenton Police Department (N.J.)
1990-1991	Non-Commissioned Officer, Military Police, United State Marine Corps (S.C.)
1985-1988	Security Manager, E.R. Squibb & Sons
1986-1994	Military Police, United States Marine Corps Reserve (P.A.)

David S. Zuckerman, D.M.D.
Graduate Student, New Jersey Institute of Technology
Career Dentist

Professional Preparation
Undergraduate Institution
B.S. 1984 – Fairleigh Dickinson University
Graduate Institutions
Major – Dental Medicine
D.D.M. 1988 – Fairleigh Dickinson University
Major – Emergency Management and Business Continuity
M.S. 2013-current – New Jersey Institute of Technology

Synergistic Activities

2000-Current	Volunteer Firefighter
2014-Current	NJIT UAS Research Team
2010-Current	Macy's Thanksgiving Parade Balloon Flight Management 2010-Current
2010-2014	Allamuchy Township Land Use Board (N.J.)

BACKGROUND

The National Telecommunications and Information Administration (NTIA) published a Request for Public Comment (RFC) in the Federal Register on March 5, 2015,[8] commencing establishment of a multi-stakeholder engagement process to develop and communicate best practices for privacy, accountability, and transparency issues regarding commercial and private UAS use in the National Airspace System (NAS) as directed by President Obama's Presidential Memorandum issued on February 15, 2015 titled "Promoting Economic Competitiveness While Safeguarding, Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems." NTIA is enabled as provided in Section 2.(b) of the *Presidential Memorandum*. The *Presidential Memorandum* cites authority "to establish transparent principles that *govern* the *Federal* Government's use of UAS in the NAS," and that to the extent practicable, "*promote* [responsible UAS operations] in the *private* and *commercial* sectors" (emphases added).[9] The text indicates its applicability to Federal entities, and acknowledges that other users (e.g. private, commercial) are outside of its scope. While it can be argued that high Federal standards could promote industry benchmarks, it can be conversely argued that unenforceable use will always remain available as an elective decision.

As a whole, empowered through the above listed professional credentials, the members of the NJIT UAS Applied Research Working Group offer the following responsive comments to the RFC. The above credentials furthermore demonstrate the unique composition of the

[8] "**Privacy, Transparency, and Accountability Regarding Commercial and Private Use of Unmanned Aircraft Systems**." 80 Fed. Reg. 11978-80 (March 5, 2015). The NTIA RFC is filed as Docket No. 150224183-5183-01, Federal Register portal Document Number 2015-05020.

[9] Office of the Press Secretary, "**Presidential Memorandum: Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems**," February 15, 2015. The White House. Retrieved from https://www.whitehouse.gov/the-press-office/2015/02/15/presidential-memorandum-promoting-economic-competitiveness-while-safegua

working group, as it relates to UAS, technology, communications, policy and legislative issues. The members offer valuable knowledge, experience, and insight as a collaborative of multidisciplinary academia and other related stakeholders. Specified in the appropriate sections below, individual members hereby offer to serve on the presidentially-directed NTIA multi-stakeholder panel and feel strongly that their contributions will be significant to this emerging new industry, and in turn, for our Country.

It is noted that the RFC (of NTIA, a *non-regulatory agency*) was initiated and concluded during a period of time encompassed within the period for comment provided in the FAA NPRM.[10]

- The NTIA RFC is three (3) pages and has a public comment period of 46 days ending on April 20, 2015.

The NPRM (of FAA, a *regulatory agency*) proposes to amend regulations to adopt specific rules to allow operations of sUAS in the NAS. The enabling authority cited for the FAA NPRM is generally aviation-specific.

- The FAA NPRM is 48 pages and has a public comment period of sixty (60) days ending on April 24, 2015.[11]

Many aircraft affected by the FAA NPRM will also be evaluated by NTIA for previously mentioned integration concerns. Interested parties monitoring the industry are aware that domestic commercial operations already exist 'under the radar' without Federal knowledge.

[10] "**Operation and Certification of Small Unmanned Aircraft Systems**." 80 Fed. Reg. 9543-90 (February 23, 2015). The FAA NPRM is filed to the docket folder in the Federal eRulemaking Portal as no. FAA-2015-0150-0017.
[11] *Ibid.*

Generally speaking, public safety is known as a municipal power and property laws may be guided by State and municipal powers.

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Noted Comment 1

The NJIT Working Group is mindful that the NTIA RFC and FAA NPRM are respectively a request and proposal only. Congress has indicated a 2015 reauthorization with potential to supersede provisions of the *FAA Modernization and Reform Act of 2012*. Absent a shift to a flexible technology-driven process, any rulemaking or policy changes should provide for acceptance of any dynamic and flexible processes adopted by regulatory agencies having jurisdiction. Supporting the notion of overall safety, the community-level might support measures which identify boundaries or other oversight commissioned. Ideally, we may consider sophisticated, multidisciplinary stakeholder-involved decision-making strategies tied to future flexibility. There are complexities tied to respective constituencies. It is time to rehumanize the process.

Leveraging the information-sharing cultural norms of the emergency management community — in practicable discipline with public and private enterprises — dynamic administrative flexibility is embraced in the text of the proposed public system modernization introduced on March 19, 2015 as H. R. 1472 before the 114th Congress:

> The system shall incorporate multiple technologies; "be <u>designed to adapt to, and incorporate, future technologies</u> for [public safety];" enhance "local and regional public and private partnerships to enhance community preparedness and response" by improving

abilities, mediums, and redundancy to "include a mechanism [ensuring] protection of individual privacy." (Emphasis added)[12]

This pending legislation suggests a course of action which shifts toward provisions for proactivity, in lieu of malaise. Oftentimes, proactive community participation echoes the culture and attitude seen in innovative communities and technology companies —primary developers of the maturing UAS industry.

Notwithstanding the above pending legislation, the UAS integration process (including FAA's proposed framework) does not provide for inclusion of future technologies. For illustrative contrast, during the open period for comment the Office of Naval Research (ONR) announced UAS demonstrations of its LOCUST (Low-Cost UAV Swarming Technology) program; a combat-oriented force multiplier of autonomous or swarming tactical UAs.[13] For the emergency management community, substituting the word "warfighter" with first responder or incident commander can be relatable. Simply, our military's future capabilities are not included in the domestic conversation. For example, following final rule implementation, a local search for a missing person in a desert cannot employ current Naval LOCUST capabilities of autonomous UAVs flying synchronized and in formation A logical and well-informed, final rule which considers contemplated or uncontemplated and actual benefits is preferred over an additional decade of initiating, enduring another lengthy sUAS rulemaking.

In the weeks following the inaugural flights of public UAS in N.J., the NJIT Working Group met with various departments and the NJIT Air Force ROTC program leadership. The FAA NPRM

[12] H.R. 1472 — 114th Congress (2015-2016), *Integrated Public Alert and Warning System Modernization Act of 2015*, introduced on March 19, 2015. *At* Sections 2.(a)(3)(A) through (F).
[13] *LOCUST: Autonomous, Swarming UAVs Fly into the Future* by David Smalley, Office of Naval Research Communications. Story No. NNS150414-10. Released April 14, 2015 11:20 AM.

was published several weeks following the first flights in the NAS by NJIT (a State of N.J. *COA holder*), and the NTIA RFC was published ten (10) days following the FAA action. For practical reasons, these tangential activities and resource-consuming processes seem to be burdensome to the creativity of disruptive technologies. The period for comments was prohibitive for all members of the NJIT community to have a healthy discussion about UAS regulation. Regardless, NJIT will convene meetings of appropriate students, researchers, and members of the private and public sectors in order to address the disruptive effects of UAS on social and organizational stakeholders.

Noted Comment 2

Although an entire page of *Background* precedes NTIA's 16 questions, any context as it may apply to all RFC questions, are unclear. At times the questions seem too open-ended in terms of the comments that will certainly be made; plausible and debatable. Debatably, any Comment provided in reply to this RFC is not comprehensive since it may not address or consider all variables or potential impacts.[14] It is noted and hereafter implied that all questions are considered overly broad and burdensome for the NJIT Working Group to provide well-informed or comprehensive Comment. Additionally, considering mindfulness in *Noted Comment 1* above, the responses provided for this RFC are as succinct and brief as possible. To the extent that an area may relate, the area is elaborated in the NJIT Working Group's FAA NRPM Comment and the official public submission shall be incorporated for consideration as it

[14] Some contextual examples which may impact or change comments responsive to the RFC, includes but is not limited to: public or private entity or collaborative activity, requirements, classifications, segmented groups and/or general population.

relates to this RFC. In either action, upon request the NJIT Working Group may supplement or amend material to promote well-informed comment, particularly those borne through university discussion.

COMMENT — FEDERAL REGISTER VOL. 80, NO. 43, P. 11980

General

1. **The Presidential Memorandum asks stakeholders to develop best practices concerning privacy, transparency, and accountability for a broad range of UAS platforms and commercial practices. How should the group's work be structured? Should working groups address portions of the task?**

The group's work could be structured around a governing body or commission appointing appropriate representatives for interested individuals or entities. Reasonably, best practices for certain professions may apply to this disruptive technology. The group shall account for all current and potential stakeholders, regardless of existing or future political or business decisions or attendance. At a minimum, all stakeholders or similarly interested entities should be identified. If governed as a commission, committees and subcommittees serve equivalent working group tasking. Portions of the task shall be defined by the group and should not be determined by anyone other than stakeholders of the group. Also see above, *Noted Comment 1* and *2*.

At this point we comment that our Nation should rapidly implement measures to allow growth of a brand new industry — mindful of economic competitiveness, in an era of phenomenal innovation — and should do so cautiously in our jurisdiction so as to avoid compromising safety. Beginning our Comment in this context, we illustrate that UAS innovation is much more than an air safety task of the FAA. In order to fully achieve this innovation's

potential; integration should be viewed more broadly and definitely including a public safety context.

As a matter of public safety, during a July 2012 hearing before the House Committee on Homeland Security, Subcommittee on Oversight, Investigations, and Management, a dialogue was initiated but was not continued in later hearings that the FAA may not be the correct lead agency for implementation of UAS domestically. [15] The difficulty is that FAA is reluctant to address issues it considers outside of its domain. However the issue of "domain" is squarely at the heart and epi center of UAS implementation in the NAS. If viewed solely through the lens of transportation then the FAA is the appropriate regulatory agency. If viewed through a parallel lens of Homeland Security then transportation is not the primary "domain" rather security, surveillance, and emergency response/recovery trump transportation. If viewed through the lens of certain private sector entities building use and business cases for communication relay and small package delivery then again transportation is not the primary domain. If viewed through the lens of the movie industry transportation is trumped by video and photo shoots. Lastly if viewed from the lens of the agriculture community then transportation is again trumped by the precision agriculture domain. Hence the conundrum as to where Federal, state, county, municipal and tribal or territorial oversight, and potential regulation, begins and ends. How do domains not within the "transportation" jurisdictional umbrella of the FAA add their voices to the growing chaotic environment that is so feebly being attempted to regulate and at

[15] House Committee on Homeland Security, Subcommittee on Oversight, Investigations, and Management hearing titled "Using Unmanned Aerial Systems Within The Homeland: Security Game-Changer?" July 19, 2012. U.S. Government Printing Office, Serial No. 112-107; and retrieved from http://homeland.house.gov/hearing/subcommittee-hearing-using-unmanned-aerial-systems-within-homeland-security-game-changer

the same time grow the US economy and do so safely, transparently, and with an eye to privacy?

Returning to the July 2012 Hearing, the point was further elaborated by Chief Deputy William R. McDaniel of the Montgomery County Sheriff's Office (T.X.) who testified that government entities tend to have "myopic vision;" that the "FAA does not have the experience in its application [of public safety uses];" and "they have no real understanding regarding the 'critical mission' aspect of UAS operations."[16] Those monitoring the industry already know that online content and various media outlets related to public safety and homeland security are accessible to the FAA. At the very least, the modern industry looks at UAS use cases and debates issues such as the impact upon the Final Rule implementation of ADS-B Out for 2020. Even through traditional means, at the same July 2012 Senate Subcommittee hearing, the public safety risks of reliance of civilian GPS technologies are debated.

2. Would it be helpful to establish three working groups with one focusing on privacy, one on transparency, and one of accountability? Should such working groups work in serial or parallel?

It would be helpful, but may not encompass the entirety of domestic and international variables. The work should be conducted dynamically using flexibility. The above paragraph is incorporated here. Also see above, *Noted Comment 1* and *2*.

[16] *Ibid.*
Arguably a sentiment from a professional or local community, Chief Deputy McDaniel writes: **"FAA staffers do not have the law enforcement, fire, or emergency management background to be able to relate to the mission of these agencies."** While the Chief Deputy's Written testimony debates the hierarchy on the last page, it is the preceding pages that may resemble general *civic* and *local community*(ies) imagination to use the technology to render aid or provide an emergency service, and some case-specific federal impediments to community service the Sheriff's Office experienced.

3. **Would it be helpful for stakeholders to distinguish between micro, small, and large UAS platforms (e.g. UAS under 4.4 lbs., UAS between 4.4 lbs. and 55 lbs., and UAS over 55 lbs.)? Do smaller or larger platforms raise different issues for privacy, transparency, and accountability?**

It would be helpful. Distinction, as determined by operating weight, appears logical. For example, there may be a threshold where micro Unmanned Aircraft (mUA) technology is no more advanced than comparable sUAS (the sole variable is aircraft size). The threshold in the example is not static. Many issues can be developed. Also see above, *Noted Comment 1* and *2*.

4. **What existing best practices or codes of conduct could serve as bases for stakeholders' work?**

Illustrated in *number 1* above, best practices which may easily apply to this disruptive technology may already exist. This notion extends to any codes of conduct or other similar existing instruments. For example, an organization could maintain best practices for data retention of electronic files created by a video surveillance system. The practice could have a potential for development, with minimal effort, for implementation as a UAS best practice. Many practices may exceed conservative parameters depending on user or business decisions or agency missions; those which may practically apply to NTIA initiatives should be considered over a lower ranked standard. Also see above, *Noted Comment 1* and *2*.

Privacy

5. **UAS can be used for a wide variety of commercial and private purposes, including aerial photography, package delivery, farm management, and the provision of Internet service. Do some UAS-enabled commercial services raise unique or heightened privacy issues as compared to non-UAS platforms that provide the same services? For example, does UAS-based aerial photography raise unique or heightened privacy issues compared to manned aerial photography? Does UAS-based Internet service raise unique or heightened privacy issues compared to wireline or ground-based wireless Internet service?**

There are UAS services that may raise unique or heightened privacy issues as compared to similar services on other platforms. The public safety concerns in *number 1* above are incorporated here. The aerial photography scenario could be plausible. The internet service scenario could be plausible. Generally speaking regulation, statute or law(s) could exist which may be correctly applied to services provided by UAS. Also see above, *Noted Comment 1* and *2*.

6. Which commercial and private uses of UAS raise the most pressing privacy challenges?

There are undetermined amounts of potential privacy challenges that could be discussed. One example would be the time period that an electronic file created — commercially or privately — may be required to be maintained or destroyed. Also see above, *Noted Comment 1* and *2*.

7. What specific best practices would mitigate the most pressing privacy challenges while supporting innovation?

Current and potential unidentified mitigating practices which support innovation may exist. Generally speaking, innovative efforts are constrained in instances where its activity is rigidly governed. As mitigation of legal actions relate to privacy best practices of UAS, legal precedence may serve as guiding boundaries or thresholds. Supreme Court rulings possibly significant while considering aviation parameters may include *United States v. Causby* (1946), *Dow Chemical Co. v. United States* (1986), *Florida v. Riley* (1989), and *California v. Ciraolo* (1986). Supreme Court rulings possibly significant while considering technology-related privacy parameters may include the following recent decisions: *Kyllo v. United States* (2001), *United*

States v. Jones (2012), and *Riley v. California* (2014). Logically, the composition of the current Bench should be considered. The NJIT Working Group suggests that UAS policy or legislation shall also account for legal precedence while also considering our Justices record regarding (disruptive) technology rulings. Also see above, *Noted Comment 1* and *2*.

Transparency

8. **Transparent UAS operation can include identifying the entities that operate particular UAS, the purposes of UAS flights, and the data practices associated with UAS operations. Is there other information that UAS operators should make public?**

The UAS information in this question could be logical. Likely, some factions may emerge which promote or discourage the amount or information required for transparency. This Comment suggests that the group (NTIA-led or other) be charged with making the determination which balances PII and transparency. Also see above, *Noted Comment 1* and *2*.

9. **What values can be supported by transparency of commercial and private UAS operation? Can transparency enhance privacy, encourage reporting of nuisances caused by UAS flights, or help combat unsafe UAS flying? Can transparency support other values?**

Well-informed morally-centered values may generally apply to transparency with minimal criticism. Of note; life-saving, humanitarian, civic duty and community services are users identified to experience increased benefit from UAS innovation. The NJIT Working Group's FAA NPRM highlights that the services mentioned would be regulated by the proposed rule. Otherwise, transparency can support many other values. Also see above, *Noted Comment 1* and *2*.

10. How can companies and individuals best provide notice to the public regarding where a particular entity or individual operates UAS in the NAS?

An example of an efficient notice would be an internet-accessible portal or webpage. An inefficient notice would be yearly postings only to a physically printed publication. There are numerous other variables. Also see above, *Noted Comment 1* and *2*.

11. What mechanisms can facilitate identification of commercial and private UAS by the public? Would standardized physical markings aid in identifying UAS when the aircraft are mobile or stationary? Can UAS be equipped with electronic identifiers or other technology to facilitate identification of UAS by the public?

In its Comment to the FAA NPRM, the NJIT Working Group suggests that the registration ("N" number) of unmanned aircraft be listed as "NX*" to clearly identify an aircraft with no souls on-board either airborne or listed in a registration directory. If exercising an incremental approach, standardized physical markings would be logical for identification. Thereafter, electronic identifier(s) may be employed as deemed appropriate. Also see above, *Noted Comment 1* and *2*.

12. How can companies and individuals best keep the public informed about UAS operations that significantly impact privacy, anti-nuisance, or safety interests? Would routine reporting by large-scale UAS operators provide value to the public? What might such reporting include? How might it be made publicly available?

If the U.S. elects to employ practices born of analysis from foreign data, UAS approaches that may be examined could include any impacts which *Article 8 of the European Convention on Human Rights,* U.K.'s Data Protection Act of 1995, or *EU Directive 95* may have directed airborne operations in Europe for the interests listed. Another valuable UAS-specific resource may be the reports published in 2013 by the European Commission (EC) 7th Framework

Programme (FP7) following an 18-month multi-stakeholder collaborative called project ULTRA— **U**nmanned Aeria**l** Sys**t**ems in Eu**r**opean **A**irspace.[17] Also see above, *Noted Comment 1* and *2*.

13. What specific best practices would promote transparent UAS operation while supporting innovation?

Innovative efforts are constrained in instances where its activity is rigidly governed. *Number 7* above is incorporated here. Also see above, *Noted Comment 1* and *2*.

Accountability

14. UAS operators can employ accountability mechanisms to help ensure that privacy protections and transparency policies are enforced within an organization. How can companies, model aircraft clubs, and UAS training programs ensure that oversight procedures for commercial and private UAS operation comply with relevant policies and best practices? Can audits, assessments, or reporting help promote accountability?

The suggestions made in this question can reasonably promote accountability. Above *number 1* and *4* are incorporated here. Also see above, *Noted Comment 1* and *2*.

15. What rules regarding conduct, training, operation, data handling, and oversight would promote accountability regarding commercial and private UAS operation?

Numerous suggestions can be created in reply to this question. A community discussion of government, commercial, and private obligations would likely serve an appropriate starting

[17] ULTRA (Unmanned Aerial Systems in European Airspace) — initiated and funded by the European Commission Seventh Framework Programme — was an 18-month collaboration of the most relevant stakeholders which studied "Use Cases" to be explored as "quick win" business cases; things their economy could benefit from in their airspace within five (5) years. In total, ULTRA published eleven (11) reports in 2013.

point. As it may apply, above *numbers 1, 4,* and *14* are incorporated here. Also see above, *Noted Comment 1* and *2*.

16. What specific best practices would promote accountable commercial and private UAS operation while supporting innovation?

A best practice which is agreeable to most or all stakeholders may typically endure scrutiny over those which discount a stakeholder(s) interest. Lacking context, see above *Noted Comment 1* and *2*.

NOW, IT IS, THEREFORE, respectfully submitted, the New Jersey Institute of Technology Unmanned Aircraft Systems Applied Research Working Group comment, in accordance with the method specified in the RFC, properly identifying docket number 150224183-5183-01 via email transmission (receipt confirmation requested) to *UASrfc2015@ntia.doc.gov*.

DATE: April 20, 2015