

# Video Quality in Public Safety (VQiPS) Workshop



Homeland  
Security

Science and Technology

MAY 9-10, 2018 | ALBUQUERQUE, NEW MEXICO



## 2018 Video Quality in Public Safety (VQiPS) Workshop Summary Report

August 27, 2018



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## Workshop Overview

**Date:** May 9-10, 2018

**Location:** Hyatt Regency Hotel, Albuquerque, New Mexico

**Purpose:** To engage the public safety video community in order to:

1. Provide a forum for end users, government, academia and industry to learn from each other as well as share the current state and future direction of video use in public safety.
2. Help public safety professionals meet their video system planning, designing, operating and sustainment needs through development of technology and policy consideration focused knowledge products.

**Outcomes:**

1. Shared understanding of the Video Quality in Public Safety (VQiPS) program and tools.
2. Gather feedback on the future direction of the VQiPS program.
3. Increased awareness of developing technologies, promising practices, challenges and lessons learned.
4. Enhanced understanding of user needs, including acquisition, concept of operations and policy issues.

**Participants:** Public safety and first responder representatives from law enforcement, fire service, emergency medical, emergency management and dispatch from across the country, along with state, local and federal staff, public television, academia and private industry.

**Full Agenda:** See Appendix A

**Panel Summaries:** See Appendix B

The 2018 Workshop was planned and executed by the VQiPS Leadership Team (LT) with close coordination and assistance from VQiPS Program Manager Cuong Luu and DHS Science and Technology (S&T) Office for Interoperability and Compatibility (OIC) support staff. DHS OIC would like to thank Victoria Garcia, New Mexico Department of Information Technology (DoIT), who agreed to be our local champion for the Workshop. Her support of the Workshop, along with her department's support, was invaluable. Ms. Garcia assisted with securing several key speakers, including the city of Albuquerque CIO, Albuquerque Police Department's Real Time Crime Center Manager and the Secretary of the New Mexico DoIT. More than 100 people from local, state, tribal and federal government agencies, academia, standards development organization representatives and industry attended the Workshop. The two-day Workshop featured more than 30 panelists spread over



*Figure 1 - Cuong Luu opens the workshop*

16 sessions, covering topics including policy considerations for video use, analytics, forensics, mobile video and multiple case studies.

Issues, challenges, priorities and gaps discussed by the panels and with audience participation help inform the direction of the VQiPS Program and the solutions (new technology or knowledge products) that the program leadership continues to pursue. This event also provided an opportunity to review and validate current priorities and focus areas. DHS OIC used the two-day Workshop to also find out the best way for stakeholders to digest their information (e.g., social media, newsletters, etc.) to more effectively communicate VQiPS activities. Attendees also had the benefit of hearing different lessons learned and best practices from practitioners from across the country who are facing similar issues within their agencies.

Panel presentations and related handouts from the event are posted on the event page: <http://www.cvent.com/d/btqq9l>.

## Results and Feedback

**Participant Feedback:** The last session of the Workshop was reserved for participant feedback, which provided all attendees with an opportunity to speak on issues they found important, ask longer-term follow up questions, or bring up things that the leadership team should focus on moving forward.

DHS OIC/Workshop Recommendations:

- Address non-technology aspects that impact public safety agencies:
  - Policy;
  - Governance; and
  - Training.
- Explore ways to educate decision makers and influencers.
- Address the integration of other sensors that complement video.
- Continue to bridge academia with public safety.
- Explore the use of game technology to conduct predicative analytics.
- Find ways to better engage the tribal communities.
- Expand VQiPS stakeholders to include corrections facilities.
- Investigate the benefits of intelligent traffic design (e.g., traffic cameras) on public safety.
- Engage traffic engineers and Departments of Transportation as VQiPS stakeholders.
- Document the considerations that should be made when implementing a document management system.
- Consider changing VQiPS name to align with broadened scope of program.
- Integrate researchers with end users to better understand real world applications.
- Build more sessions that address smaller cities/budget agencies.

Future Workshop speaker/panel recommendations:

- Conduct research-style, technical presentations that explore the effectiveness of specific algorithms and approaches to measuring data and broader outcome assessments.
- The additional Fire Service presentations were a plus; try to include more emergency medical services (EMS) presentations:

- Video in healthcare and FirstNet's expected impact.
- Increase focus on border control use of video.
- Effects of governance on video.
- Video forensics.
- Highlight Scientific Working Group on Digital Evidence (SWGDE) activities, specifically on redaction, general best practices and audio.
- Video evidence storage and policies (e.g., Freedom of Information Act (FOIA)).
- Video retention and benefits of cloud storage.
- Satellite systems.
- How to move data (video).
- Video edge analytics.
- Video analytics on successful use cases from the field.
- Video integration solutions.
- Millimeter wave radar.
- Infrared or thermal imaging technology for unmanned aerial vehicles/systems (UAV/S).
- More technology implementation focused panels (e.g., body worn camera).
- Custodial/Non-custodial interview systems: fixed and portable (not body/vehicle).
- Internet of Things and impact on video.
- Future complications for enhanced video (e.g., problems with storage).
- Real-time crime center, situational awareness platforms and citywide surveillance.

**After Actions:** Some ideas and suggestions were brought up by so many people or were so widely accepted by general agreement that the LT has already resolved to focus on them moving forward.

1. Policy Document – The document is good, but not very accessible. The Policy Considerations document would benefit from a shorter, more easily digestible Executive Summary version. It should list the considerations discussed in the full document and then point the reader to the full document for more details.
2. Communications – There was a recommendation to develop a newsletter or informative email with articles highlighting public safety video use. One possibility that was discussed was to create an online forum where people can ask questions and others with experience (including VQiPS LT members) can respond. DHS OIC will explore the idea of establishing a VQiPS email address where anyone can send in a question and the LT can respond or at least point them in the direction of someone who might be able to help. Another recommendation is to revisit how VQiPS information is displayed on the website. Currently, documents, videos and other material are disjointed and can be difficult to find. DHS OIC will attempt to make the website and VQiPS related tools more easily accessible to users.
3. Broader Distribution – The speakers and panel sessions were very beneficial to those in attendance, but there is currently no way to distribute this information more broadly. DHS OIC will look into making recordings of the sessions available for posting on the S&T website or other online forums.

## VQiPS Background

**Vision:** A collaborative environment accelerates the ability of users to specify and deploy video technology solutions that meet their requirements and improve public safety and homeland security enterprise operations.

**Mission:** Create knowledge products; foster a knowledge-sharing environment, and support research, development, testing and evaluation for enhanced video quality through measurable, objective and standards-based solutions across the full spectrum of video-use cases for the public safety community.

First responders rely heavily on video technology to increase their situational awareness while responding to an incident, monitoring the situation from afar, or conducting day-to-day public safety activities. As video technology has evolved, equipment options have become increasingly more complex. Many first responder agencies lack the tools and subject matter expertise needed to make informed video system purchasing decisions, so they often turn to manufacturers to direct them. The [Video Quality in Public Safety \(VQiPS\) initiative](#) provides information and support to first responders so they can articulate their video quality needs and ultimately buy the best products to fit their unique needs.

VQiPS develops assessment tools and guidance documents to enable first responder agencies to purchase and deploy appropriate video technology to meet their operational needs. Purchase and deployment of systems by first responder agencies in accordance with VQiPS guidance will enhance video system interoperability within and across agencies. The DHS Science and Technology Directorate's (S&T) Office for Interoperability and Compatibility (OIC) coordinates disparate video standard development efforts to ultimately arm public safety consumers with the knowledge they need to purchase and deploy cost-efficient, interoperable video systems.



*Figure 2 - Participants listening to a Workshop presentation*

## Appendix A: Full Agenda

Wednesday, May 9, 2018

Session #	Agenda Item	Time
<b>Registration</b>		<b>7:30-8:30 a.m.</b>
<b>1</b>	Welcome, Workshop Overview and OIC Update <ul style="list-style-type: none"> <li>Francisco Soares, DHS Office for Interoperability and Compatibility (OIC) Support</li> <li>Cuong Luu, DHS OIC Program Manager</li> <li>John Merrill, DHS OIC Director</li> </ul>	8:30-9:00 a.m.
<b>2</b>	Local Presentations <ul style="list-style-type: none"> <li>Darryl Ackley, Secretary, New Mexico Department of Information Technology</li> <li>Don Lewis, Manager, Albuquerque Real Time Crime Center</li> </ul>	9:00-9:45 a.m.
<b>3</b>	Policy Considerations for Video – What’s next? <ul style="list-style-type: none"> <li>Moderator: John Contestable, Program Manager, Johns Hopkins University/Applied Physics Laboratory (JHU/APL)</li> <li>Don Zoufal, Esq., Lecturer/Consultant, University of Chicago/SDI Presence, LLC</li> <li>Jenny Hansen, Assistant Director, City of Reno – Public Safety Dispatch</li> <li>Victoria Garcia, Esq., Deputy State Point of Contact, NM Department of IT</li> </ul>	9:45-10:45 a.m.
<b>Break</b>		<b>10:45-11:00 a.m.</b>
<b>4</b>	Video Analytics in Public Safety <ul style="list-style-type: none"> <li>Moderator: John Garofolo, Department of Commerce, National Institute of Standards and Technology (NIST) – by phone</li> <li>Mark Keough, Deputy Chief, Mesa Fire and Medical</li> <li>Dr. Shishir Shah, Professor, University of Houston</li> <li>Dr. Alex Hauptmann, Professor, Carnegie Mellon University</li> <li>Hinrich Schmidt, Video Consultant, Smarter2Stream, LLC</li> </ul>	11:00 a.m.- 12:30 p.m.
<b>Lunch</b>		<b>12:30-2:00 p.m.</b>
<b>5</b>	Datacasting <ul style="list-style-type: none"> <li>Moderator: Lonna Thompson, EVP &amp; General Counsel, America’s Public Television Stations</li> <li>Franz Joachim, General Manager &amp; CEO, New Mexico Public Broadcasting Service</li> <li>Jeff Cook, District Chief, Houston Fire Department</li> <li>Mark O’Brien, President – CTO, SpectraRep</li> </ul>	2:00-3:00 p.m.
<b>6</b>	Body Worn Camera (BWC) Perception Study Research Gap Analysis <ul style="list-style-type: none"> <li>Dr. David Makin, Professor, Washington State University</li> </ul>	3:00-3:30 p.m.

Session #	Agenda Item	Time
<b>Break</b>		<b>3:30-3:45 p.m.</b>
7	Industry Panel <ul style="list-style-type: none"> <li>• Moderator: Paul Patrick, Utah Department of Health</li> <li>• Scott Hamasaki, Illuminar</li> <li>• Alex Popof, Visual Labs</li> <li>• Chris Miter, Salient Systems</li> <li>• Hayder Kafhim, Genetec</li> </ul>	3:45-4:30 p.m.
8	Case Studies: Law Enforcement Focus <ul style="list-style-type: none"> <li>• Moderator: John Powell, Los Angeles County Sheriff's Department (ret.)</li> <li>• Chad Carpenter, Special Agent, South Dakota Division of Criminal Investigation</li> <li>• Brandon Epstein, Detective Sargent, New Brunswick Police Department Criminal Investigations Division</li> <li>• Eddie Winters, Lieutenant, Chicago Police Department</li> </ul>	4:30-5:30 p.m.
<b>Day One Closing Remarks</b>		

Thursday, May 10, 2018

Session #	Agenda Item	Time
<b>Regroup &amp; Recap</b>		<b>8:15-8:30 a.m.</b>
9	Local Presentation <ul style="list-style-type: none"> <li>• Peter Ambs, CIO, City of Albuquerque</li> </ul>	8:30-9:00 a.m.
10	Industry Panel <ul style="list-style-type: none"> <li>• Moderator: Paul Patrick, Utah DoH</li> <li>• Joseph Hoellerer, Security Industry Association</li> <li>• Boaz Raz, EAGL Technology</li> <li>• Will Addison, SeeQuestor, Inc.</li> <li>• Doug Schmidtknecht, Idemia NSS</li> </ul>	9:00-9:45 a.m.
11	Wearables/Mobility Video Use <ul style="list-style-type: none"> <li>• Moderator: John Powell, Los Angeles County Sheriff's Department (ret.)</li> <li>• Jesse Orozco, Public Safety Director, Pueblo of Laguna, NM</li> <li>• Jesus Valenzuela and Ron Campbell, Seattle Police Department</li> </ul>	9:45-10:45 a.m.
<b>Break</b>		<b>10:45-11:00 a.m.</b>
12	Industry Lab	11:00-11:30 a.m.
13	DHS Digital Forensics Program <ul style="list-style-type: none"> <li>• Patty Wolfhope, Program Manager, DHS Science and Technology Directorate</li> </ul>	11:30 a.m.- 12:00 p.m.
<b>Lunch</b>		<b>12:00-1:30 p.m.</b>



Session #	Agenda Item	Time
14	UAS/UAV Video Use <ul style="list-style-type: none"> <li>• Moderator: Gabe Pacheco, DHS Customs and Border Protection</li> <li>• Neal Landfield, Arlington, TX Police Department</li> <li>• Jon Melvin, Grant County (WA) Sheriff's Office</li> <li>• Brian Kotsur, Deputy Shift Commander, Mesa Fire and Medical</li> </ul>	1:30–2:45 p.m.
<b>Break</b>		<b>2:45-3:00 p.m.</b>
15	Case Studies: Video Use on College Campuses <ul style="list-style-type: none"> <li>• Moderator: John Contestable, JHU/APL</li> <li>• David Mitchell, Director of Public Safety - Chief of Police, University of Maryland</li> <li>• Sam Hinojosa, Chief Technology Officer and Bob Oleinik, Associate Director, Campus Security Systems, University of Southern California</li> </ul>	3:00-4:00 p.m.
16	Open Session – New Priorities, Way Forward <ul style="list-style-type: none"> <li>• Moderator: Francisco Solares, DHS OIC Support</li> </ul>	4:00-5:00 p.m.
<b>Workshop Closing Remarks</b>		

## Appendix B: Panel Summaries

Panel #	Summary
1	<p>Welcome, Workshop Overview and OIC Update: The Workshop was opened by the facilitator who provided an overview of the events of the next two days. VQIPS Federal Program Manager Cuong Luu welcomed everyone and thanked the local champion, Victoria Garcia, New Mexico Department of Information Technology (DoIT), for all her support in helping to make the Workshop a success. Mr. Luu also acknowledged Secretary Darryl Ackley, New Mexico DoIT for his leadership. Mr. Luu showed a brief video on video analytics to baseline the audience’s understanding of the topic, as this topic would run across several panel sessions. He next introduced the Director of OIC John Merrill who welcomed everyone to the Workshop, and then provided a brief presentation on the initiative and the Next Generation First Responder (NGFR) <a href="#">Apex Program</a>. This program is part of a longer-term S&amp;T commitment to envision and assist the responder of the future. NGFR continually collaborates with first responders across the nation on various projects, from developing program requirements to testing prototypes. These cutting-edge technologies will improve emergency response time and accelerate decision-making to save more lives.</p>
2	<p>Local Presentations: The audience heard from Secretary Ackley, New Mexico DoIT, and Don Lewis, Albuquerque Police Department (PD). Secretary Ackley highlighted the impact that the creation of the FirstNet nationwide public safety broadband network would likely have on video. Secretary Ackley also spoke about the role that New Mexico DoIT plays in public safety across the state. Mr. Lewis gave the audience an overview of the Albuquerque PD’s Real Time Crime Center (RTCC). He highlighted the initial challenges (e.g., funding, buy-in, technology) the department faced when they stood up the RTCC, as well as how these challenges were met. Mr. Lewis then walked the attendees through a successful use of the RTCC that led to the apprehension of suspects. He spoke generally about the impact of the RTCC on the city of Albuquerque. Finally, he highlighted their current use of video analytics and spoke about some of the future video technology areas they hope to see continue to mature.</p>







Panel #	Summary
9	<p>Local Presentation: Peter Ambs, CIO for the City of Albuquerque highlighted the city’s Smart City initiative and the broader benefits that the Internet of Things, or IoT, movement is creating. Albuquerque is ranked as one of the top smart cities in the United States. The city has in-ground sensors for irrigation systems, in the air, etc. The city is made up of 23 different agencies whose data they are attempting to bring to bear to improve the performance of the city’s overall services. Mr. Ambs spoke about his desire to create a data science layer to learn from the information currently available, as well as identify the cause and effect across different city departments. Mr. Ambs spoke about how the city must compete with companies such as Amazon because that is the expectation of his residents. They have come to expect a certain level of service in the commercial sector, which he is attempting to replicate in the public sector. Mr. Ambs highlighted one of the city’s major initiatives, which is attempting to replace all the city streetlights with LED lights outfitted with plug-ins for all types of future sensors.</p>
10	<p>Industry Panel: This session kicked off with a presentation from the Security Industry Association (SIA), a trade group representing security companies. They have a Public Safety Working Group working on a Tactical and Smart Solutions Handbook, which is due for completion in October 2018. Their annual summit will be June 27-28 in Washington, DC. EAGL Technologies provided an overview of their auto gunshot lockdown system, which is a fully automated gunshot detection and building lockdown device. The basic system architecture was presented and the company boosts outdoor gunshot detection accuracy in the six-sigma range with no false alarms indoors. Idemia NSS presented their intelligent solutions for law enforcement, including video analytics and Edge computing, citing computer power as an ongoing issue. Examples of their work include analytics for the Boston bombing and Navy Yard shooting, and a touchless ID system at the University of Maryland. SeeQuestor wrapped up the session discussing the “third forensic” of video. Some challenges are lack of standardization in hardware, recording and storage. They have three petabytes of computer processing power. Artificial Intelligence is not replacing humans right now, but it is coming.</p>
11	<p>Wearables/Mobility Video Use: Representatives from the Seattle Police Department (PD) and Pueblo of Laguna (NM) spoke about how their respective agencies use body worn cameras. Workshop attendees learned about how Seattle PD determined which body worn cameras to use for their program, as well as why they chose to use cloud-based storage. Seattle PD showed videos from their testing exercises to demonstrate the rigor that they put their body worn cameras through. Seattle PD also highlighted some of the storage challenges that they face with body worn cameras as compared to previous video storage needs. The Public Safety Director from the Pueblo of Laguna spoke about the evolution of their body worn camera program, including funding challenges in the initial stages. He also spoke about some of the unique considerations that officers in tribal communities must face (i.e., traditional, ritual) as opposed to officers in other non-tribal communities. He then highlighted lessons learned from his body worn camera implementation, including those related to storage and stakeholder involvement.</p>
12	<p>Industry Lab: This time was set aside to ensure participants had an opportunity to talk with industry representatives and view the table displays. Nine companies set up table displays in the back of the conference room: all seven of the industry panel participants plus two additional companies, Axon and Vintra.</p>

Panel #	Summary
13	<p>DHS Digital Forensics Program: Patty Wolfhope, DHS FRG Program Manager, gave an overview of several projects within her Digital Forensics portfolio, including Face In Video Evaluation (FIVE), Child Exploitation Image Analytics and Language ID Prototype. She gave attendees an overview of the levels of facial recognition cooperation. She also highlighted some of the published results from the FIVE project, which can be found on the <a href="#">NIST website</a>. Ms. Wolfhope spoke about the importance of understanding your application (e.g., perimeter security, watch list, criminal investigation) to get the most out of the technology. Regarding her work in Child Exploitation Image Analytics, she highlighted the outstanding need for an efficient, automated method of detecting and recognizing images or video that include faces of people. Finally, she spoke about a language identification project where the current prototype technology can identify more than 45 different languages to assist first responders with identifying the origin of the video.</p>
14	<p>Unmanned aerial system (UAS) / unmanned aerial vehicle (UAV) Video Use: UAS/UAV video use is an area of rapid growth in the public safety community. This panel brought together both law enforcement and fire service community members to speak about different video applications. The Arlington (TX) Police Department has a mature program as they have been using UAS since 2011. The presenter spoke about the evolution of UAS technology that the department went through. He also provided lessons learned, including the importance of public relations when it comes to UAS as well as the dangers of being the first to implement a new technology solution. Grant County (WA) Sheriff's Department conducted a test and evaluation exercise with DHS FRG last year. One of the primary objectives of the exercise was to demonstrate the ability to use datacasting technology, specifically on the television white space spectrum, to send the video from the UAV back to command, which was successfully done. The audience was able to see actual video from the exercise to better understand the terrain and environment within which this technology had to be used. Finally, the Program Manager for the Mesa (AZ) Fire and Medical Department spoke about how his agency uses UAS. He highlighted the classic challenges with regulations (e.g., Certificate of Authorization) in the UAS environment and how his agency was able to get its UAS program off the ground. Attendees also saw video captured from a real-life warehouse fire where the benefits of maintaining a UAS program really became known. During this incident, the boots on the ground and on-scene commander thought that they had contained the fire given their vantage point. The UAS was able to obtain a different perspective that showed the fire was not contained and in fact growing stronger on the opposite side of the warehouse. Once the on-scene commander was made aware, he was able to reallocate assets accordingly and successfully put out the fire.</p>

Panel #	Summary
15	<p>Case Studies: Video Use on College Campuses: Attendees heard from the Chief of Police at the University of Maryland (UMD) and the Chief Technology Officer and Associate Director for Campus Security at the University of Southern California (USC). UMD maintains its own security operations center, which is actually monitored by part-time student employees. They have hundreds of cameras across campus and most recently started to install cameras at residence halls to protect against theft. UMD police coordinate with neighboring law enforcement agencies, including Prince George’s County PD, its largest partner. They use video on a day-to-day basis, including during large events or when they have high-profile guests on campus. USC has both actively and passively monitored cameras. They also maintain a communications center to monitor for school safety, but also for misuse of university property. The USC speakers highlighted a recent event where the license plate recognition cameras picked up a stolen vehicle and then they coordinated a response with LAPD, which resulted in the apprehension of the suspect. Students at USC have the ability to report suspicious activity through a mobile app, which in turn allows the communications center to monitor video in the area. USC currently uses video analytics to alert the people monitors of unusual scenes that may be developing. They also use game theory for asset allocation.</p>
16	<p>Open Session – New Priorities, Way Forward: Discussion session to review what was achieved at the Workshop, what can be improved, and identify new areas and knowledge products for the leadership team to focus on before the next Workshop. Feedback and after actions are captured in the Workshop Report section above.</p>