NTIA Memorandum 19-538

ITS4S3: A Video Quality Dataset With Unrepeated Videos, Camera Impairments, and Public Safety Scenarios

Margaret H. Pinson

technical memorandum

U.S. DEPARTMENT OF COMMERCE • National Telecommunications and Information Administration

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DISCLAIMER

Certain products, technologies, and corporations are mentioned in this report to describe the experiment design. The mention of such entities should not be construed as any endorsement, approval, recommendation, prediction of success, or that they are in any way superior to or more noteworthy than similar entities that were not mentioned.

PREFACE

This memorandum is part of a series of NTIA Technical Memorandums. Each publication describes a subjective experiment that is named in series and distributed freely on the Consumer Digital Video Library (CDVL, www.cdvl.org) for research and development purposes. These experiments provide training data for no-reference (NR) metrics that focus on consumer camera applications. The reader is expected to have some knowledge of subjective experiments. A tutorial on this subject can be found in "Video Quality Assessment: Subjective testing of entertainment scenes," by Margaret H. Pinson, Lucjan Janowski, and Zdzislaw Papir, published in *IEEE Signal Processing Magazine*, January 2015.

The subjective video quality experiment described by this memorandum, referred to as the **its4s3** experiment, was conducted according to ITU-T Rec. P.913 edition 2.0 (approved March 15, 2016). ITU-T Rec. P.913 is better suited for consumer camera applications than the renowned ITU-R Rec. BT.500. While ITU-R Rec. BT.500-13 recommends at least 15 subjects, ITU-T Rec. P.913 recommends at least 24 subjects in a controlled environment for greater quality of the study results. Due to experiment resource constraints, this memorandum includes data from fewer subjects and must therefore be considered a pilot study.

Our intention is to collect data from additional subjects and make that subjective data available at a future time. Nomenclature will be added at that time, to distinguish between the partial and full subjective data (from at least 24 subjects). The pilot study data is made available immediately, to assist related technical efforts being performed by industry, academia, and standards developing organizations.

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GLOSSARY OF TERMS

Clip	The base unit of this subjective test: a 4 s video clip
FPS	Frames per second or fields per second
NR	No-reference
NR Metric	A metric that predicts the quality of an image or video using only the image or video itself (i.e., pixels) without referencing the bit-streams, coding parameters, or a higher quality version of the image or video
Original Resolution	The resolution as recorded by the camera
Viewed Resolution	The resolution presented to the subjects (1920 × 1080)

ITS4S3: A VIDEO QUALITY DATASET WITH UNREPEATED VIDEOS, CAMERA IMPAIRMENTS, AND PUBLIC SAFETY SCENARIOS

Margaret H. Pinson[1]

This technical memorandum provides technical details for the video quality subjective experiment **its4s3**. This experiment includes 594 videos, each 4 seconds in duration. The experiment consists of six sessions, each portraying a different public safety scenario. The goals of this experiment are to demonstrate a wide range of quality responses from digital video cameras; to present video sequences suitable for first responder tasks; to begin to understand the video quality difference between video used as evidence and video used for situational awareness; and to collect data from a more representational sampling of people than is usually possible, by conducting the experiment at a large meeting venue. The **its4s3** dataset is intended to train no-reference (NR) video quality metrics. The dataset is freely available for research and development purposes.

Keywords: camera capture, no-reference metric, public safety, subjective testing, video quality

1. INTRODUCTION

Subjective video quality experiment **its4s3** is the third experiment conducted in a continuing series of experiments. All three experiments were designed to provide insights into video quality metrics that evaluate camera capture. The videos in the **its4s3** dataset represent common scenarios encountered by first responders. These videos characterize the entire camera capture pipeline (i.e., sensor, image processing encoder, decoder, and display). The dataset contains impairments associated with the camera, the camera operator, and the environment where the video was recorded.

Our objectives are to enable (1) intelligent cameras that help first responders record videos and photographs that satisfy their needs, and (2) intelligent networks that take video quality into consideration (e.g., to optimize the use of network transmission resources). To achieve these objectives, technical innovations are required, including the development of a metric that can analyze the quality of video in real-time, using only the video sequence as an input. Referred to as a no-reference (NR) metric, this type of metric has proven to be a very challenging development problem.

Our prior two experiments in this series were **its4s** [1] and **its4s2** [2]. Experiment **its4s** established an innovative new experiment design for training no-reference (NR) video quality metrics. The design was implemented within the context of an adaptive streaming bitrate ladder, such as [3]. Experiment **its4s2** focused on impairments stemming from the camera capture itself

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(e.g., lens flare, aspect ratio, amateur photography). Experiment **its4s2** was limited to still images and includes content that causes complex interactions when moving (e.g., confetti, water, high contrast edges, rain). Both **its4s** and **its4s2** split stimuli into multiple sessions, such that each session presents different scenarios to the subject (e.g., landscapes in one session, travel photography in another). The goal was to entertain the subject, thus reducing subject fatigue. See [1] and [2] for further background information on the motivations and experiment designs for **its4s** and **its4s2**.

The video quality experiment described in this memorandum, **its4s3**, is similar to the previous **its4s2** image quality experiment, in that the camera is directly responsible for both the source video and all impairments to be studied. Unlike the prior two experiments, **its4s3** concentrates solely on first responder subject matter. The goals for this experiment are to demonstrate a wide range of quality responses from modern digital cameras; to focus the subjects on first responder needs; to begin to understand the difference between video used as evidence and video used for situational awareness; and to collect data from a more representational sampling of people than is usually possible, by conducting the experiment at a large meeting venue (i.e., the 2018 Public Safety Communications Research (PSCR) Public Safety Broadband Stakeholder Meeting).

Experiment **its4s3** evaluates videos that were commissioned by ITS for this experiment; professional videographers filmed content that simulates the type of footage that first responders create and use during their jobs. Video clips were selected from that footage, with a goal of representing most situations and camera responses portrayed by the raw footage. The experiment consists of six sessions, each with a different scenario (e.g., search and rescue, post-fire investigation, crime scene). In total, **its4s3** contains 594 video clips, each of 4 seconds duration. The dataset is available freely for research and development purposes, as per the May 09, 2013 Executive Order, "Making Open and Machine Readable the New Default for Government Information."

The experiment adhered to ITU-T Rec. P.913. All videos were rated using a modified version of the absolute category rating (ACR) scale (see Section 3.1). Due to the large size of the dataset and the busy meeting venue, each subject rated only one-sixth (99) of the videos. A few subjects rated two-sixths of the videos (198), at their discretion.

The remainder of this report provides a detailed description of the **its4s3** experiment. The video sequences and ratings are available on the Consumer Digital Video Library (CDVL, www.cdvl.org).

2. EXPERIMENT DESIGN

2.1 Session Descriptions

Experiment **its4s3** is designed around six sessions. Each session portrays a different scenario that is commonly encountered by first responders. In some scenarios, first responders are making real-time decisions. In other scenarios, first responders are watching recorded videos. The videos were edited, transcoded, and resized, but were otherwise unchanged from the original camera recordings. Footage for the first five sessions was commissioned in late 2017; the sixth session was filmed in 2010. Figure 1 shows sample frames from each session.

Session “Crime Scene” depicts a simulated death investigation at dusk, recorded with a variety of handheld cameras. Similar video recordings are used by first responders to document scenes, record ephemeral events, depict evidence, and show accident scenes to emergency room physicians. The setting is a patio. The crime scene contains a handgun and shell casings but is non-explicit (rated “G”). The scene was filmed with various handheld cameras during natural lighting conditions that span late afternoon through full night. Sometimes, a flashlight is the primary source of illumination. See Appendix B.2 and B.6 for the instructions provided to the videographer. The crime scene depicted is realistic, except for the occasional officer shown on-camera, but the videography is not realistic. This footage shows camerawork typical of television or movies; the techniques of trained law enforcement officers differ.

Session “Crime Walkthroughs” depicts four simulated death investigations with decedents. The point-of-view is that of an officer documenting the crime scene. The footage contains four different scenarios: river side, dumpster, vehicle, and kitchen. The footage was filmed by two different videographers, each responding to the instructions provided in Appendix B.2 and B.6. The raw footage included an officer talking about the scene, but that audio is not used for this experiment. This session includes simulated violent death (rated “R”). As with the “Crime Scene” session, the crime scenes depicted are realistic, but the videography is not realistic.

Session “Fireground” depicts the aftermath of a neighborhood fire, on a sunny afternoon. The site was filmed with a variety of bodycams and handheld cameras. Similar video recordings are used during fire and arson investigations. The lighting is full sun, resulting occasionally in lens flare. See Appendix B.2 and B.3 for the instructions provided to the videographer.

Session “Search & Rescue” depicts a simulated wilderness search and rescue. In this forward-looking scenario, bodycam videos are live streamed to the mobile command center, using the nationwide public safety broadband wireless network. A drone is used to remotely search for the lost hiker. The session includes drone footage, head mounted cameras, and handheld cameras. The simulated search and rescue was filmed on a cloudy day with light rain, resulting in an occasional raindrop on a camera lens. The lost hiker wears a red jacket, which is noted in the instructions. See Appendix B.2 and B.4 for the instructions provided to the videographer. Note that the live streaming is envisioned, not implemented.

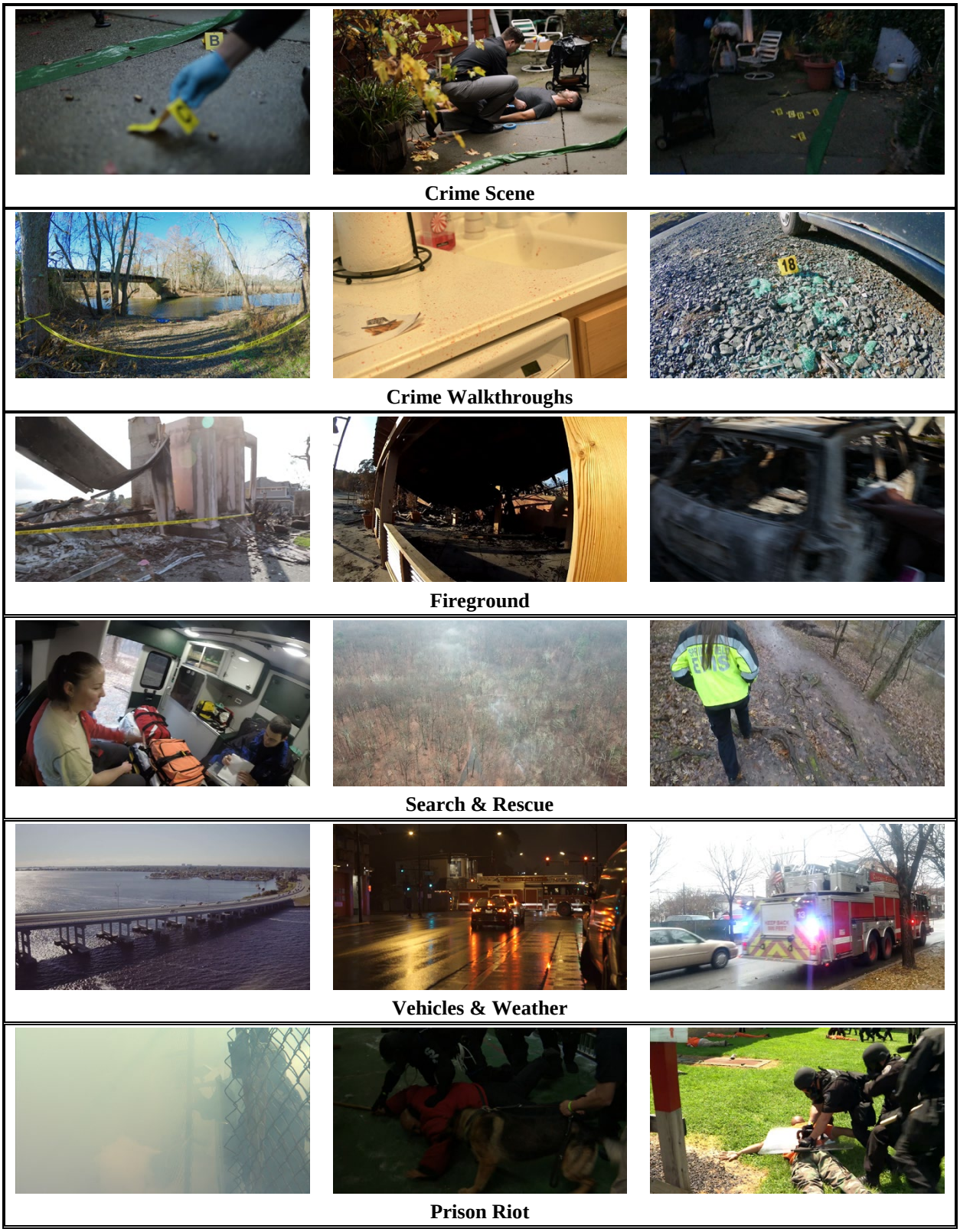

Figure 1. Sample frames from each session.

Session “Vehicles & Weather” contains a variety of outdoor city scenes. First responders operate in environments that are difficult for cameras. Surveillance systems, in-car cameras, and bodycams contend with rain, falling snow, city streets, streetlights, poor lighting, flashing lights, and fast moving cars. Subjects chose whether to evaluate the videos for real-time monitoring or video playback. The real-time option is a forward-looking scenario where bodycams, in-car cameras, and surveillance videos are live streamed to practitioners, using the nationwide public safety broadband wireless network. Subjects were allowed to sign up for this session twice, and evaluate the videos both ways, but no one chose to do so. Camera points-of-view include drone, surveillance camera, handheld camera, and dash camera in a moving vehicle. See Appendix B.2, B.4, and B.5 for the instructions provided to the videographer. The scenes portrayed have no clear object(s) of interest, and so are less realistic than is desirable. This may have made it more difficult for first responders to judge the quality of the videos for their tasks.

Session “Prison Riot” depicts the 2010 Mock Prison Riots. This tactical training event for law enforcement and corrections is held at the decommissioned West Virginia Penitentiary in Moundsville, WV. In 2010, ITS obtained permission to attend and film portions of the event. The subjects chose whether to evaluate the videos for real-time monitoring or video playback. The real-time option is a forward-looking scenario where bodycams and surveillance videos are live streamed to the command center, using the nationwide public safety broadband wireless network. The video cameras are mounted to capture the same general direction as the body is facing (i.e., generally forward). Subjects were allowed to sign up for this session twice, and evaluate the videos both ways, but no one chose to do so. The Prison Riot session differs from the other five sessions, in that an experienced videographer was trying to obtain optimal performance from a professional camera (i.e., using videography techniques suitable for recording action shots for news programs). The footage demonstrates problems that modern cameras have in difficult environments, despite the best efforts of the videographer.

2.2 Processing Chain

The processing chain consisted of four steps: filming, session selection, editing, and resizing.

Filming

The design of **its4s3** began in the fall of 2017, when ITS commissioned video footage according to the acquisition procedure and specifications listed in Appendix B. This footage adds to a body of ITS footage from prior public safety projects. The goal of the current filming was to obtain footage that:

- Simulates how first responders use video
- Depicts subject matter frequently encountered by first responders
- Can be redistributed for research and development purposes
- Demonstrates the range of quality responses from modern cameras
- Includes both amateur and professional videography
- Depicts situations and environments that may challenge cameras
- Contains a variety of different camera types (e.g., bodycam, in-car, drone, handheld)
- Explores camera technology gaps identified by first responders in [3]

Some videographers delivered the raw footage that was recorded by the camera. Other videographers delivered edited footage, extracting sequences of interest. Collectively, the delivered footage is used as described below to construct the six sessions described above.

Session Selection

The session selection process was limited by content availability (i.e., the six session scenarios were chosen to fit the available footage). Within that constraint, sessions were selected to exercise the filming variables (e.g., camera, videography technique, environment) and to present an interesting variety of use cases at the 2018 PSCR Public Safety Broadband Stakeholder Meeting. See Section 2.1 for the final list of session scenarios.

Generally speaking, first responders use video in two ways: playback and real-time. The video system requirements differ. When video is recorded for later playback, the video system requirements include letting people see what actually occurred, providing an unbiased account of events, creating evidence, and reviewing and critiquing dangerous situation response for training purposes. When video is viewed in real-time, the video system requirements include letting people view remote locations using mobile cameras or fixed cameras, controlling unmanned aerial vehicles (UAV), controlling unmanned ground vehicles (UGV), providing situational awareness, and making real-time mission-critical decisions.

Each session scenario was associated with video playback, real-time video streaming, or both. The Crime Scene, Crime Walkthroughs, and Fireground sessions were associated with video playback only. The Search & Rescue session was associated with real-time video only.

For the Prison Riot and Vehicles & Weather sessions, subjects chose either playback or real-time. Their instructions differed, depending upon this choice. The clips in these two sessions may reasonably be used both ways, and the subject matter includes situations that may showcase differences between these two broad use cases. As an example, the smoke in some of the Prison Riot scenes may be desirable (e.g., by correctly reflecting the situation) or undesirable (e.g., blocks visibility).

Editing

After the session themes were selected, 99 video clips were edited from the footage available for each session. Clips were selected with the intention of characterizing the raw footage and maximizing visual variety (e.g., setting, video quality, camera type, video format, visual impairment, videographer behavior). Most of the clips are 4 seconds in duration, in keeping with the philosophy of experiment **its4s** [1]. A few of the Prison Riot clips are 4.5 seconds, because a longer duration was necessary to view the action and how the camera responded to that action and environment. In some cases, this was a purely aesthetic choice (e.g., between displaying an entire event or cutting the sequence mid-event).

With the following two exceptions, the original format was retained during the editing. First, the 4K content (3840 × 2160) was down-sampled to 1080p resolution (1920 × 1080). The editing computer had difficulty playing professional 4K footage, so down-sampling was necessary to ensure the content was correctly edited. Second, interlaced 1080i 29.97 fps content was de-

interlaced by interpolation to produce 1080p 59.94 fps content. See Appendix C for details on each clip (e.g., resolution, frame rate, footage source).

The edited video clips are referred to as the "original resolution." These clips were saved as 16 Mbps MP4 files. This bit-rate is low enough to ensure perfect playback from a solid state drive, yet high enough to minimize quality degradations due to transcoding artifacts. A few clips edited from lower quality cameras were saved at 10 Mbps, due to quirks of the editing software. These sequences were not re-edited, as the transcoding did not further impair the video.

Resizing

The original resolution clips were then resized to fit the test laptop's display size, 1920 × 1080. Each clip was resized (up-sampled or down-sampled) as if the viewer was watching the video full screen. If the original footage did not have a 16:9 aspect ratio, then black was added to the top and bottom or to the left and right. Some of the original footage included a black border, which was removed manually. A small border of black pixels may remain.

The rescaled 1920 × 1080 clip was saved to a new file with the same file name, typically at 16 Mbps. In a few cases, the editing software imposed a 10 or 14 Mbps upper limit on that file's bitrate. These video files, referred to as the "viewed resolution," were played by the subjective test software for people to rate.

2.3 Scenes, Impairments, and Naming Convention

Each edited video sequence is named according to the following naming convention:

its4s3_*session-camera-number_impairment*

Where

- *session* is a session abbreviation from Table 1
- *camera* is a camera category from Table 2
- *number* is a two digit number, 01 through 99
- *impairment* is the impairment category from Table 3

The *camera* designation captures both the type of camera and how the camera is operated. These rough categorizations were chosen during editing, by watching the footage (i.e., the videographers did not record how each camera was operated). The *impairment* designation roughly categorizes the videos by a prominent visual characteristic, which may be good or bad. The *impairment* designation can be incomplete when a video contains multiple impairments.

Table 1. File Name Convention: Session Abbreviation and Session Name

Session Abbreviation	Session Name
cs	Crime Scene
cw	Crime Walkthroughs
fg	Fireground
pr	Prison Riot
sr	Search & Rescue
vw	Vehicles & Weather

Table 2. File Name Convention: Camera Category

Camera	Description
held	Handheld camera with limited movement; point-of-view (POV) of a stationary person or vehicle
pan	Camera pans in any direction (side, down, etc.), handheld or tripod mount
zoom	Camera zoom, tripod
drive	POV of a vehicle, typically moving forward; windshield in front of a handheld or mounted camera
walk	POV of a moving person, as per handheld camera or bodycam; body motion plus handheld jiggle
helmet	POV of a helmet camera
twist	Complex movements, like POV side window of moving car passing another car, or a camera that rotates while the videographer walks
drone	Drone footage

Table 3. File Name Convention: Impairment Category

Impairment	Description
aspect	Aspect ratio other than 16:9
blur	Blurry, poor focus, motion blur
codec	Encoder artifacts are obvious (e.g., blocking, skipped frames, glitch blurs frames)
color	Color problems (e.g., all colors wrong, different light corrupts colors in part of image)
contrast	Too dark, too light, deep shadows or white clipping that limit or prevent visibility; everything similar shade
dof	Narrow depth of field, with blurry areas that should be in focus
fisheye	Fisheye lens and other lens distortions
focus	Change of focus, and autofocus adjustment
grime	Grime or water drops on lens, windshield, or window; thumb in front of lens
lensflare	Lens flare

Impairment	Description
light	Very bright light included in scene (e.g., sun viewed directly, flashlight in low lighting, flashing vehicle lights, camera flash)
monitor	Scene includes a monitor (e.g., laptop, smartphone) that may be difficult to read
motion	Interesting or erratic motion, inadequate frame rate, jerky motion, too-close object moving quickly
noise	Analog noise, typically from low light levels
object	Scene includes a focal object, which may be difficult to perceive (e.g., small, similar color, poor framing, camera upside down) or easy to perceive (e.g., clear hand gesture)
obscurant	Airborne obscurants (e.g., fog, rain, snow, dust); reflections on glass
temporal	Order of events may matter, impairment levels change over time (e.g., fast pan, cloud passes in front of sun)
texture	Interesting texture (e.g., white spots on black); includes high quality videos
vanish	Object of interest vanishes (when it shouldn't)

3. SUBJECTIVE TESTING, POST PROCESSING, AND MOS ANALYSIS

3.1 Subjective Testing

Pilot testing was conducted using five U.S. Department of Commerce employees, four of whom were unfamiliar with the project. All pilot testers had some knowledge of first responder tasks and needs. The **its4s3** pilot subjects requested accommodation in the software interface, for cases when they were briefly distracted and did not see a video. All of the pilot testers asked questions about how to rate quality of the videos. In response to the pilot testing feedback, two laptops were replaced with a newer laptop, the screen lock time was extended to 1 hour, the rating scale was modified, a training video was created, and the instructions were updated to include the scenario description and camera system requirements. Details on the latter three changes follow.

The **its4s3** experiment was conducted according to ITU-T Rec. P.913. The rating scale was a modified version of the absolute category rating (ACR) scale. In addition to the standard rating levels—excellent, good, fair, poor, and bad—subjects were offered a "skip" option. The skip option is intended to be used when the subject did not see the video. The "skip" option was also used in experiment **its4s**. The skip option was not abused and seemed to only be used when the subject was inattentive (see "human error" in [1]).

Subjects were given instructions on the use of the ACR scale that focused their attention on the first responder use case. The instructions included the following elements:

- A brief description of the session's scenario
- Video system requirements for that scenario
- Tips on how to rate clips
- Task dependent definitions for "excellent" and "bad"

The intention was to more closely tie the ACR quality scale to a first responder's need to feel confident when relying on videos for job related activities. Excellent was described as inspiring confidence (e.g., "You feel confident making real-time mission critical decisions" or "You feel confident relying on the recording to understand what occurred"). Bad was described as, "You are reluctant to rely on the recording." See Appendix D for the instructions, which were tailored to each session.

To accommodate a fast turnaround of subjects within a busy meeting, subjects were given printed instructions. Some subjects ignored the instructions or skimmed them quickly.

The subjective testing was conducted on laptops with 1920 × 1080 monitors. Each laptop screen was 6" vertically, 11" horizontally, and 12.5" diagonally. Subjects self-selected a comfortable viewing distance of roughly 3 to 4 picture heights (no measurements were taken). Six of the laptops had touchscreens and could fold into a tablet configuration. Subjects using those laptops were offered styluses. The subjective test was controlled by the AVRateNG software [4],[5].

The experiment did not have a training session, due to time and logistical constraints around gathering subjective data at a busy meeting. Some subjects viewed a two minute video sequence of content that did not appear in the test. This "training video" was played on a projection screen during one of the meeting's sessions, before the testing began. The venue was divided into multiple tracks, so most subjects did not see the training video. The lack of a training session may add noise to the data (i.e., increase standard deviation of scores).

The optional "training video" showed a variety of different camera responses, including odd camera angle, sky clipped white, fisheye lens, noise from low light conditions, light and heavy rain on a windshield, streetlights reflecting off rain on a windshield, lens flare, fog, falling snow, jerky zoom, white balance change, jerky pan and zoom, irregular movement from a body worn camera, motion blur, movements faster than the frame rate can reproduce smoothly, smoke, and flashes of light. Most of the content was filmed from a moving car; the remainder was from a handheld or body-worn camera. This footage was purchased for internal use only and cannot be redistributed by ITS.

Figure 2 shows the room where the testing was conducted. Most of the subjective testing was conducted at the back of a room set aside as a break room for the 2018 PSCR Stakeholder Meeting staff. A mobile divider (not shown) separated the two areas. The rest of the subjective testing was conducted in the main presentation room, during an extended break for lunch. Occasional discussion occurred, but the rooms were quiet most of the time.

Figure 2. Subjective testing at 2018 Stakeholder Meeting was mostly conducted at the back of a room set aside for staff breaks (top left and bottom). A few subjects took the test in the main presentation room, during a lunch break (top right).

Each session was installed on a different laptop. The instructions for that session were placed adjacent to the laptop (see Appendix D). Subjects chose a session that interested them.

After completing a session, subjects filled out a short questionnaire to gather demographic information and feedback. Visual acuity was self-assessed on the ACR scale; age was collected by decade; and occupation was limited to whether the subject was a first responder. The occupation question includes some misleading responses. In particular, some retired first responders marked that they were not first responders. The questionnaire included an option to supply miscellaneous other feedback. The ratings, demographic information, and feedback are available with the dataset on CDVL. Subjects were thanked for their assistance with a $10 gift certificate and a stylus pen engraved with the ITS logo.

3.2 Analysis of 2018 Stakeholder Meeting Subject Data

Table 4 and Figure 3 show the distribution of mean opinion scores (MOS) for each session, presented as normalized frequency histograms in the figure. A total of 92 sessions were completed, and each session produced 99 votes. Recall that each session had different subjects. The Crime Scene session has the most even distribution of MOSs. The other sessions have narrow ranges of MOSs. Figure 4 and Table 5 show the Pearson correlation between each subject's opinion ratings and the MOSs (across all subjects) for that session. This is referred to as subject correlations. In Table 5, ID refers to the subject's identification number, and ρ refers to Pearson correlation.

The subject correlations for Crime Walkthroughs are noticeably lower than for Fireground. This cannot be statistically explained by the narrow range of MOSs, since both have a narrow range of MOSs. The Crime Walkthroughs ratings could reflect some genuine differences among subjects in their rating behaviors. That is, this session may help us understand whether first responders use different criteria to judge the quality of video sequences for first responder applications.

Table 4. Range of MOSs, By Session

Session	Average MOS	Standard Deviation of MOSs
Crime Scene	2.90	0.93
Crime Walkthroughs	3.40	0.64
Fireground	3.10	0.70
Mock Prison Riots	3.41	0.64
Search & Rescue	3.30	0.74
Vehicles & Weather	3.33	0.68

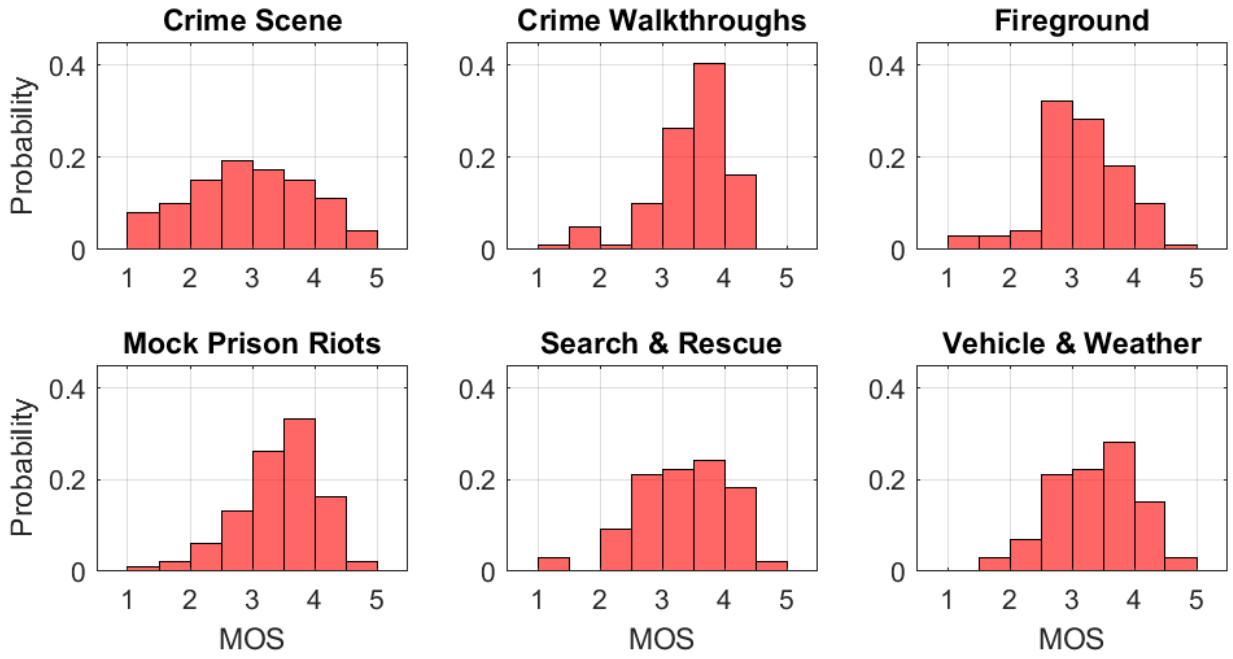

Figure 3. Histograms show the distribution of MOSs for each session.

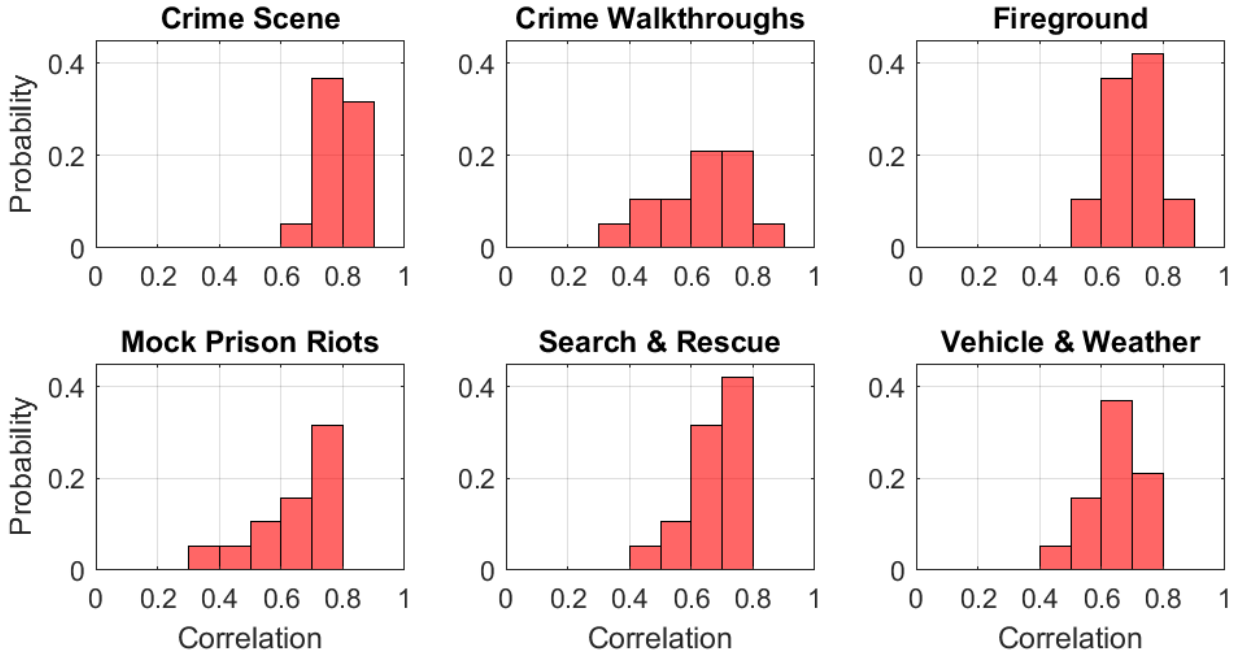

Figure 4. Histograms show the distribution of Pearson correlations between the session MOSs and each subject's ratings.

Table 5. Pearson Correlations Between Session MOSs and Subject Ratings

Crime Scene		**Crime Walkthroughs**		**Fireground**		**Mock Prison Riot**		**Search & Rescue**		**Vehicles & Weather**	
ID	ρ	ID	ρ	ID	ρ	ID	ρ	ID	ρ	ID	ρ
cs-01	0.75	cw-01	0.38	fg-01	0.70	pr-01	0.53	sr-01	0.80	vw-01	0.66
cs-02	0.79	cw-02	0.80	fg-02	0.57	pr-02	0.49	sr-02	0.67	vw-02	0.71
cs-03	0.81	cw-03	0.69	fg-03	0.80	pr-03	0.71	sr-03	0.74	vw-03	0.77
cs-04	0.66	cw-04	0.73	fg-04	0.62	pr-04	0.74	sr-04	0.80	vw-04	0.59
cs-05	0.77	cw-05	0.68	fg-05	0.76	pr-05	0.63	sr-05	0.54	vw-05	0.60
cs-06	0.81	cw-06	0.62	fg-06	0.70	pr-06	0.71	sr-06	0.66	vw-06	0.66
cs-07	0.85	cw-07	0.79	fg-07	0.69	pr-07	0.63	sr-07	0.66	vw-07	0.53
cs-08	0.74	cw-08	0.47	fg-08	0.69	pr-08	0.72	sr-08	0.72	vw-08	0.75
cs-09	0.89	cw-09	0.81	fg-09	0.79	pr-09	0.72	sr-09	0.65	vw-09	0.66
cs-10	0.85	cw-10	0.58	fg-10	0.78	pr-10	0.58	sr-10	0.77	vw-10	0.63
cs-11	0.73	cw-11	0.75	fg-11	0.70	pr-11	0.36	sr-11	0.70	vw-11	0.69
cs-12	0.86	cw-12	0.69	fg-12	0.63	pr-12	0.72	sr-12	0.75	vw-12	0.47
cs-13	0.78	cw-13	0.55	fg-13	0.57	pr-13	0.63	sr-13	0.59	vw-13	0.51
cs-14	0.77	cw-14	0.50	fg-14	0.74			sr-14	0.61	vw-14	0.65
				fg-15	0.74			sr-15	0.62	vw-15	0.79
				fg-16	0.83			sr-16	0.71		
				fg-17	0.75			sr-17	0.41		
				fg-18	0.63						
				fg-19	0.77						

Figure 5 plots MOS versus SOS, after removing the overall bias from each subject's data, as recommended by Janowski and Pinson [6]. That is, we subtract from each opinion score the difference between a subject's average score and the average of all lab subject scores. Note that this typically reduces SOS but does not impact MOS values.

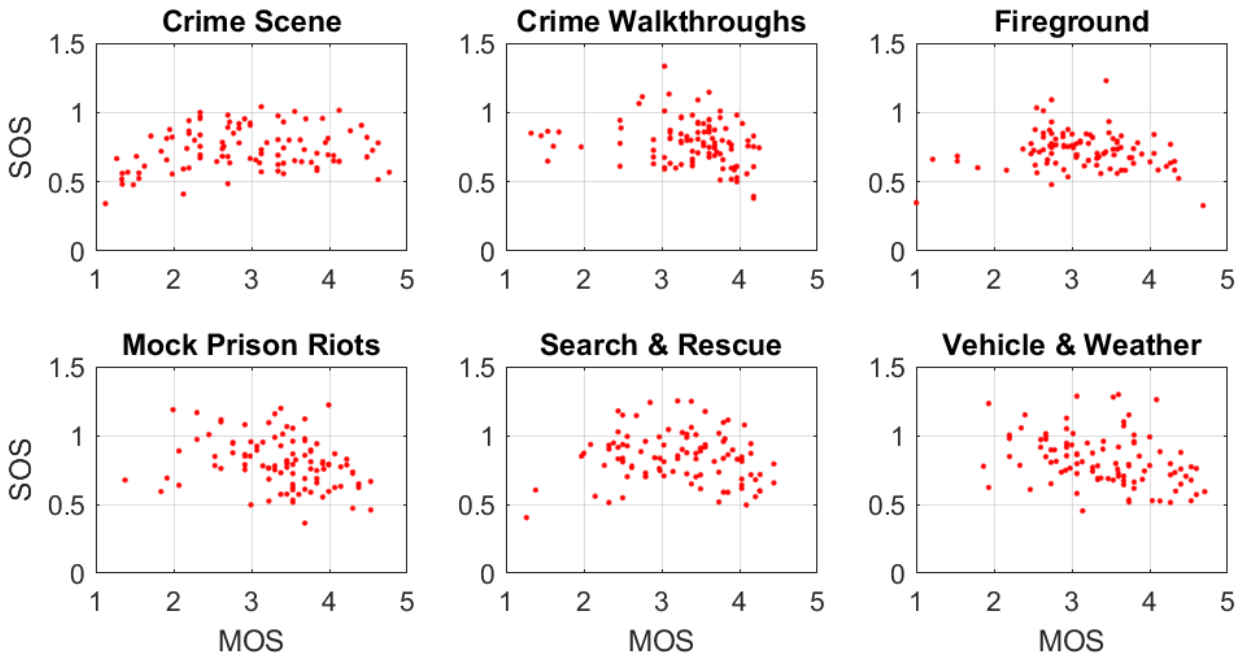

Figure 5. MOS versus SOS, computed after overall bias was removed from each subject's scores. This typically reduces SOS but does not impact MOS values.

3.3 Skip Option

Recall that subjects were asked to select "skip" if they did not see a video. Table 6 shows how often subjects used this rating option—68% of subjects (63 out of 92) never used the "skip" rating level. The subject who selected "skip" most often used this option for 10% of the data (10 out of 99 votes). 97% of subjects (89 out of 92) used the "skip" option for 5% or less of the data (5 or fewer out of 99 votes).

In the **its4s** test, by contrast, 33% of subjects never used the skip option, and the subject who selected "skip" most often used this option for 2.3% of the data. An obvious difference is that its4s was conducted in a controlled laboratory environment, while **its4s3** was conducted at a busy meeting venue. Even though the room was fairly quiet, the venue was intrinsically distracting. Further research is needed on the "skip" option.

Table 6. "Skip" Rating Level

Times Used	0	1	2	3	4	5	6	7	8	9	10
# Subjects	63	9	5	7	2	3	1	1	0	0	1

3.4 Real-time vs Playback

There is insufficient data from the 2018 PSCR Stakeholder Meeting to determine whether subjects rate differently in response to real-time and playback application instructions.

4. DATASET DISTRIBUTION

The **its4s3** dataset is available on the Consumer Digital Video Library (CDVL, www.cdvl.org) for research and development purposes. CDVL provides:

- The 4 second videos, as originally edited
- The 4 second videos, as viewed and rated by the subjects
- Subjective ratings (comma separated value (CSV) file)
- Demographic information (CSV file)

The **its4s3** dataset is intended specifically to inspire innovative NR metric development around camera capture and public safety applications. The experiment design emphasizes a large variety of unrepeated content and camera capture impairments.

5. REFERENCES

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APPENDIX A INFORMED CONSENT FORM

The Institute for Telecommunication Sciences (ITS) is conducting a subjective video quality experiment. The results of this experiment will help us understand how first responders perceive the quality of video during playback and real-time video streaming.

You have volunteered to be part of this subjective video quality experiment. In this experiment, we ask you to evaluate the quality of a set of videos. Professional videographers filmed this footage for our research, based on ITS specifications. The footage demonstrates various responses from consumer cameras and professional cameras to the difficult environments that first responders encounter.

Each subject will sit on a comfortable chair watch 4 second videos on a laptop. Subjects will specify their opinion of the video quality. The participants of this experiment are not expected to experience any risk or discomfort. This experiment conforms to ITU-T Recommendation P.913 "Methods for the subjective assessment of video quality, audio quality and audiovisual quality of internet video and distribution quality television in any environment."

This experiment is divided into 6 sessions:

Name	Description
Crime Scene	Simulated death investigation at dusk, filmed with a variety of handheld cameras
Crime Walkthroughs	Four simulated death investigations with decedents
Fireground	Aftermath of a neighborhood fire, filmed with bodycams and handheld cameras
Search & Rescue	Wilderness search and rescue, filmed with drones, bodycams and handheld cameras
Vehicles & Weather	Interactions between rain, falling snow, in-car cameras, handheld cameras, city streets, streetlights and flashing lights
Prison Riot	Tactical training for law enforcement and corrections

Each session focuses on either video playback or real-time video streaming. During real-time sessions, subjects will imagine that first responders are monitoring a situation remotely and making real-time decisions. During playback sessions, subjects will imagine that the video must provide an unbiased account of events that lets people see what actually happened. This mindset will help us understand how cameras should respond differently to these two different applications—and to demonstrate these differences visually to researchers and developers.

You will be asked to participate in one session. Your participation is expected to be 20 min, including receiving instruction, rating videos, and answering a short questionnaire. You may at your discretion participate in another session on a different laptop.

This experiment will take place June 5 to 8, 2018, at the 2018 PSCR Public Safety Broadband Stakeholder Meeting. It will involve no more than 250 people. The identities of subjects will be kept confidential. Your ratings and feedback will be identified by a number.

Participation in this experiment is entirely voluntary. Refusal to participate will involve no penalty, and you may discontinue participation at any time. If you have any questions about research subjects' rights, or in the event of a research-related injury to the subject, please contact

Lilli Segre at (303) 497-3572. If you have any questions about this experiment or our video quality research, please contact Margaret Pinson at (303) 497-3579 or email address mpinson@ntia.gov. Subjects will be thanked for your participation with a $10 gift certificate and a stylus pen. Federal employees cannot receive the gift certificate.

Please sign the following page to indicate that you have read the above information and consent to participate in this video quality experiment.

APPENDIX B 2018 FOOTAGE ACQUISITION DETAILS

Actual first responder photographs and videos typically cannot be publicly redistributed due to litigation and privacy concerns. Therefore, ITS commissioned footage that simulates the sort of scenarios and quality problems encountered by first responders. Most of the footage in experiment **its4s3** was commissioned by ITS in 2017, using the process described in this appendix. The Prison Riot session contains footage filmed by ITS in 2010. All of the **its4s3** video sequences are from simulated public safety events.

This appendix contains the footage acquisition plan and the instructions given to videographers.

B.1 Footage Acquisition Plan

From an experiment design standpoint, there are simply too many variables. We could not fully specify the video content needed to develop NR metrics that characterize modern camera performance on the multitude of public safety scenarios. We do not know which variables will be most important. Thus, we were better off obtaining footage from a large variety of random sources. This adheres to the principles that computer scientists use to develop randomized algorithms:

> "A randomized strategy is typically used when there are many ways in which an algorithm can proceed but it is difficult to determine a way that is guaranteed to be good. If many of the alternatives are good, simply choosing one randomly can yield a good strategy. Often, an algorithm must make many choices during the execution. If the benefits of good choices outweigh the cost of bad choices, a random selection of good and bad choices can yield an efficient algorithm."
>
> *Introduction to Algorithms*, by Thomas H. Cormen, Charles E. Leiserson, and Ronald L. Rivest, page 162.

In a nutshell, the footage acquisition plan was to describe our project to a variety of different videographers and have each vendor implement these filming needs independently. Their random choices and geographic distribution around the US ensure a robust variety.

It is critical that we obtain a large variety of different people's insights into variants of each event. This includes camera type, camera placement, the actions of the people depicted, type of people depicted (e.g., skin tones, gait, accent when speaking, clothing, gender, age, height), the light sources (e.g., full sun, shade, fluorescent, sulfur streetlights), the area (e.g., place filmed, objects scattered about), actions of the videographer during filming, geographic location, and etc.

We have in the past commissioned large filming projects. The results were unsatisfactory. No matter how skilled the vendor, the footage was too uniform. We have also filmed our own content. These results were expensive and unsatisfactory. Professional videographers are better able to quickly and effectively produce video recordings that meet our needs.

We advertised to a large number of videographers. This appendix contains the information we provided to videographers. Section B.2 contains general guidance. Sections B.3 through B.6 describe the four different types of content that we requested. These four scenarios draw upon the information provided by first responders (see [3]). These particular scenarios were chosen in part as suitable topics for professional videographers working with a limited budget. Other priorities were to obtain

- Content similar to that used by first responders
- A wide variety of common camera impairments
- A wide range of video quality, good to bad
- Footage from many different types of cameras
- Footage that can be shared among researchers

Some videographers responded to one request, while others combined two requests. Based on the responses, we created and prioritized a set of micro-purchases. Each micro-purchase required some discussion and negotiation with that vendor (e.g., what they would film, their schedule). The videographers were given full creative control of these small budget filming projects.

The **its4s3** experiment uses footage from six of the ten resulting micro-purchases.

B.2 General Guidance

We need footage from a variety of vendors to help us more realistically represent the many different situations encountered by first responders across the United States. We will accept bids from several different vendors in response to this video request. Our budget for each vendor is limited to $3,500. All purchases must be paid with credit cards.

NTIA must have rights to use the footage internally and to freely redistribute the footage for research and development purposes. These usage rights must include redistribution on the Consumer Digital Video Library (CDVL, https://www.cdvl.org/). For CDVL license terms, register for a free account, and then select “Find Videos.” A license clarification in plain English is available at https://www.its.bldrdoc.gov/resources/video-quality-research/video-footage.aspx We do not need commercial rights to the footage. The copyright holder may retain commercial rights to the footage. If new content is filmed, participants may be given copies of the footage for their purposes.

We do not want footage that raises privacy concerns.

We prefer to receive the raw footage from the camera, where possible. If the budget permits, we would like videographer to extract 4 second clips from their footage. Considered together, these 4 second clips should show the variety of subject matter in the footage, including anything the videographer finds interesting and any undesirable camera behaviors. The 4 second video clips

should span the full range of visual quality present in the footage (good to bad). This editing is optional.

B.3 Natural or Man-made Disasters

We need footage depicting natural or man-made disasters. The footage may depict either the incident or the response afterward. Footage may depict simulated incidents, such as a controlled building demolition or a controlled burn of invasive plants. Basically, we need footage that depicts the challenging environments that first responders encounter during disaster response. This footage will be freely distributed for research and development purposes, to encourage new cameras that better serve public safety needs.

We need diverse footage that shows how first responders use video and the range of video quality they can expect to receive in the future (e.g., in 10 years). We need the excellent quality video from professional cameras operated by professional videographers. However, most first responders aren't trained videographers. Thus, we also need footage that depicts typical video quality problems that result from non-experts using automatic cameras. Examples include poor focus, backlit subjects, camera jiggle, uneven lighting, and analog noise from low light filming.

We expect offers of existing footage that was filmed for previous projects. If new footage is to be filmed, we don't want you to do anything that would put your life or safety at risk.

We want footage from professional cameras. Progressive is preferred (720p, 1080p, or 4K) with frame rates from 24fps to 120fps. Preferably, recording bitrates should be suitable for broadcast applications.

B.4 Drone Footage of Public Safety Events

We need footage from drones depicting public safety events. For example, drones can be used to aid search and rescue (urban or wilderness), fire response, hazardous material response (hazmat), or bomb disposal. The footage may depict actual incidents, training events, or simulated incidents. Basically, we need footage that depicts the sort of drone footage that first responders will see when using drones during incident response. This footage will be freely distributed for research and development purposes, to encourage new cameras that better serve public safety needs.

New filming projects will require advice, assistance and/or cooperation from first responders. For example, the videographer may arrange to film a search and rescue training event. First responders may be referred to us, for information on this project and the intended use of the footage.

We need diverse footage that shows how first responders use drones today and the range of video quality they can expect to receive in the future (e.g., in 10 years). We need the excellent quality video that results when professional videographers operate professional drones. However, most first responders aren't trained videographers. Thus, we also need footage depicting the various video quality problems that can result when non-experts use drones.

We want footage from drones that have professional image quality and performance.

B.5 Inclement Weather

We need footage depicting inclement weather, such as rain, falling snow, airborne dust, fog, high wind, tornado, or hurricane. The footage should have the appearance of footage that a first responder might receive from a video surveillance system, handheld camera, bodycam, dash cam, drone or helicopter camera. We need footage collected during a variety of different lighting conditions (e.g., full sun, partial shade, sunrise or sunset, at night with various types of streetlights).

Other than the inclement weather, the footage may depict ordinary events. Basically, we need to simulate the footage that responder devices record during inclement weather, but with higher quality cameras. This footage will help us understand the unusual shapes, movements, objects, and events that occur during these unusual weather environments. This footage will be freely distributed for research and development purposes, to encourage new cameras that better serve public safety needs.

In particular, we seek a better understanding of the problems that video coders have when recording or transmitting low bitrate video streams during inclement weather. Thus, we need the excellent quality video from professional cameras operated by professional videographers (e.g., camera on a tripod, locked down). However, we also need footage that is complicated by various lighting conditions (e.g., night, sunset, day) or more challenging camera movements. Examples include a camera mounted on the dashboard of a moving car, or a camera that jiggles and moves erratically as per a bodycam worn by a moving person—provided that can be done safely. We don’t want you to do anything that would put your life or safety at risk.

We want footage from professional cameras. Progressive is preferred (720p, 1080p, or 4K) with frame rates from 24fps to 120fps. Preferably, recording bitrates should be suitable for broadcast applications.

B.6 Simulated Crime Scene Walkthroughs

When law enforcement responds to a major event, such as an officer involved shooting, there are contesting issues. Lots of investigators need to understand the crime scene, but it is important to limit foot traffic through the crime scene. Video walkthroughs provide a solution. The goals are to show how the scene existed at the time; to help people understand dimensions, the layout, and relative positions of objects; and to aid later personnel deployments (e.g., medical). We cannot use real video walkthroughs, due to litigation concerns.

We need footage that simulates an officer filming a video walkthrough of a crime scene, while describing the situation verbally. The crime scene does not need to depict a major event. This footage will be freely distributed for research and development purposes, to encourage new cameras that better serve public safety needs.

The assistance of a law enforcement officer or trainer will be important for this filming. Their expertise is important to promote realism in the crime scene and commentary. Law enforcement officers may be referred to us, for information on this project and the intended use of the footage.

We need the excellent quality video of a professional camera operated by a professional videographer. However, most first responders aren't trained videographers. Thus, we also want the footage to include typical video quality problems that result from non-experts using automatic cameras. Examples include backlit subjects, uneven lighting, and analog noise from low light filming.

We want footage from professional cameras. Progressive is preferred (720p, 1080p, or 4K) with frame rates from 24fps to 120fps. Preferably, recording bitrates should be suitable for broadcast applications. In addition to this professional recording, we want each simulated crime scene walkthrough to be filmed with one or more consumer grade cameras, including a phone camera. Professional lighting should typically not be used when filming with these consumer grade cameras. We are also interested in footage from drones.

APPENDIX C VIDEO SEQUENCE RESOLUTION, FRAME RATE, AND SOURCE

Tables C-1 through C-6 contains details for the 99 video sequences in each session. For each clip, these tables identify the videographer who filmed the footage, the original resolution, any format conversion performed prior to editing, the frame rate, and the name of the original file.

Table C-1. Original Format Information For Crime Scene Clips

File	Videographer	Resolution	FPS	Raw File
its4s3_cs-fixed-01_dof	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9763
its4s3_cs-fixed-02_dof	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9764
its4s3_cs-held-03_dof	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9765
its4s3_cs-held-04_dof	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9766
its4s3_cs-held-05_dof	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9766
its4s3_cs-held-06_focus	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9766_1
its4s3_cs-held-07_dof	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9766_1
its4s3_cs-down-08_motion	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9767
its4s3_cs-pan-09_motion	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9767
its4s3_cs-held-10_focus	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9767
its4s3_cs-pan-11_motion	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9767
its4s3_cs-fixed-12_blur	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9769
its4s3_cs-fixed-13_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9771
its4s3_cs-fixed-14_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9771
its4s3_cs-held-15_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9772
its4s3_cs-pan-16_blur	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9772
its4s3_cs-held-17_focus	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9772
its4s3_cs-pan-18_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9773
its4s3_cs-twist-19_blur	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9774

File	Videographer	Resolution	FPS	Raw File
its4s3_cs-twist-20_focus	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9774
its4s3_cs-twist-21_blur	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9774
its4s3_cs-pan-22_blur	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9774
its4s3_cs-walk-23_blur	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9775
its4s3_cs-pan-24_blur	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9775
its4s3_cs-twist-25_blur	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9775
its4s3_cs-walk-26_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-pan-27_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-pan-28_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-pan-29_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-walk-30_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-walk-31_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-held-32_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-twist-33_contrast	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-pan-34_motion	Branded Content Media	720 × 480p	30	Crime Scene, 3T8A9776
its4s3_cs-walk-35_motion	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9777
its4s3_cs-held-36_focus	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9778
its4s3_cs-held-37_object	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9778
its4s3_cs-held-38_object	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9778
its4s3_cs-held-39_codec	Branded Content Media	640 × 480p	15	Crime Scene, 3T8A9780.3gp
its4s3_cs-held-40_focus	Branded Content Media	640 × 480p	15	Crime Scene, 3T8A9780.3gp
its4s3_cs-held-41_motion	Branded Content Media	640 × 480p	15	Crime Scene, 3T8A9780.3gp
its4s3_cs-held-42_blur	Branded Content Media	640 × 480p	15	Crime Scene, 3T8A9780.3gp

File	Videographer	Resolution	FPS	Raw File
its4s3_cs-held-43_vanish	Branded Content Media	640 × 480p	15	Crime Scene, 3T8A9780.3gp
its4s3_cs-held-44_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9782
its4s3_cs-held-45_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9782
its4s3_cs-held-46_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9782
its4s3_cs-held-47_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9782
its4s3_cs-held-48_motion	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9783
its4s3_cs-fixed-49_vanish	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9784
its4s3_cs-fixed-50_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9784
its4s3_cs-held-51_light	Branded Content Media	720 × 480p	60	Crime Scene, 3T8A9785
its4s3_cs-held-52_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9786
its4s3_cs-held-53_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9786
its4s3_cs-held-54_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9786
its4s3_cs-held-55_contrast	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9786
its4s3_cs-held-56_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9786
its4s3_cs-held-57_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9786
its4s3_cs-walk-58_motion	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9788
its4s3_cs-held-59_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9788
its4s3_cs-held-60_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9788
its4s3_cs-held-61_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9788
its4s3_cs-held-62_light	Branded Content Media	1920 × 1080p	60	Crime Scene, 3T8A9788
its4s3_cs-held-63_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 36 48 PM
its4s3_cs-held-64_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 36 48 PM
its4s3_cs-twist-65_noise	Branded Content Media	1920 × 1080p	30	Crime Scene, File Nov 25, 6 39 55 PM

File	Videographer	Resolution	FPS	Raw File
its4s3_cs-held-66_noise	Branded Content Media	1920 × 1080p	30	Crime Scene, File Nov 25, 6 39 55 PM
its4s3_cs-pan-67_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 42 16 PM
its4s3_cs-walk-68_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 42 16 PM
its4s3_cs-walk-69_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 43 12 PM
its4s3_cs-held-70_object	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 43 12 PM
its4s3_cs-twist-71_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 43 12 PM
its4s3_cs-walk-72_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 43 12 PM
its4s3_cs-walk-73_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 44 29 PM
its4s3_cs-twist-74_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 44 29 PM
its4s3_cs-held-75_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 44 29 PM
its4s3_cs-pan-76_noise	Branded Content Media	1920 × 1080p	30	Crime Scene, File Nov 25, 6 47 03 PM
its4s3_cs-walk-77_noise	Branded Content Media	1920 × 1080p	30	Crime Scene, File Nov 25, 6 47 03 PM
its4s3_cs-twist-78_motion	Branded Content Media	1920 × 1080p	30	Crime Scene, File Nov 25, 6 47 03 PM
its4s3_cs-twist-79_motion	Branded Content Media	1920 × 1080p	30	Crime Scene, File Nov 25, 6 47 03 PM
its4s3_cs-held-80_object	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 50 10 PM
its4s3_cs-held-81_object	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 50 10 PM
its4s3_cs-twist-82_object	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 50 10 PM
its4s3_cs-walk-83_blur	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 6 50 10 PM
its4s3_cs-pan-84_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 54 07 PM
its4s3_cs-walk-85_aspect	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-pan-86_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-pan-87_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-twist-88_blur	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM

File	Videographer	Resolution	FPS	Raw File
its4s3_cs-walk-89_contrast	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-pan-90_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-twist-91_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-twist-92_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-pan-93_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-twist-94_motion	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 7 55 11 PM
its4s3_cs-held-95_object	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 8 01 55 PM
its4s3_cs-held-96_light	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 8 01 55 PM
its4s3_cs-held-97_light	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 8 01 55 PM
its4s3_cs-held-98_contrast	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 8 01 55 PM
its4s3_cs-held-99_light	Branded Content Media	1080 × 1920p	30	Crime Scene, File Nov 25, 8 01 55 PM

Table C-2. Original Format Information For Crime Walkthroughs Session Clips

File	Videographer	Resolution	FPS	Raw File
its4s3_cw-walk-01_motion	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-02_motion	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-03_lensflare	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-04_lensflare	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-05_lensflare	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-06_fisheye	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-07_fisheye	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-08_motion	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-held-09_motion	Content Pictures	1920 × 1080p	30	Car_Scene_GOOD
its4s3_cw-walk-10_temporal	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-11_motion	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-12_temporal	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-13_object	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-held-14_object	Content Pictures	1920 × 1080p	30	Car_Scene_BAD

File	Videographer	Resolution	FPS	Raw File
its4s3_cw-walk-15_motion	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-held-16_object	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-17_temporal	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-18_contrast	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-19_contrast	Content Pictures	1920 × 1080p	30	Car_Scene_BAD
its4s3_cw-walk-20_noise	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-21_noise	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-22_temporal	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-23_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-held-24_blur	Mjordan Pictures	4K to 1920 × 1080p	24	CU Blood 02
its4s3_cw-walk-25_contrast	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-26_contrast	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-27_contrast	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-28_contrast	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-29_contrast	Content Pictures	1920 × 1080p	30	Dumpster_Scene_BAD
its4s3_cw-walk-30_fisheye	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-31_fisheye	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-32_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-33_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-34_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-35_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-36_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-37_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-38_motion	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-walk-39_noise	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-held-40_noise	Content Pictures	1920 × 1080p	30	Dumpster_Scene_GOOD
its4s3_cw-held-41_grime	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-42_motion	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-43_contrast	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-44_contrast	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-45_motion	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-46_contrast	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-47_temporal	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-48_temporal	Content Pictures	1920 × 1080p	30	River_Scene_BAD

File	Videographer	Resolution	FPS	Raw File
its4s3_cw-walk-49_contrast	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-50_temporal	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-51_temporal	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-52_temporal	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-53_motion	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-54_motion	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-pan-55_grime	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-56_grime	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-57_object	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-pan-58_object	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-held-59_motion	Content Pictures	1920 × 1080p	30	River_Scene_BAD
its4s3_cw-walk-60_motion	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-walk-61_motion	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-walk-62_lensflare	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-walk-63_lensflare	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-walk-64_motion	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-65_motion	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-66_monitor	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-67_monitor	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-68_texture	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-69_motion	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-70_color	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-walk-71_motion	Content Pictures	1920 × 1080p	30	River_Scene_GOOD
its4s3_cw-held-72_contrast	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-held-73_temporal	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-walk-74_color	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-walk-75_temporal	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-pan-76_object	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-pan-77_temporal	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-pan-78_blur	Mjordan Pictures	1920 × 1080p	30	iphone camera footage
its4s3_cw-held-79_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Shell Casing
its4s3_cw-walk-80_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Shell Casing
its4s3_cw-walk-81_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Approaching Body Avoiding Blood

File	Videographer	Resolution	FPS	Raw File
its4s3_cw-walk-82_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Approaching Body Avoiding Blood
its4s3_cw-pan-83_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Approaching Body Avoiding Blood
its4s3_cw-held-84_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Approaching Body Avoiding Blood
its4s3_cw-held-85_obscurant	Mjordan Pictures	4K to 1920 × 1080p	24	Front Door Entering Home
its4s3_cw-pan-86_temporal	Mjordan Pictures	4K to 1920 × 1080p	24	Front Door Entering Home
its4s3_cw-held-87_contrast	Mjordan Pictures	4K to 1920 × 1080p	24	Front Door Entering Home
its4s3_cw-held-88_contrast	Mjordan Pictures	4K to 1920 × 1080p	24	Front Door Entering Home
its4s3_cw-pan-89_blur	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-pan-90_blur	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-held-91_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-walk-92_codec	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-pan-93_codec	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-pan-94_motion	Mjordan Pictures	4K to 1920 × 1080p	24	CUs of Blood and Gun 01
its4s3_cw-held-95_contrast	Mjordan Pictures	4K to 1920 × 1080p	24	CUs of Blood and Gun 01
its4s3_cw-walk-96_contrast	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-held-97_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-held-98_motion	Mjordan Pictures	4K to 1920 × 1080p	24	Ext Crime Scene Walk Around Home
its4s3_cw-held-99_blur	Mjordan Pictures	4K to 1920 × 1080p	24	CU Blood 02

Table C-3. Original Format Information For Fireground Session Clips

File	Videographer	Resolution	FPS	Raw File
its4s3_fg-walk-01_motion	Branded Content Media	1920 × 1080p	24	3T8A0003
its4s3_fg-walk-02_motion	Branded Content Media	1920 × 1080p	24	3T8A0003

File	Videographer	Resolution	FPS	Raw File
its4s3_fg-walk-03_motion	Branded Content Media	1920 × 1080p	24	3T8A0003
its4s3_fg-twist-04_motion	Branded Content Media	1920 × 1080p	24	3T8A0003
its4s3_fg-pan-05_motion	Branded Content Media	1920 × 1080p	24	3T8A0003
its4s3_fg-walk-06_motion	Branded Content Media	1920 × 1080p	24	3T8A0014
its4s3_fg-walk-07_motion	Branded Content Media	1920 × 1080p	24	3T8A0014
its4s3_fg-walk-08_motion	Branded Content Media	1920 × 1080p	24	3T8A0014
its4s3_fg-walk-09_motion	Branded Content Media	1920 × 1080p	24	3T8A0014
its4s3_fg-walk-10_lensflare	Branded Content Media	1920 × 1080p	24	3T8A0014
its4s3_fg-held-11_blur	Branded Content Media	1920 × 1080p	24	3T8A0070
its4s3_fg-walk-12_blur	Branded Content Media	1920 × 1080p	24	3T8A9557
its4s3_fg-walk-13_motion	Branded Content Media	1920 × 1080p	24	3T8A9557
its4s3_fg-walk-14_motion	Branded Content Media	1920 × 1080p	24	3T8A9557
its4s3_fg-pan-15_motion	Branded Content Media	1920 × 1080p	24	3T8A9557
its4s3_fg-walk-16_motion	Branded Content Media	1920 × 1080p	24	3T8A9578
its4s3_fg-walk-17_motion	Branded Content Media	1920 × 1080p	24	3T8A9578
its4s3_fg-twist-18_motion	Branded Content Media	1920 × 1080p	24	3T8A9578
its4s3_fg-pan-19_lensflare	Branded Content Media	1920 × 1080p	24	3T8A9607
its4s3_fg-twist-20_lensflare	Branded Content Media	1920 × 1080p	24	3T8A9607
its4s3_fg-pan-21_motion	Branded Content Media	1920 × 1080p	24	3T8A9607
its4s3_fg-walk-22_contrast	Branded Content Media	1920 × 1080p	24	3T8A9607
its4s3_fg-walk-23_motion	Branded Content Media	1920 × 1080p	24	3T8A9607
its4s3_fg-walk-24_contrast	Branded Content Media	1920 × 1080p	24	3T8A9608
its4s3_fg-pan-25_lensflare	Branded Content Media	1920 × 1080p	24	3T8A9608

File	Videographer	Resolution	FPS	Raw File
its4s3_fg-pan-26_motion	Branded Content Media	1920 × 1080p	24	3T8A9608
its4s3_fg-walk-27_motion	Branded Content Media	1920 × 1080p	24	3T8A9608
its4s3_fg-walk-28_motion	Branded Content Media	1920 × 1080p	24	3T8A9608
its4s3_fg-walk-29_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-walk-30_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-walk-31_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-twist-32_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-pan-33_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-held-34_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-pan-35_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5770
its4s3_fg-pan-36_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5770
its4s3_fg-walk-37_motion	Branded Content Media	1920 × 1080p	30	GOPR5771
its4s3_fg-walk-38_motion	Branded Content Media	1920 × 1080p	30	GOPR5771
its4s3_fg-walk-39_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5771
its4s3_fg-walk-40_lensflare	Branded Content Media	1920 × 1080p	30	GOPR5771
its4s3_fg-walk-41_lensflare	Branded Content Media	1920 × 1080p	30	GOPR5771
its4s3_fg-walk-42_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5772
its4s3_fg-held-43_motion	Branded Content Media	1920 × 1080p	30	GOPR5773
its4s3_fg-walk-44_motion	Branded Content Media	1920 × 1080p	30	GOPR5774
its4s3_fg-walk-45_motion	Branded Content Media	1920 × 1080p	30	GOPR5774
its4s3_fg-pan-46_motion	Branded Content Media	1920 × 1080p	30	GOPR5774
its4s3_fg-walk-47_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5774
its4s3_fg-walk-48_lensflare	Branded Content Media	1280 × 720p	30	GOPR5775

File	Videographer	Resolution	FPS	Raw File
its4s3_fg-twist-49_lensflare	Branded Content Media	1280 × 720p	30	GOPR5775
its4s3_fg-twist-50_lensflare	Branded Content Media	1280 × 720p	30	GOPR5775
its4s3_fg-walk-51_fisheye	Branded Content Media	1280 × 720p	30	GOPR5775
its4s3_fg-walk-52_light	Branded Content Media	1280 × 720p	30	GOPR5775
its4s3_fg-walk-53_light	Branded Content Media	1280 × 720p	30	GOPR5775
its4s3_fg-walk-54_lensflare	Branded Content Media	1280 × 720p	30	GOPR5776
its4s3_fg-twist-55_motion	Branded Content Media	1280 × 720p	30	GOPR5776
its4s3_fg-held-56_contrast	Branded Content Media	1280 × 720p	30	GOPR5778
its4s3_fg-walk-57_motion	Branded Content Media	1280 × 720p	30	GOPR5779
its4s3_fg-walk-58_motion	Branded Content Media	1280 × 720p	30	GOPR5779
its4s3_fg-walk-59_fisheye	Branded Content Media	1280 × 720p	30	GOPR5781
its4s3_fg-twist-60_fisheye	Branded Content Media	1280 × 720p	30	GOPR5782
its4s3_fg-twist-61_fisheye	Branded Content Media	1280 × 720p	30	GOPR5783
its4s3_fg-walk-62_light	Branded Content Media	1280 × 720p	30	GOPR5784
its4s3_fg-walk-63_fisheye	Branded Content Media	1280 × 720p	30	GOPR5784
its4s3_fg-walk-64_motion	Branded Content Media	1280 × 720p	30	GOPR5784
its4s3_fg-twist-65_motion	Branded Content Media	1280 × 720p	30	GOPR5784
its4s3_fg-walk-66_fisheye	Branded Content Media	1280 × 720p	30	GOPR5788
its4s3_fg-pan-67_fisheye	Branded Content Media	1280 × 720p	30	GOPR5788
its4s3_fg-walk-68_texture	Branded Content Media	1280 × 720p	30	GOPR5789
its4s3_fg-walk-69_motion	Branded Content Media	1280 × 720p	30	GOPR5789
its4s3_fg-drive-70_motion	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 41 27 PM
its4s3_fg-drive-71_codec	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 41 27 PM

File	Videographer	Resolution	FPS	Raw File
its4s3_fg-drive-72_object	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 41 27 PM
its4s3_fg-drive-73_motion	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 41 27 PM
its4s3_fg-drive-74_contrast	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 43 05 PM
its4s3_fg-drive-75_motion	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 43 05 PM
its4s3_fg-drive-76_contrast	Branded Content Media	1920 × 1080p	30	Video Nov 02, 2 43 36 PM
its4s3_fg-held-77_texture	Branded Content Media	1920 × 1080p	30	Video Nov 02, 3 20 55 PM
its4s3_fg-walk-78_lensflare	Branded Content Media	1920 × 1080p	30	Video Nov 02, 3 20 55 PM
its4s3_fg-pan-79_contrast	Branded Content Media	1920 × 1080p	30	Video Nov 02, 3 20 55 PM
its4s3_fg-walk-80_lensflare	Branded Content Media	1920 × 1080p	30	Video Nov 02, 3 20 55 PM
its4s3_fg-walk-81_blur	Branded Content Media	1920 × 1080p	30	Video Nov 02, 3 30 00 PM
its4s3_fg-walk-82_motion	Branded Content Media	1920 × 1080p	30	Video Nov 02, 3 30 00 PM
its4s3_fg-walk-83_grime	Branded Content Media	1080 × 1920p	30	Video Nov 02, 3 30 58 PM
its4s3_fg-walk-84_grime	Branded Content Media	1080 × 1920p	30	Video Nov 02, 3 30 58 PM
its4s3_fg-pan-85_motion	Branded Content Media	1080 × 1920p	30	Video Nov 02, 3 31 28 PM
its4s3_fg-walk-86_motion	Branded Content Media	1080 × 1920p	30	Video Nov 02, 3 31 28 PM
its4s3_fg-twist-87_lensflare	Branded Content Media	1080 × 1920p	30	Video Nov 02, 3 31 28 PM
its4s3_fg-held-88_motion	Branded Content Media	1080 × 1920p	30	Video Nov 02, 5 57 46 PM
its4s3_fg-walk-89_blur	Branded Content Media	1080 × 1920p	30	Video Nov 02, 5 57 46 PM
its4s3_fg-walk-90_noise	Branded Content Media	1080 × 1920p	30	Video Nov 02, 6 28 10 PM
its4s3_fg-pan-91_noise	Branded Content Media	1080 × 1920p	30	Video Nov 02, 6 28 10 PM
its4s3_fg-pan-92_noise	Branded Content Media	1920 × 1080p	30	Video Nov 02, 6 28 40 PM
its4s3_fg-walk-93_noise	Branded Content Media	1920 × 1080p	30	Video Nov 02, 6 28 40 PM
its4s3_fg-walk-94_contrast	Branded Content Media	1920 × 1080p	24	3T8A9607

File	Videographer	Resolution	FPS	Raw File
its4s3_fg-walk-95_fisheye	Branded Content Media	1920 × 1080p	30	GOPR5769
its4s3_fg-walk-96_motion	Branded Content Media	1920 × 1080p	30	GOPR5771
its4s3_fg-drive-97_light	Branded Content Media	1280 × 720p	30	GOPR5786
its4s3_fg-drive-98_object	Branded Content Media	1280 × 720p	30	GOPR5786
its4s3_fg-drive-99_light	Branded Content Media	1280 × 720p	30	GOPR5786

Table C-4. Original Format Information For Prison Riot Session Clips

File	Videographer	Resolution	FPS	Raw File
its4s3_pr-fixed-01_dof	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0025RB
its4s3_pr-zoom-02_dof	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0025RB
its4s3_pr-fixed-03_noise	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0027JA
its4s3_pr-fixed-04_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0027JA
its4s3_pr-held-05_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0027JA
its4s3_pr-held-06_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0027JA
its4s3_pr-held-07_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0027JA
its4s3_pr-fixed-08_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday,0029F5
its4s3_pr-fixed-09_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday,0029F5
its4s3_pr-pan-10_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0213IL
its4s3_pr-held-11_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0030TC
its4s3_pr-held-12_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0030TC
its4s3_pr-held-13_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0030TC
its4s3_pr-held-14_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0030TC
its4s3_pr-held-15_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0033VE
its4s3_pr-held-16_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0033VE

File	Videographer	Resolution	FPS	Raw File
its4s3_pr-held-17_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0033VE
its4s3_pr-held-18_codec	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0033VE
its4s3_pr-held-19_focus	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0033VE
its4s3_pr-held-20_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0036FP
its4s3_pr-held-21_dof	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0036FP
its4s3_pr-held-22_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0036FP
its4s3_pr-held-23_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0037B5
its4s3_pr-zoom-24_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday,0037B5
its4s3_pr-held-25_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0037B5
its4s3_pr-held-26_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0043W7
its4s3_pr-held-27_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0043W7
its4s3_pr-fixed-28_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0215KG
its4s3_pr-held-29_temporal	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0043W7
its4s3_pr-walk-30_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0043W7
its4s3_pr-fixed-31_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 00469K
its4s3_pr-held-32_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0043W7
its4s3_pr-pan-33_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0043W7
its4s3_pr-pan-34_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0047CY
its4s3_pr-held-35_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0047CY
its4s3_pr-held-36_dof	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0047CY
its4s3_pr-held-37_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0048FL
its4s3_pr-fixed-38_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0261EI
its4s3_pr-pan-39_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0049JB

File	Videographer	Resolution	FPS	Raw File
its4s3_pr-fixed-40_grime	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0261EI
its4s3_pr-pan-41_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0049JB
its4s3_pr-held-42_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 0049JB
its4s3_pr-held-43_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 00262I
its4s3_pr-held-44_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 00262I
its4s3_pr-pan-45_lensflare	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Monday, 00409G
its4s3_pr-pan-46_grime	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0025YF
its4s3_pr-held-47_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 026569
its4s3_pr-fixed-48_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0025YF
its4s3_pr-held-49_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0262OU
its4s3_pr-fixed-50_grime	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0025YF
its4s3_pr-fixed-51_grime	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0025YF
its4s3_pr-walk-52_noise	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0210IX
its4s3_pr-held-53_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0027US
its4s3_pr-held-54_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0027US
its4s3_pr-pan-55_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0027US
its4s3_pr-held-56_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0027US
its4s3_pr-held-57_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0027US
its4s3_pr-fixed-58_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0030S1
its4s3_pr-zoom-59_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0030S1
its4s3_pr-walk-60_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0210IX
its4s3_pr-pan-61_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0030S1
its4s3_pr-fixed-62_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0030S1

File	Videographer	Resolution	FPS	Raw File
its4s3_pr-fixed-63_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-zoom-64_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-fixed-65_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-fixed-66_light	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-fixed-67_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-held-68_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Wednesday, 0210IX
its4s3_pr-fixed-69_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-fixed-70_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0031BF
its4s3_pr-fixed-71_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0033AB
its4s3_pr-zoom-72_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0033AB
its4s3_pr-fixed-73_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0033AB
its4s3_pr-fixed-74_dof	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0037KK
its4s3_pr-fixed-75_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0039RL
its4s3_pr-fixed-76_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0039RL
its4s3_pr-zoom-77_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0039RL
its4s3_pr-fixed-78_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0039RL
its4s3_pr-pan-79_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0041J3
its4s3_pr-pan-80_motion	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0041J3
its4s3_pr-pan-81_dof	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0041J3
its4s3_pr-held-82_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0041J3
its4s3_pr-walk-83_noise	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0043BQ
its4s3_pr-pan-84_texture	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0048SL
its4s3_pr-pan-85_blur	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7

File	Videographer	Resolution	FPS	Raw File
its4s3_pr-pan-86_blur	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-pan-87_blur	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-fixed-88_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-fixed-89_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-fixed-90_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-fixed-91_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-pan-92_blur	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-fixed-93_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-fixed-94_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 0049L7
its4s3_pr-pan-95_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 00444I
its4s3_pr-held-96_contrast	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 00444I
its4s3_pr-pan-97_object	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 00469K
its4s3_pr-fixed-98_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 00469K
its4s3_pr-fixed-99_obscurant	Fireside Productions	1920 × 1280i to 1920 × 1280p	60	Tuesday, 00469K

Table C-5. Original Format Information For Search & Rescue Session Clips

File	Videographer	Resolution	FPS	Raw File
its4s3_sr-drone-01_contrast	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-02_contrast	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-walk-03_motion	Fade In Creative	960 × 720	30	Team 2 - MP4 - 000412
its4s3_sr-drone-04_contrast	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-05_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-06_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-07_temporal	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-08_temporal	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-09_temporal	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-10_texture	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001

File	Videographer	Resolution	FPS	Raw File
its4s3_sr-drone-11_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-12_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-13_blur	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-14_temporal	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-15_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-16_contrast	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-17_obscurant	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-18_obscurant	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-twist-19_object	Fade In Creative	1920 × 1080p	30	GP030068
its4s3_sr-drone-20_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-21_grime	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-22_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-23_texture	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-24_dof	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-25_texture	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-26_texture	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-27_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-28_object	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-29_object	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-drone-30_motion	Fade In Creative	1920 × 1080p	30	DJI_MAVIC_0001
its4s3_sr-helmet-31_grime	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_sr-helmet-32_grime	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_sr-helmet-33_grime	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_sr-helmet-34_texture	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_sr-helmet-35_temporal	Fade In Creative	1920 × 1080p	30	GOPR0068
its4s3_sr-helmet-36_object	Fade In Creative	1920 × 1080p	30	GOPR0068
its4s3_sr-helmet-37_blur	Fade In Creative	1920 × 1080p	30	GOPR0068
its4s3_sr-helmet-38_blur	Fade In Creative	1920 × 1080p	30	GOPR0068
its4s3_sr-helmet-39_contrast	Fade In Creative	1920 × 1080p	30	GOPR0068
its4s3_sr-helmet-40_texture	Fade In Creative	1920 × 1080p	30	GOPR0068
its4s3_sr-helmet-41_object	Fade In Creative	1920 × 1080p	30	GOPR1003
its4s3_sr-helmet-42_motion	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-43_motion	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-44_motion	Fade In Creative	1920 × 1080p	30	GP010008

File	Videographer	Resolution	FPS	Raw File
its4s3_sr-helmet-45_motion	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-46_object	Fade In Creative	1920 × 1080p	30	GP020008
its4s3_sr-helmet-47_grime	Fade In Creative	1920 × 1080p	30	GP020068
its4s3_sr-helmet-48_lensflare	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-49_lensflare	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-50_motion	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-51_motion	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-52_object	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-53_object	Fade In Creative	1920 × 1080p	30	GP020008
its4s3_sr-helmet-54_motion	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-55_object	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-56_object	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-57_lensflare	Fade In Creative	1920 × 1080p	30	GP030008
its4s3_sr-helmet-58_object	Fade In Creative	1920 × 1080p	30	GP010008
its4s3_sr-helmet-59_texture	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-60_texture	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-61_texture	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-62_motion	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-63_obscurant	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-64_color	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-65_texture	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-helmet-66_motion	Fade In Creative	1920 × 1080p	30	GP010068
its4s3_sr-held-67_temporal	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-68_temporal	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-69_lensflare	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-walk-70_contrast	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-walk-71_contrast	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-72_contrast	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-73_contrast	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-74_contrast	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-walk-75_contrast	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-76_monitor	Fade In Creative	960 × 720	30	0001PQ
its4s3_sr-held-77_texture	Fade In Creative	960 × 720	30	0002GE
its4s3_sr-twist-78_motion	Fade In Creative	960 × 720	30	0003JM

File	Videographer	Resolution	FPS	Raw File
its4s3_sr-walk-79_motion	Fade In Creative	960 × 720	30	0005QU
its4s3_sr-walk-80_grime	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-held-81_grime	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-held-82_grime	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-pan-83_lensflare	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-pan-84_lensflare	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-held-85_contrast	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-held-86_lensflare	Fade In Creative	960 × 720	30	0007WI
its4s3_sr-walk-87_contrast	Fade In Creative	960 × 720	30	Team 2 - P2 Media, 0001DW
its4s3_sr-walk-88_grime	Fade In Creative	1920 × 1080	24	Osmo - Handheld Gimble (converted from 4K to 1080p)
its4s3_sr-walk-89_light	Fade In Creative	1920 × 1080	24	Osmo - Handheld Gimble (converted from 4K to 1080p)
its4s3_sr-walk-90_grime	Fade In Creative	1920 × 1080	24	Osmo - Handheld Gimble (converted from 4K to 1080p)
its4s3_sr-walk-91_motion	Fade In Creative	1920 × 1080	24	Osmo - Handheld Gimble (converted from 4K to 1080p)
its4s3_sr-walk-92_contrast	Fade In Creative	1920 × 1080	24	Osmo - Handheld Gimble (converted from 4K to 1080p)
its4s3_sr-walk-93_motion	Fade In Creative	1920 × 1080	24	Osmo - Handheld Gimble (converted from 4K to 1080p)
its4s3_sr-walk-94_contrast	Fade In Creative	960 × 720	30	Team 2 - P2 Media, 0001DW
its4s3_sr-walk-95_contrast	Fade In Creative	960 × 720	30	Team 2 - P2 Media, 0001DW
its4s3_sr-held-96_texture	Fade In Creative	960 × 720	30	Team 2 - MP4 - 000412
its4s3_sr-walk-97_texture	Fade In Creative	960 × 720	30	Team 2 - MP4 - 000412
its4s3_sr-walk-98_contrast	Fade In Creative	960 × 720	30	Team 2 - MP4 - 000412
its4s3_sr-walk-99_object	Fade In Creative	960 × 720	30	Team 2 - MP4 - 000412

Table C-6. Original Format Information For Vehicles & Weather Session Clips

File	Videographer	Resolution	FPS	Raw File
its4s3_vw-drive-01_lensflare	Branded Content Media	1920 × 1080p	30	Windshield Video, Video Nov 03, 6 28 24 PM
its4s3_vw-held-02_lensflare	Branded Content Media	1920 × 1080p	30	Windshield Video, Video Nov 03, 6 28 24 PM
its4s3_vw-held-03_lensflare	Branded Content Media	1920 × 1080p	30	Windshield Video, Video Nov 03, 6 28 24 PM
its4s3_vw-drive-04_lensflare	Branded Content Media	1920 × 1080p	30	Windshield Video, Video Nov 03, 6 28 24 PM
its4s3_vw-held-05_lensflare	Branded Content Media	1920 × 1080p	30	Windshield Video, Video Nov 03, 6 28 24 PM

File	Videographer	Resolution	FPS	Raw File
its4s3_vw-held-06_lensflare	Branded Content Media	1920 × 1080p	30	Windshield Video, File Nov 27, 4 44 40 PM
its4s3_vw-twist-07_motion	Branded Content Media	1920 × 1080p	30	Windshield Video, File Nov 27, 4 44 40 PM
its4s3_vw-drive-08_light	Branded Content Media	1280 × 720p	30	GOPR5785
its4s3_vw-drive-09_light	Branded Content Media	1280 × 720p	30	GOPR5785
its4s3_vw-drive-10_motion	Branded Content Media	1280 × 720p	30	GOPR5785
its4s3_vw-drive-11_motion	Branded Content Media	1280 × 720p	30	GOPR5785
its4s3_vw-helmet-12_grime	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_vw-helmet-13_grime	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_vw-helmet-14_monitor	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_vw-drive-15_color	Branded Content Media	1280 × 720p	30	GOPR5787
its4s3_vw-drive-16_color	Branded Content Media	1280 × 720p	30	GOPR5787
its4s3_vw-drive-17_color	Branded Content Media	1280 × 720p	30	GOPR5787
its4s3_vw-helmet-18_lensflare	Fade In Creative	1920 × 1080p	30	GOPR0008
its4s3_vw-pan-19_grime	Branded Content Media	1920 × 1080p	30	Windshield Video, File Nov 25, 11 16 39 AM
its4s3_vw-pan-20_grime	Branded Content Media	1920 × 1080p	30	Windshield Video, File Nov 25, 11 16 39 AM
its4s3_vw-held-21_grime	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-22_grime	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-23_lensflare	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-24_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-27_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-25_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-26_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-pan-28_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-29_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-30_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-31_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-32_blur	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-33_object	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting

File	Videographer	Resolution	FPS	Raw File
its4s3_vw-pan-34_grime	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-35_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-drive-36_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-drive-37_color	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-38_color	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-39_color	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-walk-40_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-walk-41_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-42_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-43_contrast	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-held-44_blur	Silver Fir Media	1920 × 1080p	60	Silver Fir Media Night1-Ambulanceandshooting
its4s3_vw-pan-45_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-46_lensflare	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-47_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-48_lensflare	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-49_lensflare	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-50_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-51_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-52_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-pan-53_lensflare	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-54_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-55_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-56_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-pan-57_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-held-58_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-drive-59_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-drive-60_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-drive-61_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-drive-62_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain

File	Videographer	Resolution	FPS	Raw File
its4s3_vw-held-63_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-64_blur	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-65_blur	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-66_blur	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-67_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-68_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-69_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-70_contrast	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-fixed-71_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Rain
its4s3_vw-drive-72_obscurant	Silver Fir Media	1280 × 720p	24	Silver Fir Media Rain
its4s3_vw-drive-73_obscurant	Silver Fir Media	1280 × 720p	24	Silver Fir Media Rain
its4s3_vw-drive-74_grime	Silver Fir Media	1280 × 720p	24	Silver Fir Media Rain
its4s3_vw-drive-75_temporal	Silver Fir Media	1280 × 720p	24	Silver Fir Media Rain
its4s3_vw-drive-76_grime	Silver Fir Media	1280 × 720p	24	Silver Fir Media Rain
its4s3_vw-fixed-77_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Snow
its4s3_vw-fixed-78_light	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Snow
its4s3_vw-fixed-79_blur	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Snow
its4s3_vw-fixed-80_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Snow
its4s3_vw-fixed-81_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Snow
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its4s3_vw-fixed-83_obscurant	Silver Fir Media	1920 × 1080p	24	Silver Fir Media Snow
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its4s3_vw-fixed-85_texture	Fireside	4K to 1920 × 1080p	60	A003_C024_0101SW_01.R3D [V]
its4s3_vw-fixed-86_texture	Fireside	4K to 1920 × 1080p	60	A003_C024_0101SW_01.R3D [V]
its4s3_vw-fixed-87_texture	Fireside	4K to 1920 × 1080p	60	A003_C024_0101SW_01.R3D [V]
its4s3_vw-fixed-88_texture	Fireside	4K to 1920 × 1080p	60	A003_C024_0101SW_01.R3D [V]
its4s3_vw-drone-89_color	Immanuel Production group	1920 × 1080p	30	Selects
its4s3_vw-drone-90_color	Immanuel Production group	1920 × 1080p	30	Selects
its4s3_vw-drone-91_texture	Immanuel Production group	4K to 1920 × 1080p	30	GSA Selects
its4s3_vw-drone-92_color	Immanuel Production group	1920 × 1080p	30	Selects

File	Videographer	Resolution	FPS	Raw File
its4s3_vw-drone-93_color	Immanuel Production group	1920 × 1080p	30	Selects
its4s3_vw-drone-94_blur	Immanuel Production group	1920 × 1080p	30	Selects
its4s3_vw-drone-95_blur	Immanuel Production group	1920 × 1080p	30	Selects
its4s3_vw-drone-96_blur	Immanuel Production group	1920 × 1080p	30	Selects
its4s3_vw-drone-97_texture	Immanuel Production group	4K to 1920 × 1080p	30	GSA Selects
its4s3_vw-drone-98_texture	Immanuel Production group	4K to 1920 × 1080p	30	GSA Selects
its4s3_vw-drone-99_texture	Immanuel Production group	4K to 1920 × 1080p	30	GSA Selects

APPENDIX D INSTRUCTIONS

This appendix contains the instructions that were given to the subjects for each session. The instructions were printed and available for reference throughout the test. The Prison Riot and Vehicles & Weather sessions had two sets of instructions: one for real-time and one for playback. Due to an editing error, the Vehicles & Weather session was called “Weather and Vehicles” on the instructions, as shown below.

Crime Scene Instructions Playback

Scenario

This session depicts a simulated death investigation at dusk, filmed with a variety of handheld cameras. Similar video recordings are used by first responder to document scenes, record ephemeral events, depict evidence, and show an accident to emergency room physicians.

System Requirements

- Let people see what actually occurred
- Provide an unbiased account of events
- Create evidence

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see—the camera's performance and the operator's actions.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

1) Get Comfortable

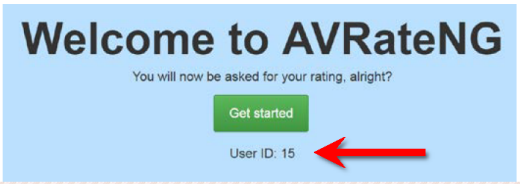
Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

Your laptop has a touchscreen. We recommend you use a stylus.

2) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



3) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

4) Rate the Video

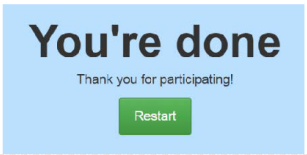
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** relying the recording to understand the crime scene.
Bad	You are **reluctant** to rely on the recording.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

5) Continue

Continue rating videos until the software says you're done.



6) Complete the Questionnaire

Fill out the rest of the questionnaire.

Crime Walkthroughs Instructions Playback

Scenario

This session depicts four simulated death investigations with decedents. Similar video recordings are used by first responder to document scenes, record ephemeral events, depict evidence, and show an accident to an emergency room physician.

System Requirements

- Let people see what actually occurred
- Provide an unbiased account of events
- Create evidence

Warning

This scenario contains simulated gunshot wounds, a drowning victim, and a knife wound.

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

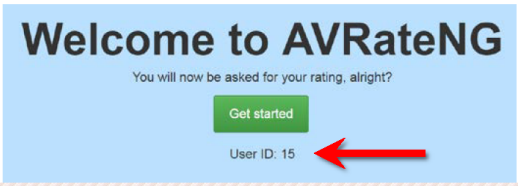
1) Get Comfortable

Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

2) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



3) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

4) Rate the Video

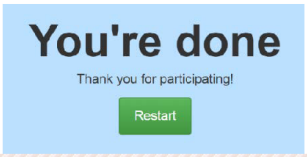
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** relying the recording to understand the crime scene.
Bad	You are **reluctant** to rely on the recording.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

5) Continue

Continue rating videos until the software says you're done.



6) Complete the Questionnaire

Fill out the rest of the questionnaire.

Fireground Instructions Playback

Scenario

This session depicts the aftermath of a neighborhood fire, on a sunny afternoon. The site was filmed with bodycams and handheld cameras. Similar video recordings are used by first responder to record their contacts with the public, document scenes, and record ephemeral events.

System Requirements

- Let people see what actually occurred
- Provide an unbiased account of events
- Create evidence

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

1) Get Comfortable

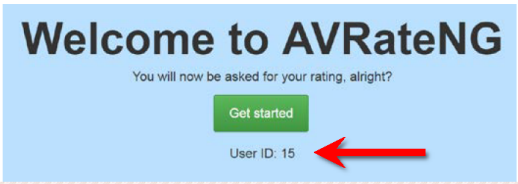
Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

Your laptop has a touchscreen. We recommend you use a stylus.

2) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



3) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

4) Rate the Video

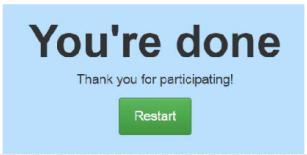
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** relying the recording to understand the fireground.
Bad	You are **reluctant** to rely on the recording.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

5) Continue

Continue rating videos until the software says you're done.



6) Complete the Questionnaire

Fill out the rest of the questionnaire.

Prison Riot Instructions — Real-time

Scenario

The prison riot session depicts tactical training for law enforcement and corrections, from the *2010 Mock Prison Riot*. In this forward looking scenario, bodycam and surveillance videos are live streamed to the command center, using the public safety broadband wireless network.

System Requirements

- Let people view remote locations using mobile and fixed cameras
- Provide situational awareness
- Make real-time, mission critical decisions

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

1) Choose Real-time or Playback

Choose to evaluate the videos for either real-time or playback tasks.

Flip this instruction sheet for the playback scenario.

2) Get Comfortable

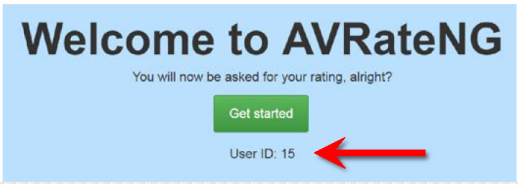
Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

3) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

Check the prison riot session's **real-time** option.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



4) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

5) Rate the Video

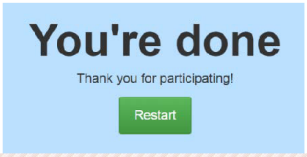
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** making real-time, mission critical decisions.
Bad	You would be **reluctant** to rely on the video stream.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

6) Continue

Continue rating videos until the software says you're done.



7) Complete the Questionnaire

Fill out the rest of the questionnaire.

Prison Riot Instructions — Playback

Scenario

The prison riot session depicts tactical training for law enforcement and corrections, from the *2010 Mock Prison Riot*. First responders use similar body-worn and surveillance video recordings to record their contacts with the public.

System Requirements

- Let people see what actually occurred
- Provide an unbiased account of events
- Review and critique dangerous situation response, for training purposes
- Create evidence

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

1) Choose Real-time or Playback

Choose to evaluate the videos for either real-time or playback tasks.

Flip this instruction sheet for the real-time scenario.

2) Get Comfortable

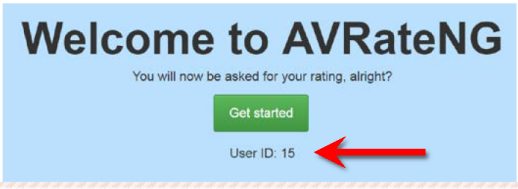
Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

3) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

Check the prison riot session's **playback** option.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



4) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

5) Rate the Video

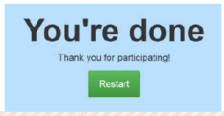
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** relying on the recording to understand what occurred.
Bad	You would be **reluctant** to rely on the recording.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

6) Continue

Continue rating videos until the software says you're done.



7) Complete the Questionnaire

Fill out the rest of the questionnaire.

Search and Rescue Instructions Real-time

Scenario

This session depicts a simulated wilderness search and rescue. In this forward looking scenario, bodycam videos are live streamed to the mobile command center, using the public safety broadband wireless network. A drone is used to remotely search for a lost hiker.

System Requirements

- Let people view remote locations using mobile cameras
- Control an unmanned aerial vehicle (UAV)
- Provide situational awareness
- Make real-time, mission critical decisions

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

The hiker is wearing a red jacket. Can you spot the hiker?

---

1) Get Comfortable

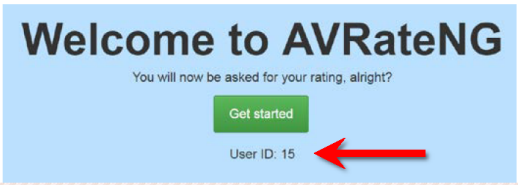
Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

Your laptop has a touchscreen. We recommend you use a stylus.

2) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



3) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

4) Rate the Video

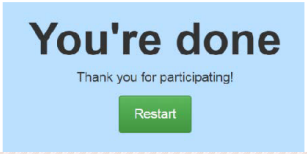
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** making real-time, mission critical decisions.
Bad	You are **reluctant** to rely on the video stream.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

5) Continue

Continue rating videos until the software says you're done.



6) Complete the Questionnaire

Fill out the rest of the questionnaire.

Weather & Vehicle Instructions Real-time

Scenario

First responders operate in environments that are difficult for cameras. Live video monitoring systems contend with rain, falling snow, city streets, streetlights, poor lighting, flashing lights, and moving cars. Video streams are used to monitor buildings, city streets, and critical infrastructure.

System Requirements

- Let people view remote locations using mobile and fixed cameras
- Provide situational awareness
- Make real-time, mission critical decisions

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

1) Choose Real-time or Playback

Choose to evaluate the videos for either real-time or playback tasks.

Flip this instruction sheet for the playback task.

2) Get Comfortable

Arrange the laptop to suit yourself (e.g., screen tilt, distance to screen).

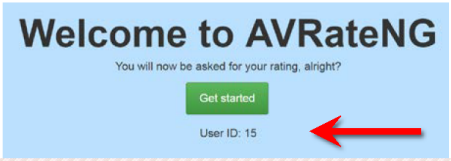
Your laptop has a touchscreen. We recommend you use a stylus.

3) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

Check the weather & vehicle session's **real-time** option.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



4) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

5) Rate the Video

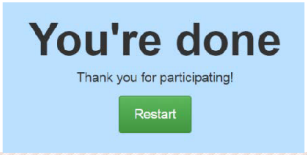
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** making real-time, mission critical decisions.
Bad	You would be **reluctant** to rely on the video stream.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

6) Continue

Continue rating videos until the software says you're done.



7) Complete the Questionnaire

Fill out the rest of the questionnaire.

Weather & Vehicle Instructions Playback

Scenario

First responders operate in environments that are difficult for cameras. Surveillance systems, in-car cameras, and bodycams contend with rain, falling snow, city streets, streetlights, poor lighting, flashing lights, and moving cars.

System Requirements

- Let people see what actually occurred
- Provide an unbiased account of events
- Review and critique dangerous situation response, for training purposes
- Create evidence

Task

- Watch a 4 second video (no sound)
- Rate the video quality
- Repeat 99 times

Tips

Consider everything you see: the camera's performance and the operator's choices.

Ask yourself, "How well does the video meet the system requirements? Would a first responder who has to rely on this video be delighted or annoyed?"

There is no right or wrong answer. Everyone's opinion will be slightly different.

---

1) Choose Real-time or Playback

Choose to evaluate the videos for either real-time or playback tasks.

Flip this instruction sheet for the real-time task.

2) Get Comfortable

Arrange the laptop to suit yourself (i.e., screen tilt, distance to screen).

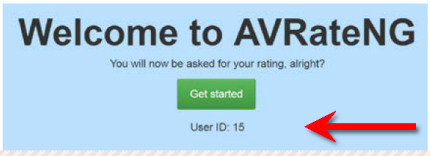
Your laptop has a touchscreen. We recommend you use a stylus.

3) Record Your User ID

Copy your **User ID** from the screen to your questionnaire.

Check the weather & vehicle session's **playback** option.

We are using a web application to play videos and collect your ratings. The starting screen looks like this. Your **User ID** is below the "get started" button.



4) Start the Experiment

Press the "get started" button to start the experiment. The first video will play immediately.

5) Rate the Video

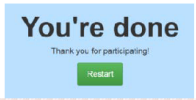
Rate the video quality on a scale of excellent, good, fair, poor, or bad.

Excellent	You feel **confident** relying on the recording to understand what occurred.
Bad	You would be **reluctant** to rely on the recording.
Skip	Oops. You didn't see the video.

Press "submit and continue" to play the next video.

6) Continue

Continue rating videos until the software says you're done.



7) Complete the Questionnaire

Fill out the rest of the questionnaire.

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15. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)

This technical memorandum provides technical details for the video quality subjective experiment **its4s3**. This experiment includes 594 videos, each 4 seconds in duration. The experiment consists of six sessions, each portraying a different public safety scenario. The goals of this experiment are to demonstrate a wide range of quality responses from digital video cameras; to present video sequences suitable for first responder tasks; to begin to understand the video quality difference between video used as evidence and video used for situational awareness; and to collect data from a more representational sampling of people than is usually possible, by conducting the experiment at a large meeting venue. The **its4s3** dataset is intended to train no-reference (NR) video quality metrics. The dataset is freely available for research and development purposes.

16. Key Words (Alphabetical order, separated by semicolons)

camera capture, no-reference metric, public safety, subjective testing, video quality

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