

MRC Cross-Media Audience Measurement Standards (Phase I Video)

September 2019
Final

Sponsoring associations:

Media Rating Council (MRC)

American Association of Advertising Agencies 4A's

Association of National Advertisers ANA

Interactive Advertising Bureau (IAB)

Video Advertising Bureau (VAB)



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1 Executive Summary

The *MRC Cross-Media Audience Measurement Standards* are designed to address the following areas as part of a multi-phased approach:

Electronic measurement of:

- Video advertising and content audiences (Phase I; 2019)
- Display advertising and content audiences (Phase II; TBD)
- Audio advertising and content audiences (Phase II; TBD)

Specifically, the following media vehicles are addressed:

- Video: Television, OTT Delivery and Digital Video (Phase I)
- Display: Hard Copy Newspaper and Magazines, Digital Display and Text (Phase II)
- Audio: Radio, Digital Audio (Phase II)

Digital includes both desktop and mobile digital delivery components. See the description of the phased approach in Section 1.1 for additional details. Non-electronic measurement, such as diary collection, and surveys or coincidental studies are out of scope, but may be addressed in subsequent phases.

Further, the Phase I Standards include the following key tenets (with appropriate Section reference):

Viewable Impression Base:

- Sections 2.1 and 4.1.1: Viewable Impressions are the minimum required qualifying measurement unit for cross-media advertising Reach, Frequency and GRP.
 - Section 2.2.1: For combined, deduplicated cross-media video measurement, a viewability qualification threshold of 100% of pixels on screen for at least two continuous seconds must be utilized for both digital and linear components.

SIVT Filtration:

- Sections 2.1 and 7.2: Cross-media audience must be based on filtration for both General and Sophisticated Invalid Traffic (GIVT and SIVT, respectively).

Comparative Presentation:

- Section 2.1: MRC Compliant media-specific metrics may be reported alongside cross-media metrics using differing bases, but must be differentiated with the cross-media compliant metrics presented as “standard” metrics.
- Section 4.1.9: Cross-media comparisons of content measurement shall be established on a syndicated basis shared across all media outlets; we also encourage development of competitive media reporting of the advertising activities of other organizations.

Duration:

- Section 2.1, 2.1.1, 2.3.2 and Appendix A: For cross-media video audience measurement, total and average Viewable Duration reporting (based on unduplicated viewable duration) at the creative level is required (*immediately applicable*), which allows a report user to independently calculate duration weighting if that user so chooses.
 - Viewable completion (measurement that an ad was viewable during the entirety of length) audience metrics are also required in cross-media video measurement (*immediately applicable*).
 - The reporting of Duration Weighted Viewable Impressions, weighted on a basis relative to creative length is permissible as an additional input into cross-media video advertising Frequency and GRP metrics (*required as an additional metric as of January 2021*).
 - Inability to measure and report duration metrics due to permissible less granular reporting (such as linear advertising and use of content time as a proxy for ad delivery) shall be actively disclosed and should not contribute to duration weighted audience. Duration shall not be inferred when not directly measured unless based on supportable evidence demonstrating the measurement method closely approximates granular duration measurement.
 - Duration weighting shall not be applied to content.

Ad Focus and Measurement Granularity:

- Sections 2.1.2, 2.1.4 and 2.3.3: Cross-media measurement shall occur in a way that allows for the most discrete measurement of advertising as is possible, in consideration of the advertising/content delivery model employed.
 - For combined and deduplicated cross-media video measurement, audiences for ads shall not be inferred based on measurements other than those that measure each discrete ad occurrence with the exception of a broadcast orientation with a static ad model.
 - Planning metrics may be generally stated based on program level measurement or average time-part measurement.
- Sections 4.1.4 and 4.2: Duration measurement for combined and deduplicated cross-media video measurement shall be based on at least second-level time granularity with sub-second granularity recommended (although crediting can be on less granular levels as long as cross-media combinations include the same crediting basis).
 - Measurement that purports to approximate second level granularity such as periodic polling, state changes or encoding insertion and decoding that occur less frequently than every second, is only permissible with empirical support.

Consideration of Audio:

- Section 2.1.5: Where feasible, presence of audio must be measured in determining a Viewable Video Impression (and input into GRP) for cross-media video.
 - Measurement organizations shall separately report Viewable video duration that is also audible (non-mute or non-zero) where this can be measured.
 - If an organization cannot measure audio this shall be disclosed.

Persons Level and Total Population:

- Section 2.1.3: Non-digital components of cross-media measurement shall at least include persons level measurement and be consistent with digital components in addition to household level metrics.
- Sections 2.5 and 4.3: Audience assignment shall only be done at the unique device or, more preferably, unique user level; an audience measurement vendor must have a robust methodology to identify and deduplicate unique devices and/or users.
- Section 3.1: Use of total US population is required (for US measurement; other countries may be used where applicable) for input into cross-media audience-based measurement, although local market and regional populations are permissible.

Direct Measurement and Quality Control:

Section 4.3.1: In identification and attribution processes, measurement organizations must utilize underlying data that is, at least in a reasonable proportion, attributed directly to a person; in no instance may a census measurement organization report on a user or persons basis purely through algorithms or modeling not at least partially traceable to information obtained directly from people.

- Sections 4-10: In addition to the key tenets above, the remainder of this document provides cross-media measurement guidance for: (1) use of script-based, meter and encoding-based and STB/RPD data for measurement; (2) sample-based, panel and census techniques; (3) use of data enrichment and registration data; (4) data collection; (5) data adjustment and editing; (6) data aggregation quality control; (7) computation of reported estimates and weighting; (8) filtration; (9) privacy considerations; and, (10) reporting, disclosure and auditing guidance. These Standards also reference and leverage the *MRC Digital Audience-Based Measurement Standards* where applicable.

1.1 Overview and Scope

This document presents a standard for the measurement of cross-media audiences to video advertising and content (i.e., to content and campaigns delivered across media verticals) using commonly understood audience-based metrics – such as the Gross Rating Point (herein referred to as the “GRP”). The document was prepared for the use and benefit of the media Industry, especially those constituents that analyze audience volumes, composition and behaviors across media and those that monetize audiences to advertising and content (whether buyer or seller).

The “best” methods and approach to measure the cross-media audience of any media is driven by the nature of that medium, its environment, its mode(s) of delivery and how its audience views and interacts with the medium. This document establishes a detailed set of methods and common practices for entities that measure and use cross-media audience-based metrics in order to derive common and consistent metrics in cross-media environments. These Standards are intended to establish and document good practices of measurement; improve practices and disclosures used by practitioners; and provide education to users of cross-media audience-based measurement data from all segments of the Industry. This document also establishes a recommendation and benchmark for audit processes, whereby the practices and disclosures of

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cross-media audience-based measurement organizations can be voluntarily validated by third parties.

These Standards serve as the framework for measuring and reporting audiences for ads and content across video, display and audio that are viewable (audible for audio), filtered for invalid activity, assigned to an audience segment (or in target), duration weighted and comparable/able to be deduplicated across media and delivery types. Specific objectives are:

- 1) Provide for a consistent set of definitions for key elements of cross-media measurement;
- 2) Create a consistent framework to facilitate and advance cross-media comparability;
- 3) Recommend minimum disclosures which shall be provided to measurement data users;
- 4) Provide a clear statement of recommended research operating practices, quality and describe minimum requirements as well as best practices; and
- 5) Encourage experimentation and advances to improve cross-media research quality.

These Standards include consistent elements from existing IAB/MRC digital measurement guidelines as well as the *MRC Minimum Standards for Media Rating Research* and MRC Guidelines for Data Integration, Digital Audio Measurement, Invalid Traffic (IVT) detection and filtration, Location, Viewability (Desktop and Mobile) and Set-Top-Box (STB)/Return-Path data (RPD) measurement.

These Standards also incorporate, reflect and further the content of the *MRC Digital Audience-Based Measurement Standards* promoting consistent audience concepts and requirements in cross-media measurement. The *MRC Digital Audience-Based Measurement Standards* represent the digital input for video ads into a Cross-Media Audience-Based Measurement Standard.

Specifically, these Standards cover the following in a two-phased approach:

Phase I Video (2019):

- Television (linear and Video on Demand or VOD) and digital video combinations and comparisons (for electronic measurement)
- Aligning video exposure measurements across media:
 - Ad and Content segregation (reconciling measurement focus)
 - Individual vs. Household granularity (reconciling measurement units)
- Specific video considerations:
 - Further specificity regarding duration weighting and duration across media
 - Viewability across media
 - Considering presence of audio during video playback
 - Consideration of repurposed TV content
- Tracking and deduplication of users across environments and media

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- Digital content metrics and a framework for a transparent and comparative presentation of content ratings so that all media property estimates are available to all stakeholders
- Setting standards for the processing of RPD audience estimates (advancing earlier work)
- Cleaning data sets and quality control best practices
- Controls over panel methods
- Controls over data enrichment sources and process
- Consistent reporting parameters and disclosures across media

Phase II Other Media (TBD; may require multiple subsequent phases):

- Hard Copy Newspaper and Magazines, Digital Display and Text combinations and comparisons (for electronic measurement)
- Radio and digital audio combinations and comparisons (for electronic measurement; advancing digital audio guidelines to include audience)
- Consideration of other media (such as Out of Home and Digital Place Based)

1.2 Standards Development Method

The Standards contained in this document originated from a project led by the Media Rating Council (MRC) and are part of the Making Measurement Make Sense (3MS) initiative, a joint initiative of the Association of National Advertisers (ANA), the American Association of Advertising Agencies (4A's) and IAB (U.S.). 3MS efforts related to Cross-Media Video also include leadership and participation from the Video Advertising Bureau (VAB). These Standards were developed with the participation of a large group of media content providers, advertising agencies, advertisers, vendors/consultants, measurement organizations and other interested organizations. These Standards involved the participation of major buyer-side trade organizations (4As, ANA) and their constituents and were thereafter provided to the public through a formal period of public comment prior to adoption.

The final Standard is to be published and available on the MRC website and will be re-assessed periodically to ensure it remains applicable over time.

1.3 Note on Privacy

Along with the general principles discussed in Section 7.3, all data collection, processing and transmission processes must adhere to applicable privacy regulations and requirements. Data collectors and users should ensure proper permissions and access rights are present. MRC acknowledges that such privacy requirements may prevent inclusion or otherwise require anonymization of some data fields, particularly those related to user identifying or targeting data. **It is critical that privacy be considered and protected in all aspects of Cross-Media measurement.**

2 General Top-Line Measurement

2.1 Cross-Media Components

The MRC has authored *Digital Audience-Based Measurement Standards* as a separate document and the guidance for measurement definitions contained therein references and applies to cross-media measurement. While most of that guidance will not be repeated within this document, a few key tenets are re-emphasized. Specifically, for cross-media video ad impression audience measurement:

- While Served Ad Impressions (digital ads and linear commercials) may be measured in aggregate in cross-media environments, Viewable Impressions (***using the cross-media criteria stipulated in this document***) are the minimum required qualifying measurement unit for cross-media advertising Reach, Frequency and GRP in both television and digital components.
- Cross-media audience must be based on filtration for both General and Sophisticated Invalid Traffic (GIVT and SIVT, respectively) including invalid traffic that may exist in television components where applicable (see further detail throughout this document).
- For cross-media video audience measurement, total and average viewable duration reporting (based on unduplicated viewable duration) at the creative level is required, which allows a report user to independently calculate duration weighting if that user so chooses. Further, the reporting of Duration Weighted Viewable Impressions is, at this time, not required, but permissible for input into cross-media advertising Frequency and GRP (see **Section 2.1.1 and Appendix A for guidance and requirements related to Duration Weighting**). The MRC currently plans to require Duration Weighted Viewable Impressions as an additional metric for cross-media video advertising Frequency and GRP beginning in January 2021.
- Cross-media measures that do not incorporate viewability and SIVT filtration may still be reported *in addition* to fully compliant metrics with proper labeling, segregated reporting and clear disclaimer (these would not be considered fully compliant with the requirements of this Cross-Media Audience Standard, but can be audited and accredited as long as fully compliant corresponding metrics are also reported and audited).

Reach

For purposes of cross-media measurement Reach represents unique users, unduplicated homes or audience who have been exposed to ads or content (have generated a Viewable Impression) at least once during a time period (daypart, program or any piece of content) expressed as a percentage of the measured population, universe or target. Unique audience reporting necessitates de-duplicating individuals with multiple exposures over the measured time period.

Reach is calculated as:

$$[(\Sigma \text{ Unique Audience with a Viewable Impression}) \div (\text{Measured Population, Universe or Target})] \times 100$$

Reach can also be presented as a whole number representing the sum of unique users, unduplicated homes or audience who have been exposed to ads.

Frequency

For purposes of cross-media measurement Frequency represents the number of times a user, home or audience generated a Viewable Impression and contributed to Reach within a Session or time period expressed as an average among those unique users, unduplicated homes or audience who have been exposed to ads (have generated a Viewable Impression).

Frequency is calculated as:

$$(\Sigma \text{ Viewable Impressions}) \div (\Sigma \text{ Unique Audience with a Viewable Impression})$$

See Appendix A for details of how duration weighting should be applied to cross media Frequency calculations; this will be required as an additional metric as of 2021.

Rating

Cross-media Ratings may be calculated for re-purposed TV content or other episodic content as well as for specific measurement for discrete time periods. For purposes of cross-platform measurement a Rating percentage is calculated as: (A) the number of Viewable Impressions a user, home or audience generated divided by (B) measured population, universe or target. The presence of a measured period of time is a critical component of a rating.

Ratings are calculated as:

$$[(\Sigma \text{ Viewable Impressions}) \div (\text{Measured Population, Universe or Target})] \times 100$$

The sum of digital campaign Ratings points across various pages, properties and applications equals the campaign total GRPs.

Gross Rating Point (GRP)

The sum of all the Ratings for a specified advertisement or advertising campaign reported as a gross number. Reach multiplied by Frequency equals Gross Rating Points. Similarly, Viewable Impressions divided by Universe multiplied by 100 equals Gross Rating Points.

Total GRP is calculated as:

$$\Sigma \text{ Gross Rating Points}$$

Or

Reach x Frequency

Or

$$[(\Sigma \text{ Viewable Impressions}) \div (\text{Measured Population, Universe or Target})] \times 100$$

See Appendix A for details of how duration weighting should be applied to cross media frequency calculations as an input into GRP; this will be required as an additional metric as of 2021.

Notes for Rating and GRP Definitions:

The measures above can be calculated for program content for a time-period using the same mathematical approach. Activity (browsers, users, etc.) included in audience must have both the opportunity to see the ads/content and sufficient evidence of time spent during the measured time period (meeting Viewable Impression requirements).

For reporting purposes, audiences can be segregated based on demographic or other characteristics as well as day-parts and/or week-parts. Inferences, adjustments and assignment of audience information as well as projection methods and impacts shall be disclosed with the reported estimates or as part of methodological reference materials.

Creative or placement level minimum reporting granularity is required within campaign reporting, although campaign and brand roll ups are permissible. Audience measurement may also be aggregated at the platform level such as desktop, mobile web and in-app and within format such as display and video, along with the minimum segregated reporting discussed above. Further, total viewable time spent across ads of differing length within the same format is permissible in addition to appropriate granular creative-level reporting. Finally, total impressions delivered or Reach across display and video formats within a campaign may be reported; however, combined display and video format audience including demographic or otherwise assigned segmented audience measurement is allowable, but not a requirement of this Cross-Media Audience Standard due to differing viewability requirements in cross-media by ad format.

These Standards do not recommend that cross-media metrics replace media-specific (e.g., digital vs. TV, etc.) metrics and instead encourage media-specific metrics to remain in place for each respective media with cross-media metrics as additional metrics. However, MRC compliant media-specific metrics may be reported alongside cross-media metrics or within the same report for cross-media measurement products using differing bases (for example digital video viewability using a 50% pixel criteria with no consideration of audio vs. cross-media video viewability using a 100% pixel criteria with consideration of audio). In cross-media reports and products, metrics with differing bases shall be clearly differentiated (via labelling, metrics definitions, and/or general descriptions of reporting options) with the cross-media compliant metrics presented as “standard” metrics and media-specific metrics presented as “diagnostic” in nature.

2.1.1 Duration Weighting

Appendix A of this document details MRC's efforts to study and research the value of duration in order to derive an approach for duration weighting requirements in cross-media measurement. We encourage detailed reading of the basis for the position ultimately adopted in this standard, but it can be summarized as follows:

- Cross-media advertising Reach, Frequency and GRP in both television and digital components must be based on Viewable Impressions (using cross-media criteria discussed further in this Standard) and filtered for SIVT.
- For cross-media video audience measurement, total and average Viewable Duration reporting (based on unduplicated viewable duration) at the creative level is required, which allows a report user to independently calculate duration weighting if that user so chooses.
- Viewable completion (measurement that an ad was viewable during the entirety of length) audience metrics are also required in cross-media video measurement and are a valuable metric for confirming delivery of the full video creative length as designed.
- Other duration metrics such as quartiles or other binary progress metrics are permissible, but not required.
- The reporting of relative Duration Weighted Viewable Impressions (See Appendix A for more details) is, at this time, permissible *as an additional input into cross-media video advertising Frequency and GRP metrics*, but not required.
- Duration Weighted Viewable Impressions for input into cross-media video advertising Frequency and GRP will be required in addition to, not in replacement of, cross-media video advertising Frequency and GRP that does not incorporate duration, beginning in January 2021.
 - This Standard continues the previous guidance put forward in the December 2017 *Digital Audience Measurement Standards* to calculate duration weighting relative to creative length.
- Inability to measure and report duration metrics due to permissible less granular reporting (such as linear advertising and use of content time as a proxy for ad delivery) shall be actively disclosed and should not contribute to duration weighted audience. Duration shall not be inferred when not directly measured unless based on supportable evidence demonstrating the measurement method closely approximates granular duration measurement.

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- Cross-media measures that do not incorporate Viewability and SIVT filtration may still be reported *in addition* to fully compliant metrics with proper labeling, segregated reporting and clear disclaimer (these would not be considered fully compliant with the requirements of this Cross-Media Audience Standard, but can be audited and accredited as long as fully compliant corresponding metrics are also reported and audited).
- Cross-media video measures that incorporate Viewability and SIVT filtration but do not incorporate Duration Weighting, even after duration-weighting is also required in January 2021 shall be reported in addition to those that incorporate Duration Weighting and are compliant with the requirements of this Cross-Media Audience Standard.
- Duration weighing is NOT a measure of ad effectiveness and is not recommended to be utilized on a standalone basis in this manner; duration weighted metrics are intended to be utilized in conjunction with ad effectiveness and ROI metrics in order to enable comparative evaluation of spend, delivery and return based on campaign design and objectives.

2.1.2 Cross-Media Metrics Definitions

MRC's *Digital Audience-Based Measurement Standards* detail the definition and calculation of various audience metrics that exist and can be applied to cross-media measurement of advertising including Impressions (which are also defined in various IAB/MRC digital measurement guidelines) as well as Ads and Content such as Reach, Frequency, Rating and GRP. Those metrics will not be repeated herein and shall be referred to and consistently applied to cross-media measurement.

However, beyond the updates discussed above and in Appendix A related to duration weighting, this document does consider certain aspects of these metrics differentially for cross-media application including population denominators, viewability requirements and content measurement discussed in further detail below and throughout this document. Where applicable, this document will call out any additional considerations or requirements for population, viewability, duration weighting and content as inputs into audience metrics where applicable.

Finally, the inclusion of content within this Cross-Media Audience Standard necessitates coverage of other content metrics more traditionally applied to linear video media such as average time-part measurement including Average Quarter Hour (AQH) and Average Minute Audience (AMA).

AQH is a legacy metric used in traditional linear measurement representing the number of individuals, homes or target group viewing a station, channel or piece of content during a clock quarter hour/fifteen-minute segment of the hour, or the aforementioned persons estimate expressed as a percentage of the population being measured (reported at the MSA, DMA or TSA level).

AMA is the average number of individuals, homes or target group viewing a station, channel or piece of content, which is calculated per minute during a specified period of time over the program duration. AMA can further be delineated by whether or not these minutes contain commercials.

Such content level metrics can be measured and reported for digital components of cross-media measurement and shall be clearly and consistently defined and applied on the same basis. However, depending on the content and delivery models employed, content metrics may have limited value as a surrogate for direct measurement of ad delivery. See sections 2.2.3 and 2.3 for further discussion regarding appropriate and permissible use of content metrics related to ad delivery.

2.1.3 Household vs. Individual Metrics

Non-digital metrics may include measurement units based on entire households and the presence of demographics within these households, whereas digital metrics are typically at the persons or individual level. While there is value to household level digital measurement including targeting based on the presence of various demographics within a household, and methods to construct households by associating disparate individuals shall be empirically supported, non-digital components of cross-media measurement shall at least include persons level measurement and be consistent with digital components. Household level cross-media metrics are permissible in addition to persons level metrics when both digital and non-digital components utilize the same measurement units (household and persons level measurement shall not be mixed in cross-media measurement).

Large scale, passive data sets may be incorporated into cross-media measurement in order to measure media consumption at scale. However, many of these data sets do not include persons level or otherwise identifying information and require overlaying of other data to approximate persons level measurement. This is permissible within these Standards and is subject to further guidance related to data matching, editing and adjustment. However, wherever possible, direct persons level measurement is preferred for combined and deduplicated cross-media video measurement. This applies in digital where media consumption is often personal on individual devices, but even in linear media where consumption is increasingly individualized. Further, adjustment of audience to project raw media exposure to account for persons such as in co-viewing extensions, must be based on rigorous, empirically supported and auditable methods with some meaningful component based on directly collected deterministic persons measurement.

2.1.4 Segregation of Content/Advertising Vehicles and Media

Measurement of digital advertisement delivery and content audiences are generally performed separately, versus the generalized measurement orientation that currently exists for legacy broadcast media (inferring the same audience to the content and advertising). It is critically

important that measurement organizations consider varying types of content and advertising delivery models when they are establishing measurement and reporting.

Different types of content and advertising delivery models shall be separately tracked and considered for reporting purposes (either segregation or clear delineation) and clearly described to users of measurement and audience data. These standards recommend that measurement occur in a way that allows for the most discrete measurement of the audience as well as advertising contained within content as is possible, in consideration of the advertising model employed and the characteristics of the technology used to deliver the content. See Section 2.2.3 of this document for further guidance on the use of content metrics to represent ad delivery.

It is critical that activity measurement is granular enough to segregate ad types and media for input into audience-based reporting. Accordingly, audience assignment methods shall be equally granular, which may involve certain sample size and data-adjustment challenges to audience assignment techniques. Likewise, measurement of ads shall be segregated and distinct from measurement of content (inclusive of ads either pre/post/mid roll or standard commercial pod). The basis for measurement shall be disclosed. It is encouraged that measurement vendors utilize the same measurement assets and methodology to measure ads and content wherever possible, while maintaining the ability to distinguish between the two and separately track and credit them.

2.1.5 Audio Considerations

As current technological limitations make it difficult or impossible for a measurer to detect the presence of unmuted audio in all situations (while player audio may be more readily detectable, device or hardware muting detection may present challenges), detection of audio is not currently a requirement for *standalone* digital Viewable Video Ad Impressions outside of these Cross-Media requirements. However, we encourage the development of a technological or other solution to device or hardware limitations so that audio may be considered in the future for standalone digital measurement.

However, these Standards require the presence of audio (non-zero volume or non-mute conditions) to be measured for both linear and digital components in determining a Viewable Video Impression (and input into GRP) for cross-media video measurement in those situations where it is feasible to do so today.

Existing measurement service capabilities utilize varying techniques to identify video content. These techniques can be centered on capturing audio or video through mechanisms such as watermarking, fingerprinting or encoding. These mechanisms need to be validated and empirically supported for their completeness and accuracy and special consideration shall be given to controls to detect mismatches between or lack of one of audio or video as well as how these conditions are resolved.

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Measurement organizations shall separately report Viewable video duration that is also audible (non-mute or non-zero) where this can be measured. If an organization cannot measure audio this shall be disclosed along with the cause of this limitation (such as use of raw tuning records without audio indicators). This does not disallow reporting on viewable impressions without audibility as long as audible/viewable impressions are reported where known (with appropriate labeling).

Some video ads may not have audio, which may represent a limitation of future considerations of audio measurement requirements. The use and consideration of audible conditions (or lack thereof) must be fully disclosed along with the methodology used to measure audibility and any related limitations. Audible exposure without viewability is not qualified for audience measurement except in audio-only applications.

Finally, video content and ads may be played without audio, but with captions enabled. The presence of captions where it can be measured and determined, even if the presence of audio is either not able to be determined or is determined to be mute or zero, can qualify audible, as long as this is clearly disclosed to users within methodological materials and reporting.

2.2 Impression Counting

An Ad Impression is generally a measurement of delivery of an ad that meets established minimum thresholds for quality and the terms and conditions established between a seller and a buyer. A Digital Video Ad Impression is the measurement of response from a digital video ad delivery system to an ad request from the digital video content host. A valid digital video ad impression may only be counted when an ad counter (logging server) receives and responds to an HTTP request for a tracking asset from a client. The count must happen after the initiation of the stream, post-buffering, as opposed to the linked digital video content itself. Specifically, measurement shall not occur when the buffer is initiated, rather measurement shall occur when the ad itself begins to appear (begins to play).

Valid Ad Impressions must meet the minimum requirements of the various existing IAB/MRC digital measurement guidelines for the applicable creative type (Display, Rich Media or Video) and user environment (desktop browser, mobile web and application environments). See the applicable IAB/MRC digital measurement guidelines (Desktop Display, Mobile Web, Mobile Application and Video) for further details of Ad Impression measurement guidance.

Further, measurement vendors are strongly encouraged to develop impression-level measurement of non-digital video ads, such as those present in linear TV (including VOD and OTT), that involves discrete commercial measurement in lieu of broader time or program-based measurement that serves as a proxy for commercial delivery. As discussed above, for dynamic ad and content models discussed earlier in this document, audiences for ads within the content shall not be inferred based on measurements other than those that measure each discrete ad occurrence (impressions and viewable impressions) for combined and deduplicated cross-media video measurement.

See Section 4.1 of this document for further details related to technical details of tracking of advertising access.

2.2.1 Viewable Definition for Video Ads in Cross-Media

Background

An Ad Impression must meet certain pixel and time thresholds in order to qualify as a Viewable Impression. See the *MRC Viewable Impression Measurement* and *MRC Mobile Viewable Impression Measurement Guidelines* for guidance on Viewable Impressions. For counting of viewable ad impressions, existing key concepts of impression counting shall be followed, as detailed in previously issued IAB/MRC digital measurement guidelines.

Viewability for digital display and video, mobile and desktop ad impressions has become a widely used transactional metric in the last few years. The MRC standard for viewable digital ad impressions was a first step in a broader cross platform measurement plan. It was not purely an end in and of itself. From its inception, the viewable impression was intended to bring digital ad impression measurement closer to commonality with other media impression measurement, especially, but not only, to that of TV. The notion of comparably measured impressions is foundational to the ability to count and combine across media platforms.

It is clear that time spent viewing content and ads are an important tool for audience and media assessments. By definition, ad viewability measurement includes measuring for how long an ad was in view on screen at the required pixel level. Conceptually this “opportunity to see” (or OTS) the digital ad upon its delivery is aligned with the fundamental notion in marketing that advertising can have an effect on people who are exposed to it. “Opportunity to See” is basic to advertising; for example, TV and print each carry advertising that renders fully on a screen or page, respectively.

The *Digital Audience-Based Measurement Standards* specify that a viewable impression is the qualifying unit for inclusion of a digital ad impression in audience-based measurement. This holds for both digital only and cross-media platform reach, frequency, rating and GRP calculations. By doing so, digital audience-based measurement approaches commonality with other media, making it easier to compare digital and other media for planning, buying and evaluating. Moreover, this accomplishes another goal, that of ensuring that, piece by piece, desktop and mobile, regardless of creative unit type, digital audience-based measurement is always comprised of viewable impressions.

Research

However, further research was requested as part of setting this Cross-Media Audience Standard to reassess the pixel requirement for viewability to determine the impact of raising it to a 100% minimum for cross-media reporting. MRC considered this approach as use of a 100% pixel threshold in cross-media comparisons and combinations introduces consistency between other forms of media and traditional TV environments generally don’t experience conditions where less than 100% of pixels of an ad are displayed on screen (although in today’s environment

some edge cases may exist and need to be considered) and as a result, measurement likely does not include consideration of pixels. Use of a 100% pixel threshold also reduces the need for custom viewability criteria (many of which feature 100% pixel requirements).

However, we acknowledge this may still be impactful to the digital component of cross-media measurement and may also be challenging in certain environments (for example, newsfeeds) where the current parameters are already a challenge. As such, the objective of our request for data and research was to assess the feasibility of this change as well as to dimension the impact overall in specific environments. Seven different organizations provided either granular or generalized datasets related to our request for research. These included recall surveys, eye-tracking and biometric studies and research and granular data to varying degrees including analysis of over 3 billion impressions.

Data analyzed in response to this call for research varied. In more general (non-newsfeed) digital environments, it appeared the impact of a move to a 100% pixel viewability requirement would be minimal (averaging 3-9% of viewable impressions meeting a 50% pixel threshold vs. a 100% pixel threshold, with higher impacts related to display ads and mobile environments). At the time of initial studies conducted by MRC when setting viewability thresholds, data showed that if the 50% pixels criteria were met, the entire ad was viewable in nearly 80 percent of the cases. Research received as part of our efforts related to cross-media measurement suggested that percentage is higher today across the general Internet, as properties are better optimized for viewability than they were in 2012.

However, data received and analyzed as part of setting this Cross-Media Audience Standard that were focused on mobile newsfeed environments with vertical scroll, showed that a change to a 100% pixel requirement for video viewability would represent a material reduction in reported viewable impressions, including exposures meeting the current MRC viewability requirements that are being credited for conversions via attribution models, ranging as high as between 25-40% for certain platforms.

Outcome

While MRC has limited insight into attribution models used to conduct this research and some skews were found in this data, we found it compelling enough such that we are not recommending changing viewability requirements for standalone digital video as part of this Cross-Media Audience Standard. MRC will be working to set standards for lift and effectiveness measures beginning in 2019.

However, in instances where digital and linear video ad audience measurement will be combined into deduplicated cross-media measurement, it is required that a viewability qualification threshold of 100% of pixels on screen for at least two continuous seconds is utilized for both digital and linear components. This requirement is based on the supporting reasons detailed above, but also the overriding objective of consistent and equal measurement bases for digital and linear components in cross-media combinations.

Where ads and content are displayed to a TV (linear or OTT), it may be assumed that the 100% pixel criteria for viewability is met without direct measurement, although time threshold requirements still apply (2 continuous seconds for video) as do considerations related to obstructions, occlusions and TV limitations discussed later in this document. See Section 4.1.1 for further details related to technical aspects of viewability measurement in digital and non-digital environments.

Digital components using a 50% pixel viewability criteria may still be reported on a standalone basis and in comparison to linear measurement, as long as the bases for measurement of each measurement is clearly disclosed within reporting. MRC intends to conduct further research as part of potential future updates of the viewability guidelines to determine if digital viewability thresholds should be modified.

As discussed earlier in this document, these Standards do not recommend that cross-media metrics replace media-specific metrics (e.g., digital vs. TV, etc.), and instead encourage media-specific metrics to remain in place for each respective media with cross-media metrics as additional metrics. However, to the extent MRC compliant media-specific metrics are reported alongside cross-media metrics or within the same report for cross-media measurement products using differing bases, these metrics shall be clearly differentiated (via labelling, metrics definitions, and/or general descriptions of reporting options) with the cross-media compliant metrics presented as “standard” metrics and media-specific metrics presented as “diagnostic” in nature.

Please note, the definition of viewability relates to delivery of an ad with sufficient opportunity to see (OTS) based on the number of pixels that are on a screen for a specific amount of time. It should not be confused with visibility (which often means any portion of an ad is on screen for any time) nor be used to imply presence of a user or that an ad has been viewed/seen. While certain measurement controls such as people meters and other factors such as user initiated sessions and the personal nature of mobile devices, may create stronger linkage between ad delivery and presence of a user, they are not absolute. Viewable conditions may occur without the presence of a user in digital (such as in Auto-Play), OTT and linear environments.

2.3 Content Measurement

Content measurement can be captured in general average audience metrics GRP, Reach and Frequency. Previous content requirements (if any) discussed in the MRC *Digital Audience-Based Measurement Standards* are superseded by the guidance contained in this document.

See Section 4.1 of this document for further details related to technical details of tracking of content.

2.3.1 Viewability for Content

The same cross-media video viewability thresholds used for ads (100% of pixels on screen for at least two continuous seconds) shall be applied to content in order to qualify as viewable and for

inclusion in cross-media audience. However, time based qualifiers over and above two continuous seconds for content audience measurement are permissible with empirical support and clear disclosure as well as consistent treatment in digital and non-digital components of cross-media measurement.

As stated below, for combined and deduplicated cross-media video measurement, audiences for ads within the content shall not be inferred based on measurements other than those that measure each discrete ad occurrence with the exception of a broadcast orientation with a static ad model. Likewise, viewability of ads shall not be inferred based on viewability of content metrics in dynamic ad models and even where content metrics are permissible as a proxy for ad delivery measurement, inference of ad viewability shall be based on controls to confirm continuity of the viewability state over the period of measured content along with qualification, edit, tabulation and inactivity rules empirically supported by auditable evidence.

2.3.2 Content Duration Weighting

Duration weighting shall not be applied to content; however, where content metrics are used for planning or as proxy for ad delivery (see permissible uses in the following section) total and average viewable duration reporting of cross-media audiences is required. Average duration may be based on logical reporting units such as timepart/daypart or program.

2.3.3 Use of Content Metrics

Content measurement may be captured to assist sell-side with content research, audience appeal and flow, in addition to serving as a means to determine corresponding ad delivery and to gauge reach. Sell-side organizations seek to maximize audience size and desirable characteristics of the audience (for targeting purposes). Ad measurement is essentially captured to enable monetization of advertising between advertisers/agencies, the buyers of advertising time, and sellers, the media outlets.

Planning metrics may be generally stated based on program level measurement or average time-part measurement including Average Quarter Hour (AQH) and Average Minute Audience (AMA). Measurement for advertisement delivery (meaning an ad was served or viewable [had an opportunity to be seen]) represents a counting orientation such as a Served or Viewable Ad Impression or audience assigned reach and frequency of discrete exposure to the advertisement. Both advertisement, audience assigned advertising and planning type metrics related to content can be subjected to discrete gross rating point measurement, assuming proper granularity of tracking assets and audience attribution methods. In cases where the measurement does not rely on a full census orientation, measurement at a local level may be challenging because of sample size and/or data quality considerations (quality considerations may include coverage, representation of the population being measured, data loss, bias, etc.).

Measurement of advertisement delivery and ad or content audiences are generally performed separately, versus the generalized measurement orientation that currently exists for legacy media (inferring the same audience to the content and advertising). **It is critically important**

that measurement organizations consider varying types of content and advertising delivery models when they are establishing measurement products, measurement and reporting.

Today's content and advertising delivery models can include:

(1) A multicast orientation with a dynamic ad model, where differing content is sent to each device (essentially all devices that access the content vehicle access unique content), with each device also receiving different advertisements which are controlled and inserted separately and where the user may have a certain level of control over the consumption environment in areas such as skipping content or advertising. This model is more prevalent with digital video delivery, but also occurs with Video On Demand (VOD) and streaming video consumption.

(2) A broadcast orientation with a dynamic ad model, where a single set of content is sent to multiple devices simultaneously (essentially all devices that access the broadcast); however, devices are intended to receive different advertisements from the broadcast origination which are controlled and inserted separately. This model may occur in various scenarios such as simulcasts of live video content where commercial or ad load may vary including network broadcasts with local insertion (see further discussion of treatment at the local level below), Internet carriage of broadcast content, Virtual Multichannel Video Programming Distributors or vMVPDs and addressable TV dynamic ad models.

(3) A broadcast orientation with a static ad model, where a single linear set of content and advertisements are sent to multiple devices simultaneously (essentially all devices that access the broadcast), with all receiving the identical set. This is the traditional linear model that most often occurs in TV; however, digital simulcasts of content may also follow a static ad model.

It should be noted that a model in which the same ads but different content is sent to users simultaneously is possible, but has not been widely used to date and is therefore not covered at this time in these standards.

Specifically, different types of content and advertising delivery models shall be separately tracked and considered for reporting purposes (either segregation or clear delineation) and clearly described to users of measurement and audience data. For audience planning purposes (pre-buy), users may evaluate potential audiences reachable by a delivery model; these orientations could be on the basis of the total delivery model audience, market audience or within projected demographic breaks. In all cases, the measurement service shall be able to demonstrate that planning bases represent realistic scenarios whereby actual ad campaigns can be executed, not merely a "theoretical reach" (such as those occasionally used in social media networks based on user association or across a digital platform where run of site buys are not offered).

Measurement approaches for ad delivery may include, but are not necessarily limited to, the following:

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Ad Delivery Monetization Metrics: Measurement of each individual ad exposure (Served or Viewable Impressions with Viewable Impressions required as input into Audience measurement). Since discrete ad transactions are measured, this method can be applied to all ad delivery models described above.

Planning Metrics:

- A. Measurement of time-parts for content such as AMA over a defined period of time including commercial minute audience.
- B. Measurement of Programs or Network level roll ups.
- C. Measurement of AQH over a defined time period, inclusive of both ads and content, for a specific demographic group.

Planning metrics shall also allow exclusion of activity to “ad free” or other forms of non-ad-supported content. While non-ad supported content should be measured and reported, it shall be clearly distinguishable from ad-supported content, especially when used for planning of ad delivery.

These Standards recommend that cross-media video measurement occur in a way that allows for the most discrete measurement of the audience as well as advertising contained within content as is possible, in consideration of the advertising model employed and the characteristics of the technology used to deliver the content. For example, in advertising model 1 noted above (different content, different ads), because different ads are sent to each user, each ad shall be measured discretely, and audiences for each ad/ad campaign shall be reported. Similarly, for advertising model 2 (common content, different ads), since different ads are delivered to listeners within a common stream of content, these ads shall be measured and reported discretely as well; please note that this does not preclude the reporting of additional measurements that incorporate measurements of the content portion of the delivery.

For advertising model 3 (a broadcast orientation with a static ad model), it is not required that the ad impressions be measured discretely (although again, it is not precluded), since under this model all ads are delivered in a common way, along with content. In other words, measurement of content time or time periods (such as AQH or average minute) during the presence of commercials or ads, inclusive of skipping or scrubbing, as a proxy for ad delivery is permissible with the proper granularity as stipulated in this Standard. In this situation the ad may be considered served and viewable for purposes of impression measurement (presuming other TV viewability considerations spelled out in this document are addressed). Inability to measure and report duration metrics due to permissible less granular reporting shall be actively disclosed and should not contribute to duration weighted audience. Duration shall not be inferred when not directly measured unless based on supportable evidence demonstrating the measurement method closely approximates granular duration measurement. It is MRC’s belief that inability to include measurement of content or time periods as a proxy for ad delivery in duration weighted audience and the increasing penetration of Dynamic Ad Insertion or DAI such as in addressable TV, will reduce the permissible use cases of less granular measurement that is not based on impressions.

Additionally, simulcasts of linear video content where commercial or ad load varies due to network broadcasts with local insertion may be treated as model 3 (a broadcast orientation with a static ad model) when reporting on the local level where all reported tuning sessions involve static content and ad load. However, this would not apply to Network level roll-up.

For combined and deduplicated cross-media video measurement, audiences for ads within the content shall not be inferred based on measurements other than those that measure each discrete ad occurrence with the exception of a broadcast orientation with a static ad model (model 3) discussed above. If the same content is distributed with differing ad delivery models (for example content delivered to linear TV with static ads under model 3, but also distributed digitally with dynamic ads under model 2), the respective linear and digital measurement shall adhere to the above requirements; measured at the impression level for dynamic ads with content level measurement permissible for static delivery. Combination of ad delivery for this content across media is permissible, as long as it is done so on a common (static content measurement can be converted to represent impressions with appropriate support for this conversion).

Finally, content measurement is equally important for legacy non-digital media, as well as digital media, and measurement organizations are encouraged to measure both ads and content across-media.

2.4 Duration

Duration is the amount of elapsed time from the initiation of ad or content exposure to the last audience activity (end of session) associated with that same exposure. As discussed in the *MRC Digital Audience-Based Measurement Standards*, for cross-media video audience measurement, total and average unduplicated viewable duration reporting at the creative level is required, which allows a report user to independently calculate duration weighting if that user so chooses. Further, MRC highly encourages the reporting of combined and deduplicated cross-media video metrics on a duration weighted basis in addition to cross-media video metrics based on viewability and SIVT filtration. However, due to the complex changes necessary to widely adopt duration weighting across the ecosystem, these Standards do not currently require duration weighting to be incorporated in cross-media video audience metrics.

Our aspiration is that measurement systems and transactional practices are modified to allow for discrete creative and duration tracking to promote broad acceptance of duration weighted cross-media video audience metrics. The MRC currently plans to require Duration Weighted Viewable Impressions for input into cross-media video advertising Frequency and GRP in addition to, not in replacement of, cross-media video advertising Frequency and GRP that does not incorporate Duration Weighting beginning in January 2021.

Cross-media video measures that incorporate Viewability and SIVT filtration but do not incorporate Duration Weighting, even after duration-weighting is also required in January 2021

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are permissible in addition to those that incorporate Duration Weighting and would be considered compliant with the requirements of this Cross-Media Audience Standard.

Creative or placement level minimum reporting granularity is required within campaigns although campaign and brand roll ups are permissible. Audience measurement may also be aggregated at the platform level such as desktop, mobile web and in-app and within format such as display and video, along with the minimum segregated reporting discussed above. Further, total viewable time spent across ads of differing length within the same format is permissible in addition to appropriate granular creative-level reporting. Finally, total impressions delivered or Reach across display and video formats within a campaign may be reported; however, combined display and video format audience including demographic or otherwise assigned segmented audience measurement is allowable but not a requirement of this Cross-Media Audience Standard due to differing viewability and duration weighting requirements in cross-media by ad format.

The *IAB/MRC Digital Video Impression Measurement Guidelines* contain specific guidance related to the capture, processing and reporting of duration. In addition, see Section 4.3 of this document for further details related to technical details of tracking of duration.

For a broadcast orientation with a static ad model, it is not required that the ad impressions be measured discretely (although again, it is not precluded), since under this model all ads are delivered in a common way, along with content. In other words, measurement of content time or time periods (such as AQH or average minute) during the presence of commercials or ads, inclusive of skipping or scrubbing, as a proxy for ad delivery is permissible with the proper granularity as stipulated in this Standard. In this situation the ad may be considered served and viewable for purposes of impression measurement (presuming other TV viewability considerations spelled out in this document are addressed). Inability to measure and report duration metrics due to permissible less granular reporting shall be actively disclosed and should not contribute to duration weighted audience. Duration shall not be inferred when not directly measured unless based on supportable evidence demonstrating the measurement method approximates granular duration measurement.

2.5 Audience Assignment

Audience measurement generally involves assigning characteristics to a unique device or user either for attribution of ad and content exposure or audience-based targeting of advertisements. Assignment of demographics, behaviors or other targeting characteristics to users with ad or content exposure may involve several different deterministic methods such as use of directly collected (first party), passively tracked (third party) or declared data as well as probabilistic methods such as inferred, or otherwise modeled data. While this document may apply to assignment of purchase behavior to users for purposes of audience reporting (such as in use of past purchase categories as a targeting demographic), it does not include attribution of such purchase behavior to a single ad or content exposure nor does it include offline attribution.

While the *IAB Audience Reach Measurement Guidelines* establish certain levels of unique measurement, audience assignment shall only be done at the unique device or, more preferably, unique user level. As a result, an audience measurement vendor must have a robust methodology to identify and deduplicate unique devices and/or users for such assignment. See the *MRC Digital Audience-Based Measurement Standards* as well as Section 4.3 of this document for further guidance.

2.5.1 Qualifying for Audience

As discussed above, the *Digital Audience-Based Measurement Standards* specify that a viewable impression is the qualifying unit for inclusion of a digital ad impression in audience-based measurement. However, the definition of viewability should not be used to imply presence of a user or that an ad has been viewed/seen. Viewable conditions may occur without the presence of a user in digital (such as in Auto-Play), OTT and linear environments.

That said, there are several requirements discussed in this document as well as the *Digital Audience-Based Measurement Standards* that signal the likelihood that a user is present during associated measured activity including, but not limited to, inactivity rules, session cut off rules, auto-play requirements, continuous play requirements and TV Off controls (all discussed throughout this document). All of these considerations are required for inclusion in audience measurement.

Certain measurement controls such as people meters and other factors such as user initiated sessions and the personal nature of mobile devices may create stronger linkage between ad delivery and presence of a user may also be present. Additional controls that provide additional assurance of presence of user are encouraged and should be disclosed.

3 Cross-Media Universe Estimates – Basis for Projection

3.1 Universe Estimates

Generally, a demographic/geographic universe or coverage definition stated on the basis of population amounts is required for audience measurement. These may be customized (or limited) based on the specific attributes of the measured audience. The source used for such universe definitions must be referenced and shall be from generally accepted independent Industry or governmental third-party sources as well as derived by measurement vendors directly as part of high quality observation or surveys. These figures are critical for the projection of audiences. This data shall be updated at regular periodic intervals and preferably be stated on a basis that corresponds to the audience targets and weighting variables being employed by the measurement organization.

Adjustments to universe estimates such as surveys to update them or obtain more granular estimates than available from generally accepted sources shall be disclosed, supported by

empirical evidence that the collection methodology and collected data is representative of universe being measured, and subject to robust quality control.

The Universe used for calculating a GRP must be based on the total audience or selected demographic/target measured. The Universe must be considered when determining the coverage of measurements (see Section 3.2 below) as well as when projecting measurement estimates. The Universe used in GRP calculations and estimate projections must be appropriate for the measurement and be fully disclosed to users. **For cross-media audience measurement, the minimum acceptable universe shall be the de-duplicated total of all persons in the media universe for each medium or more generally, total persons.**

Use of total US population is required (for US measurement; other countries may be used where applicable) for input into cross-media audience-based measurement, although local market and regional populations are permissible for local reporting. However, in certain component measurement cohorts, specific population subsets may be used such as the Internet population for digital only measurement, the mobile population for mobile-only measurement and the TV population for Return Path or Set-Top-Box measurement. Where a specific population subset is utilized, it is required to project measurement to the total population accounting for access or ability to access within the subset (such as TV or digital access) measured when projecting cross-media measurement. **Population subsets shall never be used to project cross-media measurement.**

As discussed above, household level cross-media metrics are permissible in addition to persons level metrics when both digital and non-digital components utilize the same measurement units. Universes used for cross-media measurement and projection shall utilize units appropriate to the underlying metrics including whether those are on the basis of persons or households. Methods to convert or translate persons or household level Universe Estimates shall be empirically supported.

See the *MRC Digital Audience-Based Measurement Standards* for further guidance regarding Universe definitions.

3.2 Coverage

Audience can be measured through taking samples of persons, consumers and/or devices (including TVs) and projecting the activities of these samples to the population of users and/or devices. This is traditionally known as panel-based or sample based measurement. Herein we reference the *IAB's Audience Reach Measurement Guidelines* as an existing source of acceptable practices for this type of measurement in digital measurement. Additionally, the *Minimum Standards for Media Rating Research*, published by the Media Rating Council, are also applicable to this type of measurement.

For sample-based measurement of any kind, the measurement organization shall be diligent about ensuring valid projections are made and that the sample is representative of the

population targeted for measurement for probabilistic samples or that non-probabilistic samples properly account (via weighting or data adjustment) for inherent biases and are subject to robust quality control. Methods for weighting or adjusting data to ensure projectability shall be supported by empirical study, and these empirical studies shall be updated periodically. Standard errors around sample-based projections shall be disclosed along with the impact of non-systematic error and bias.

Measurement can also be done through census-like counting techniques, essentially tracking instances of consumption through tracking assets such as a JavaScript tag, beacon or application code (such as Software Development Kits and Application Programming Interfaces or SDKs and APIs) for all measurable accesses or by using comprehensive, large-scale data sets. Despite the inference of “census” there are likely to be certain limitations of coverage (incompatible types of players or browsers, excluded technology types, functionality limitations in certain mobile devices, lack of digital or cable access, etc.); therefore, it is important for the measurement users to fully understand the true coverage of the reported estimates and what may be excluded from the measurement organization’s ability to measure. The coverage of, and material limits or exclusions to, coverage of audience measurement are required to be described by the reporting entity.

Limitations in measurement of the intended Universe due to technical limitations of measurement or intentional measurement exclusions, including any that result in systematic biases (for example, non- or under-sampled geographic areas, or non-sampled/measured respondent types), shall be fully disclosed and quantified, where known and quantifiable. As part of this requirement, measurement organizations shall also consider environments where measurement is not permitted such as platforms, publishers, hardware or other environments where measurement assets are either actively restricted, due to privacy concerns or other reasons, or are not accessible by a specific measurement technique. Measurement estimates shall not be projected to adjusted coverage, but instead the Universe intended measurement.

Measurement organizations must periodically assess any measurement limitations and resulting biases including whether they can either be mitigated further or corresponding disclosures shall be updated. Measurement organizations are encouraged to consider additional industry guidelines in this area. Additionally, measurement organizations seeking MRC accreditation are required to adhere to relevant MRC Minimum Standards and the *MRC Digital Audience-Based Measurement Standards* in this area.

3.2.1 Device Identification

Measurement vendors are required to identify devices used to access ads and content including determining device type, platform and operating system. Enumerating audiences by device shall be used as an input into determining coverage of the universe measured. Further, device audience measurement and coverage determinations shall be considered in techniques to account for duplication, as discussed below.

Exclusions of device types (as well as operating systems or versions within device types) shall be described with accompanying estimates of population coverage gaps resulting from exclusions. This shall include, but not be limited to, certain machines, devices, operating systems, browsers, players, television sets, set top boxes, peripherals, etc. that are unable to be sampled or measured or that are otherwise excluded. Where possible, these shall be established with appropriate third-party census data; however, if internally developed, this shall be subject to audit and fully described.

With respect to device identification where large scale data sets are used, vendor users of this data shall obtain regular updates or coverage reports from partners identifying current distribution of devices. Where possible, measurers shall conduct procedures to monitor and detect device types in usage data including monitoring activity trends for each device type/model, identifying when new device type/models are observed and segregating, if possible, new devices until a review of data from device can be performed.

3.2.2 IP-Enabled Television or OTT Devices

For purposes of this document Over The Top or OTT is defined as delivery of digital video to televisions via internet-connected devices (or functionality within the television itself). This includes both IP set top boxes that receive signals from digital video ad servers (and widgets on them) as well as USB and HDMI multimedia devices, connected TVs and gaming consoles that do not require set top boxes or converters. This definition is consistent with that published in the *IAB/MRC Digital Video Impression Measurement Guidelines (Version 1.1)*. OTT does not include linear video or VOD content delivered through digital means via cable head-ends (which would be considered linear TV for purposes of this document), nor streaming of linear content to mobile devices (which would be considered digital video), although this document covers and allows combinations of all of these formats (these definitions are just for report segregation).

Specific limitations of measurement related to OTT device types, platforms and categories or operating systems shall be considered with regard to Universe and coverage and shall be fully described and quantified. Additionally, the presence of OTT devices within a household is very dynamic and requires regular monitoring and updating, with corresponding Universe estimate updates and adjustments. Finally, OTT devices can carry different sources of data (such as separate data feeds from Smart TV manufacturers, streaming content and linear content distributed through applications and Virtual Multichannel Video Programming Distributors or vMVPDs) that may require integration processes. The receivability of OTT devices shall be considered when deriving Universe estimates as well as when assessing measurement coverage, especially when projecting reported results.

See the *IAB/MRC Digital Video Impression Measurement Guidelines* for guidance on specific aspects of OTT measurement such as latency considerations, continuous play and TV Off situations.

3.2.3 Accounting for Duplication Across Media

A user shall only be counted once (de-duplicated through direct measurement or analysis of overlap) for unique measurement, despite the fact that a user can have multiple visits or exposures during a reporting period. Furthermore, in all instances related to the reporting of audience measurement, the use of the qualifier word “Unique,” shall be limited only to references to records that have been de-duplicated within the entire reporting period.

See Section 4.4 for further guidance on technical aspects of tracking users/uniques and accounting for duplication.

4 Cross-Media Measurement Standards – Technical Details

4.1 Tracking of Advertising and Content Access – Technical Details

4.1.1 Client-Initiated (and viewable)

Consistent with the *MRC Digital Audience-Based Measurement Standards*, these standards rely on the central concept that counting of ads and content exposure shall *initiate* on the client side, not the server side and that counting shall occur as close as possible to the delivery of an advertisement or content to the measured user and only when ads or content has been loaded. Server-initiated counting methods (the configuration in which impressions or content are counted at the same time the underlying content is served) are not acceptable for counting ad impressions or content because they are the furthest away from the user actually seeing the ads or content. Measurement counting may happen at the server side as long as it is initiated based on client-side events and measurement assets. However, pass-through methods (where client-initiated measurement is passed to server-side collection) of signaling interactions detected on the client side from server infrastructure are acceptable. See Section 5 of this document for further discussion related to data preparation and quality checking guidance for server-to-server implementations, which are permissible and meet the client-initiated premise.

Measurement that does not meet the client-initiated counting requirements discussed above or does not account for post-buffer and play requirements for a valid Digital Video Ad Impression as described in *IAB/MRC’s Digital Video Impression measurement Guidelines* should be segregated in reporting and disclaimed as non-compliant.

Additionally, non-digital video measurement shall include discrete commercial impression measurement where dynamic delivery models are present as discussed above and apply viewability measurement concepts consistent with those applied to digital measurement as a required input into cross-media audience combinations.

The ad impression measurement requirements discussed above apply to measurement of ads delivered with linear content as well. As discussed earlier in this document, measurement vendors are strongly encouraged to develop impression-level measurement of non-digital video ads, such as those present in linear TV (including VOD and OTT), that involves discrete

commercial measurement in lieu of broader time or program based measurement that serves as a proxy for commercial delivery and are required to do so for dynamic delivery models when measuring and reporting combined and deduplicated cross-media.

While Ad Impressions may be measured in aggregate in cross-media environments, Viewable Impressions are the minimum required qualifying measurement unit for digital audience-based measurement including digital and cross-media Reach, Frequency and GRP. See the *MRC Digital Audience-Based Measurement Standards* for further details.

As Discussed in Section 2.2.1, an Ad Impression must meet certain pixel and time thresholds in order to qualify as a Viewable Impression. **In instances where digital and linear video ad audience measurement will be combined into deduplicated cross-media measurement, it is required that a viewability qualification threshold of 100% of pixels on screen for at least two continuous seconds is utilized for both digital and linear components. Digital components using a 50% pixel viewability criteria may still be reported on a standalone basis and in comparison to linear measurement, as long as the bases for measurement of each measurement is clearly disclosed within reporting. MRC intends to conduct further research as part of potential future updates of the viewability guidelines to determine if digital viewability thresholds should be modified.**

These thresholds are designed to add greater assurance that there was an “opportunity to see” the ad by the user beyond assurance that the ad was properly served and rendered by the device. See the *MRC Viewable Impression Measurement* and *MRC Mobile Viewable Impression Measurement Guidelines* for guidance on Viewable Impressions as well as specific guidance on cross-media combinations above.

The same cross-media video viewability thresholds used for ads shall be applied to content **(100% of pixels on screen for at least two continuous seconds)** in order to qualify as viewable and for inclusion in cross-media audience.

The MRC originally designed viewability requirements to serve as a minimum moment that represented opportunity to see, as well as a qualifier for digital audience, but also designed measurement requirements such that accredited measurement providers must be able to measure time and pixels at a granular level. As such, our expectation is that minimal technical challenges are present regarding a move to 100% of pixels for existing digital components for cross-media combinations.

Additionally, non-digital video measurement such as linear TV shall include discrete commercial impression measurement where dynamic delivery models are present as discussed above and apply viewability measurement concepts consistent with those applied to digital measurement as a required input into cross-media audience combinations. Where ads and content are displayed to a TV (linear or OTT), it may be assumed that the 100% pixel criteria for viewability is met without direct measurement, although time threshold requirements still apply (2

continuous seconds for video) as do considerations related to obstructions, occlusions and TV limitations discussed below.

Consistent with the *MRC Mobile Viewability Guidelines*, cross-media video measurers are required to account for situations of obstruction (situations where a viewing session is partially or fully blocked such as in device alerts or use of channel guides and on-screen navigation) only where material and to the extent technically feasible to determine the in-focus status of measured content. Limitations in the ability to detect certain obstructions or occlusions of measured content shall be fully disclosed with any estimated impact on reported results quantified where material. Capabilities in this area shall continue to be studied related to both impact and technical feasibility of measurement as part of future development efforts, but a general disclosure inclusive of OTT and linear environments meets this requirement.

Certain OTT and STB devices may include dedicated power sources and as a result, may be independent of the power state of the TVs or video display monitors used to display their content. In such environments, video content and advertising may be played while corresponding TV or video display monitors are off. In addition to applying time and pixel thresholds to viewability measurement, measurement vendors must also consider and account for situations where a TV or video display monitor may be off in both digital and non-digital measurement of ads and content displayed on TVs and consistently in cross-media comparisons and combinations.

Current technological limitations make it difficult for a measurer using digital measurement assets or RPD data to detect the power state of a TV or video display monitor in all situations. Measurement vendors shall consider this limitation as well as its effect on measurement of video and clearly disclose it as a general limitation. In addition, measurement vendors shall make efforts to identify and account for TV off conditions using empirically supported techniques such as modeling.

The impact of this limitation tends to overreport viewership by collecting and reporting tuning data that was not displayed on the connected television. While the impact of this limitation can be somewhat mitigated by inactivity rules (discussed later in this document) and continuous play cut off enforced by OTT platforms or video providers (see the *IAB/MRC Digital Video Measurement Guidelines* for further information). In some cases, the overreported tuning can be significant, such as a powered-on STB device delivering content to a television that is powered-off for days. The direct use of RPD for television measurement that does not account for this will result in material bias in overreported television audiences. Any measurement service that utilizes STB data for television audience measurement needs to properly account for and adjust this overreporting in order to be accurate.

4.1.2 Audience vs. Ad Measurement

As discussed throughout Section 2 earlier in this document, measurement of digital advertisement delivery and content audiences are generally performed separately, versus the generalized measurement orientation that currently exists for legacy television media (inferring

the same audience to the content and advertising). It is critically important that measurement organizations consider varying types of content and advertising delivery models when they are establishing measurement and reporting.

As discussed previously in this document, these standards recommend that measurement occur in a way that allows for the most discrete measurement of the audience as well as advertising contained within content as is possible, in consideration of the advertising model employed and the characteristics of the technology used to deliver the content. For dynamic ad and content models discussed earlier in this document, audiences for ads within the content shall not be inferred based on measurements other than those that measure each discrete ad occurrence (impressions and viewable impressions) for combined and deduplicated cross-media video measurement. See Sections 2.1.2 and 2.2.3 of this document for further details related to segregation of ads and content.

Overall, for simplification purposes, it is desirable (but not required) for the same technical implementations to measure both audiences and ads wherever possible. Technical implementations that facilitate measurement (tracking assets, etc.) may vary between audience and ads because of differences in the type of decisions being made by measurement data users. For example, content audience measurements may be oriented to provide “planning” types of inferences to buyers as to the size, location, demography, Reach and Frequency, types of users attracted to the content, how the content is accessed, time spent, device/user behavior tracking, and longitudinal device/user movements across content. Planning metrics are generally stated on the basis of a specific time period or content (such as episode or program).

Measurement for advertisement delivery (meaning an Ad Impression or Viewable Impression) represents a counting orientation with audience assigned Reach and Frequency of discrete exposure to the advertisement. Both unassigned delivered ad metrics (total), audience assigned ad metrics (in-target) and metrics related to content could be subjected to discrete Gross Rating Point measurement, assuming proper granularity of tracking assets and audience assignment methods. In cases where the measurement does not rely on a full census orientation, measurement at a local level may be challenging because of sample size and/or data quality considerations (quality considerations may include coverage, representation of the population being measured, data loss, bias, etc.).

Consideration shall be given to the sufficiency of sample sizes and/or data coverage adequacy in development of ad delivery and planning metrics. These metrics shall be filtered to exclude invalid digital traffic. These metrics shall be counted using client-initiated counting to ensure that the ad and/or content have actually been loaded and presented to the user.

4.1.3 Script-based Tracking Method/Assets

From the *MRC Digital Audience-Based Measurement Standards*: For digital measurement of advertising, measurement methods may include a tracking asset such as a tag. The existing various IAB/MRC digital measurement guidelines as well as the *MRC Digital Audience-Based Measurement Standards* contain details and guidance of script-based tracking methods and

measurement via tags. Most digital environments including many digital delivery systems of linear content (such as OTT and IP-enabled STB environments) can be measured via these assets. Tracking of advertising via script-based methods and assets shall adhere to the guidance and standards referenced above. Additional guidance related to script-based methods for video, within mobile applications and as it relates to server-to-server architecture is discussed in further detail throughout this document.

As discussed above, overall, for simplification purposes, it is desirable (but not required) for the same technical implementations to measure both audiences and ads wherever possible.

4.1.4 Encoding or Watermarking, Fingerprinting and Meter-based Tracking Method/Assets

In addition to the tracking assets discussed above, measurement of ads and content may also involve embedding assets in some fashion to inject additional metadata or information such as encoding and watermarking or the creation of audio or video signatures based on fingerprinting sources and libraries. Encoding or watermarking involves the process of putting a special code or unique identifier, often a sequence of characters (letters, numbers, punctuation, and certain symbols), into a specialized format for efficient transmission, storage, privacy protection, security or measurement. Signature matching or fingerprinting involves the creation and collection of condensed audio or video digital summaries of ads or content to serve as source libraries for crediting of media consumption.

These techniques can be proprietary to a measurement vendor or commonly available such as Ad-ID[®] and the Entertainment Identifier Registry (EIDR) which represent unique ID layers. Additionally, media may be analyzed for specific signatures to develop fingerprinting and corresponding matching techniques. These identifiers or assets shall be separate from the hardware ID of the device (i.e., MAC address, IMEI or IP address) and have sufficient granularity to ensure uniqueness for measurement purposes. Coverage of these identifiers will not be complete, so additional sources may be necessary. Additionally, these identifiers must be propagated throughout the ecosystem to be effective along “detectors” or decoding methods to identify and interpret them.

Encoding (vendor specific or commonly available), signature matching or fingerprinting is strongly encouraged for effective cross-media measurement. Specifically, adoption of common asset identifiers across media types facilitates seamless accumulation of total campaign activity for a particular advertisement/creative.

Further, certain script-based techniques such as tracking via player integration, may involve some level of encoding in addition to scripting. For example, the IAB’s Video Ad Serving Template (VAST) has historically provided a placeholder for a creative ID and in version 4.0+ this placeholder is a UniversalAdID element, which is required for linear ads in long-form video and enables all data associated with the creative to flow across systems.

Hardware and software meters may also be used to track digital ads and content and may include meters specifically designed to decode and capture exposure to encoded content, capture fingerprints for signature matching or to track and measure traffic regardless of whether such traffic is encoded. Meter measurement is most often accomplished via recruitment of participants for ongoing measurement as part of panels, which may be recruited using either probabilistic (proportionate to the universe measured) or non-probabilistic (such as in opt-in or convenience panels) methods.

Regardless of method chosen, the measurement organization that originates the tracking method/assets shall seek to impact the quality of the programming, advertising and user (consumer) experience as little as possible – minimizing latency, video or audio interference or noise, distortion, etc. Assuming adequate coverage and quality, more passive techniques to the practitioner and user/consumer are preferred to active techniques that require consumer interaction with tracking interfaces.

Multiple sources shall be utilized to identify both timing and content of programs/ads. When discrepancies in reporting are detected, more manual verification technology can be utilized. It is important to have direct contacts at networks/stations to obtain confirmation for what is being provided by metadata providers, listing services, etc.

The *Minimum Standards for Media Rating Research*, published by the Media Rating Council, are applicable to this type of measurement methodology. Specifically, use and maintenance of encoding, unique identifiers and metering solutions must include:

- Robust quality control in design and maintenance of technology and algorithms used with empirical support for any assumptions or parameters applied.
- Initial and ongoing detailed designed lab testing including simulation of the intended measurement environment and any potential challenging environmental factors (such as introduced interference, device types, compression, anti-virus software, etc.) to gauge survivability.
- Robust quality control over encoding data source or reference construction (ad, content, program, page, domain network, channel, etc.) to enable crediting of exposure.
 - These controls shall include assessments of both encoding and decoding effectiveness.
- Consideration of and minimization of any user or respondent impact such as distortion or interference introduced by encoding or performance impact on metered devices.
- Consideration of encoding or metering granularity (at least second level granularity preferred for duration, although crediting can be on less granular levels such as minute level as long as cross-media combinations include the same crediting basis); activity measurement must be granular enough to segregate ad types and media within campaigns as well as ads from content for input into audience-based reporting. Periodic collection or transmission of measurement data does not need to be as granular as actual measurement (data may be batched for efficiency). **Measurement events shall**

have sufficient fidelity (to the second or millisecond) and that measurement must account for session cutoffs, inactivity, channel changes, etc. Measurement that purports to approximate second level granularity via less granular measurement and collection methods such as periodic polling, state changes or encoding insertion and decoding that occur less frequently than every second, is only permissible with empirical support that clearly demonstrates second level accuracy within immaterial tolerances. Editing and smoothing rules used in crediting shall be supported, quantified and disclosed. Rounding to the nearest whole number is permissible with clear disclosure.

- Consideration of intended measurement environments and relative coverage, as well as any limitations (including any that result in systematic biases) in measurement of the intended Universe, such as due to technical limitations of measurement, shall be fully disclosed and quantified as discussed in Section 3.2. Measurement organizations must periodically assess any measurement limitations and resulting biases. Measurement organizations are encouraged to consider additional industry guidelines in this area. Additionally, measurement organizations seeking MRC accreditation are required to adhere to relevant *MRC Minimum Standards* in this area.
- Continual monitoring and analysis of collected meter data for potential consideration of downtime, bugs, compatibility issues, emerging limitations, errors and defects for support of meter updates and maintenance.
- Consideration of similar continual monitoring over reference data collection. Processes used to monitor TV content assets and advertising content assets to build reference libraries shall also have consideration of national networks and local stations as appropriate given advertising may exist at the local level, including national programming content with commercial pods available for local overlay (e.g., situations in which cable providers may overlay locally sold commercials over the nationally aired commercials).
- Polling (where applicable) and transmission of data that is appropriately granular and frequent for the intended measurement and incongruence with any applicable requirements (such as in viewability polling requirements).
- Sufficient (time and size) memory and caching to ensure collected data is complete and able to be stored locally to allow transmission of collected data.
- Management of versioning to ensure encoding and equipment is the most up to date as well as efforts to reduce the impacts of multiple versions in production.

4.1.5 STB, RPD and Smart TV data

Cross-media video measurement may involve the use of Multichannel Video Programming Distributor (MVPD) return path data (RPD), or other forms of large transactional data sets such as Over the Top Television (OTT), Smart TV activity or page tagging information and/or the integration of these large transactional data sets with existing measurement products.

In this context, large transactional data sets represent those data sources that capture media or advertising consumption information or other relevant media activity at the occurrence level

based on passive electronic data collection, but they are typically missing population elements or types of activity (for example, missing individual MVPDs, over the air households, missing individual Smart TV types or sites that do not adopt digital page tagging) and accordingly they require significant adjustment to produce representative estimates. **Large transactional data sets typically do not represent true census data sets.**

If large transactional data sets are utilized on a stand-alone basis as the sole measurement source, the requirements of assessments of quality and completeness and requirements for establishing the accuracy of certain calibrations of the data are highly critical, especially if they are being represented as being projected to marketplace audience behaviors. In general, absent appropriate data adjustment, cleaning, quality control and validation processes, these large transactional data sets cannot be accredited by the MRC on a stand-alone basis.

In addition to the *Minimum Standards for Media Rating Research*, two existing MRC guidelines are relevant to these emerging areas: (1) *MRC's Guidelines for Data Integration*, and (2) *MRC's Return Path Data Accumulation Guidelines*. Additionally, MRC authored certain other supplementary documents on these subjects that can be found at www.mediaratingcouncil.org, one particularly relevant paper is "On Probability Sampling, Babies and Bathwater." MRC and MRC-engaged CPA firms will use these documents as a source of compliance requirements (in addition to the below modifications) for accreditation proceedings in these areas.

4.1.6 Video Usage

A valid digital video ad impression may only be counted when an ad counter receives and responds to an HTTP request for a tracking asset from a client. The count must happen after the initiation of the stream, post-buffering, as opposed to the linked digital video content itself. Specifically, measurement should not occur when the buffer is initiated, rather measurement should occur when the ad itself begins to appear on the user's browser (begins to play). See the *IAB/MRC Video Impression Measurement Guidelines* for further guidance.

While non-digital video ads, such as those present in linear TV (including VOD and OTT), may not necessarily involve HTTP requests or ad servers, except in the case of dynamic ads served as part of addressable TV or as part of vMVPD delivery, non-digital video ads should still be counted at the client side via measurement at the set during playback of the ad adhere to other guidance for impression counting in the *IAB/MRC Video Impression Measurement Guidelines*.

4.1.7 Measurement in Applications

The application measurement organization shall have sufficient controls to determine that:

- The application was downloaded, opened and initialized on that Client User prior to the measured Session.
- The application itself (or measurement assets within it) was functioning as intended during the session by examining data received for completeness or signs of corruption. Sessions and exposure metrics associated with "faulted" conditions (situations of

functionality issues with the application, errors or non-working conditions) shall be tracked and segregated from fully functioning Sessions and Ad Impression metrics

Application transaction records, which contain evidence of exposure, can be derived and transmitted to the application measurement organization: (1) on a real-time basis during application execution, (2) in batched groups that are transmitted periodically (in whole or in part) during an on-line application Session or, (3) first stored during off-line application use and later transmitted during a subsequent on-line Session (not necessarily associated with the same application) of the applicable Client-User. Deferred exposure or impressions shall be credited to time of exposure, not based on transmission or collection time.

In certain cases, mobile applications may be configured to “Pre-load” ads (generally full-screen interstitials) whereby open and active applications load ad assets, but the app determines if the ad is shown at a later time (or if at all) such as upon specific user interaction or engagement. Pre-load requests do not qualify for measurement as a valid rendered impression unless ad content has been loaded on response to a request by a user. However, such Pre-loading may be indistinguishable from user-driven ad requests.

As such, a measurement vendor shall only count these ads (pre-loaded in-app interstitials) after execution of the last part of the application code that checks for a pre-loaded ad and then if present, chooses to display it, if known. Alternatively, pre-loaded interstitials shall only be counted when displayed/visible. See the *IAB Mobile Application Measurement Guidelines* for further guidance regarding measurement in applications. Non-rendered pre-loaded in-app interstitials shall be filtered as invalid or otherwise not counted as impressions.

4.1.8 Repurposed TV Content

As previously discussed in Section 2.3.3, these standards permit the measurement of repurposed TV content using certain currently existing metrics, assuming the same advertising load and positioning is preserved in this content. For example, using metrics that average exposures on an average time basis such as average minute audience and average quarter hour audience may be used in these common ad-load scenarios. This commonality of metrics allows for the combination of exposures across platforms.

However, if the repurposed TV content carries different advertising or dynamically inserted advertising, then the metrics required herein for cross-media comparisons shall be used – these are impression based, for discrete commercials or content, or at minimum they are for the average minute containing the unique commercial.

4.1.9 Comparative Presentation

A key concept being introduced in these cross-media standards is the “syndication of content measurement.”

In certain media types measurement has been developed on a client by client basis, i.e., the measurement results are only exposed to that client or the customer of that client by the client, not the marketplace in total. This approach is considered non-syndicated.

Cross-media comparisons of content measurement shall be established on a syndicated basis – that is, measurement shall be shared across all media outlets. This involves measurement organizations producing standard reports that essentially rate all media outlets, not solely one organization for proprietary uses. Measurement organizations shall make efforts to produce comparative presentation of audience activity across all properties measured, in addition to individualized client reporting, with the coordination and permission of publishers.

There may be cases where publishers wish to preview private data prior to inclusion in syndicated reports or they may outright prohibit syndicated reporting (e.g., they will not tag or provide server to server data if the results will be published in syndicated deliverables). In these cases, the measurement service shall solicit their participation and aim to develop syndicated services, but otherwise can forgo their inclusion and disclose the limitation to syndicated reporting. If these exclusions are deemed material, estimates of impact shall be actively disclosed.

We are stating no such requirement for advertising measurement, where non-syndicated measurement may continue, however we would encourage development of tools such as competitive media reporting to assist advertisers in understanding the advertising activities of other organizations.

4.2 Duration

Duration measurement shall be based on second-level granularity, although crediting can be on less granular levels such as minute level as long as cross-media combinations include the same crediting basis. **Minute level crediting shall apply discretely to content or impression level reporting (i.e., exact commercial minute, not averaged among differing placements such as in average minute audience except where permissible as discussed below) and be on the basis of at least second level measurement granularity. Measurement events shall have sufficient fidelity (to the second or millisecond) and that measurement must account for session cutoffs, inactivity, channel changes, etc.**

Combined and deduplicated cross-media video measurement that purports to approximate second level granularity via less granular measurement and collection methods such as periodic polling, state changes or encoding insertion and decoding that occur less frequently than every second, is only permissible with empirical support that clearly demonstrates second level accuracy within immaterial tolerances. Editing and smoothing rules used in crediting shall be supported, quantified and disclosed. Rounding to the nearest whole number is permissible with clear disclosure.

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Records evidencing longitudinal consumption (duration) during the measured time period shall be based on active user affirmation, or at minimum periodic confirmation with the device that ads or content continue to be delivered. Such periodic confirmation may also be accomplished via the use of periodic beacons or “heartbeat” pings.

Time spent or duration may be measured with regard to certain progress events such as completions, quartiles, deciles or some other segmentation of video ads or content. Duration measurement for ads shall be based on at least second granularity. Progress events alone shall not be used to accumulate time for purposes of duration. The use of progress events for completion of video content (and contribution to duration) requires continuous measurement and second granularity confirming exposure to the entire segment measured before credit can be reported.

When operationalized, there may be technical challenges associated with tracking and incorporating duration across media environments discretely and accurately, such as non-uniform ad units within a campaign, lost and missing data, delays and lags between player time and measurement, as well as “trick” functionality such as fast-forward, rewind, skip and pause. Measurement vendors collecting and reporting duration signals and metrics shall be aware of and account for these challenges, however, MRC believes these challenges are adequately accounted for in guidance contained in this document related to duration, granularity, data editing and quality control, as well as previously issued guidance such as that contained with the *IAB/MRC Digital Video Measurement Guidelines*.

The maximum allowable credit of viewable duration for any one exposure or session is the creative length, representing completion.

Inability to measure and report duration metrics due to permissible less granular reporting (such as linear advertising and use of content time as a proxy for ad delivery) shall be actively disclosed. Duration shall not be inferred when not directly measured.

4.2.1 Inactivity

Measurement organizations shall institute specific “inactivity rules,” by which a user session is terminated and thus excluded from additional contributions to duration after a pre-determined level of consecutive inactivity or based on dynamic logic with empirical support. These inactivity criteria shall be fully disclosed, and it is expected they may be modified in the future based on evidence from empirical study of the evolution of users’ habits within specific media environments. See the *IAB Mobile Application Measurement Guidelines* for specific guidance related to inactivity rules in mobile applications.

4.2.2 Duration Editing

Certain organizations may have edit rules in place that bridge gaps in user activity within a session, if they occur within a certain time frame (including ascribing missing progress events).

Such edit rules and data adjustment shall be empirically supported and disclosed to users with appropriate quantification of impact on reported results.

4.3 Tracking of Users (Sources and Attribution) – Technical Details

The threshold of measurement difficulty for achieving user or persons-level measure in a census-based environment is quite high (generally because of the difficulty of being able to identify a cookie, advertising ID or device as a unique person persistently during the measurement period). The measurement organization may utilize algorithms and other data adjustment procedures, utilizing means such as cookies, as well as other possible identification methods such as online or offline studies, to calculate unique browsers or devices. However, in order to report at the user or persons level, the measurement organization must utilize in its identification and attribution processes underlying data that is, at least in a reasonable proportion, attributed directly to a person.

In no instance may a census measurement organization report on a user or persons basis purely through algorithms or modeling that is not at least partially traceable to information obtained directly from people, as opposed to browsers, devices, or any other non-human element. Training sets shall be based on real behavior at the individual persons level as opposed to devices.

The highest form of direct assurance for persons level measurement is on a first-party, opt-in basis where users have provided or confirmed their personal details or demographics, a subset or all have been validated through direct interaction or correspondence and their media consumption is verified and attributed via credentials or compliance mechanisms on an ongoing basis. It is understood that such assurance representative of the media universe at scale may be difficult and costly and as a result these Standards, the *MRC Digital Audience Standards* and the *IAB/MRC Audience Reach Guidelines*, provide guidance for various methods of deriving persons level measurement without complete first-party measurement. Short of direct assurance of persons (which is preferred), capabilities and limitations related to methods to derive persons and assumptions applied therein shall be periodically studied and disclosed to users.

As discussed above, large scale, passive data sets may be incorporated into cross-media measurement in order to measure media consumption at scale. However, many of these data sets do not include persons level or otherwise identifying information and require overlaying of other data to approximate persons level measurement. This is permissible within these Standards and is subject to further guidance related to data matching, editing and adjustment. However, wherever possible, direct persons level measurement is preferred for combined and deduplicated cross-media video measurement. This applies in digital where media consumption is often personal on individual devices, but even in linear media where consumption is increasingly individualized. Further, adjustment of audience to project raw media exposure to account for persons such as in co-viewing extensions, must be based on rigorous, empirically supported and auditable methods with some meaningful component based on directly collected deterministic persons measurement.

Additionally, adjustment factors that utilize persons level overlay data to project audience for device level media consumption measurement are less accurate than direct persons level measurement. Such techniques must be clearly disclosed, empirically supported and error associated with them must be provided in a prominent manner.

Panel-based measurement organizations may track panelist audience activity and/or rely on their own attribution techniques (logging, database matching, activity analysis such as people metering compliance and qualification, etc.) to determine the identity of a specific panelist. These records will be accumulated for websites, channels, stations, ad exposures or properties and projected/weighted to totals. Panel-based measurers, have an obligation to study the effectiveness of their attribution techniques periodically.

These organizations may have complex methodologies for selecting, recruiting, coaching and maintaining panels (or other methods of user-attribution); collecting data; editing, projecting and weighting data and reporting audience activity. A strength of these organizations is the ability to attribute audience activity to persons directly and the known demography of users in a panel or some other user-attributed data source. This information is gathered through a combination of manual and automated techniques, some of which can involve direct contact with panelists and some involve use of software metering techniques or other data collection devices.

Similar to census-based measurers, the quality of the user attribution process (logging, activity assessment, etc.) is critical to the measurement accuracy. Additionally, the *MRC Digital Audience-Based Measurement Standards* contain guidance related to technical details for panel-based measurement and cross-media measurement providers are expected to comply with that Standard.

4.3.1 Adjustment of Uniques

The *MRC Digital Audience-Based Measurement Standards* contain guidance related to technical details for adjustment of uniques and cross-media measurement providers are expected to comply with that Standard.

4.3.2 Identifying Users Across Devices

A key benefit of cross-media measurement is the development of metrics for unduplicated reach across platforms and devices. This is, unfortunately, a very difficult area of measurement due to the need to track users and activity across often disparate data sets, enterprises and/or hardware/operating system structures. The practice around this area of measurement is relatively undeveloped and faces legitimate privacy challenges from regulations such as the European Union's General Data Protection Regulation (GDPR). The need for this type of tracking to establish unduplicated reach is real and necessary, so we expect continued innovation to enable these valuable metrics.

Given the developing state of practice, this document focuses on general concepts that are preferred in this area, rather than seek to mandate methods. The following general concepts are critical to valid, effective and reliable deduplication efforts for audience reach:

- Deduplication efforts shall be considered for advertising as well as content-measurement products.
- The measurement organization shall develop appropriate empirical support and base-research for establishing the validity to methods of deduplication chosen. This support shall be updated periodically as audience behavior and data availability may change.
- If deduplication methods are based on subsets of activities (persons with certain devices or attributes), empirical evidence must include propriety of projection methods and applicability to the media types being measured. Deduplication methods cannot be solely based on modeled data, with no support or access to actual consumer duplication information gathered as a “learning set” or “truth set.”
- Deduplication processes and rates are likely to vary by device, media type, etc. These differences shall be considered, and this fact further emphasizes the dynamic nature of the calculation/model, which needs to be updated frequently.
- MRC has produced guidance on “uniques” metrics contained in the Digital Audience Measurement Standards; the standards shall be followed when producing the base for deduplication processes – the measurement organization shall apply deduplication processes to valid unique user estimates.

Certain identifiers are considered of insufficient quality, granularity or stability to form the basis of developing audience-based “uniques”, such as IP address. Base data quality shall be assessed for inputs into the development of unduplicated reach metrics.

The MRC encourages industry study of appropriate methods for deduplication of audiences and tracking assets that preserve consumer privacy, while facilitating accurate measurement. A universal identifier for people would be an ideal mechanism, but we realize that this may be a difficult structure to achieve in today’s complex privacy environment, and with the overall sensitivity consumers and regulators may have toward tracking.

4.3.3 Data Enrichment Source Selection

A critical component of cross-media measurement is the assignment of audience characteristics to ad or content exposure information. Generally this is accomplished through a data enrichment process, modeling or assigning transaction information to identity information from an independent data source (enrichment provider). There are several critical processes and control areas necessary to select and maintain a data enrichment source:

- Data Source identification and changes to source (with timely disclosure)
- Completeness and coverage of the data source, by data variable
- Accuracy information based on periodically updated empirical support
- Testing and quality control of data transfer from DEP source

Final

- Privacy considerations
- Assessments of adjustments, if any, that need to be made to the integrated source data
- Processes for on-boarding and terminating data sources, as well as disclosing these types of changes to service customers

Disclosures related to data enrichment process:

The sources of assignment data as well as data sets involved in data integration processes shall be disclosed to measurement service customers in the description of methodology with consideration of protection of proprietary third party provider methodological details. Changes to these assignment/integration sources shall be reflected in customer disclosures on a timely basis. Relevant information to include in methodological disclosures of this type include the following:

- Data Source Organizations
- Frequency of Execution of the Assignment or Integration Processes
- General Description of the Assignment or Integration Methodology
 - A Description of Empirical Support for Methods Chosen; Frequency of Validation Procedures Employed with Latest Validation Results Summarized
- Ultimately Reported Data Elements, by Source Data Set
 - Descriptions of Methods of Collection of Significant Data Fields (e.g., registration or directly gathered, collected from other third-parties)
- Approximate Age of Data Being Used
- Key Linking Data Elements or Integration Dependencies
 - Common Definitions of Linking Data Elements – Definitions shall be Sufficiently Comparable and Preferably Identical
 - Extent of Ascription Applied to Data Elements, Pre-Assignment or Integration where known
 - Extent of Modeling or Other Inferences Made to Data Fields
- Known Population Exclusions from Data Sets Used
 - Magnitude of Exclusions, Where Known
- Key Assignment or Integration Performance Indicators
- Size of Applicable Data Sets in Terms of Relevant Attribute (Households, Persons, Media Devices, Activity Records, etc.) where permissible
- Nature of Data Overlaps or Commonalities Between Relevant Data Sets where permissible
- Extent of External Auditing or Verification Processes Employed

There are specific areas of the *MRC Digital Audience Measurement Standards* that shall be considered when developing deduplicated reach metrics. Specifically, the following areas shall be considered:

- Data enrichment methods (section 4.3.5.1)

- Data enrichment quality checking and monitoring (section 4.3.5.2)
- Further considerations on the use of registration data as a source (section 4.3.6)

4.3.3.1 Data Enrichment Quality Checking and Monitoring

Quality control extends to understanding the data sources, custody and general processing details (for example, pre-transfer data changes or editing applied, definition of fields transferred, age of the data) of any large transactional data sets integrated into rating service measurement. It is critical that when data or processing procedures change within upstream data sources, the rating service identifies these changes and adjusts its down-stream processing on a timely basis. This knowledge can be obtained (and updated over time) through periodic direct contact with the data source(s), integrated systems testing/monitoring, or separately maintained lab testing using the source equipment, or, preferably, a combination of these methods. In these areas, procedural consistency over time is critical and considered an aspect of quality control.

A higher level of oversight may be required for data sets not accredited by MRC when compared to data sets accredited by MRC. Given MRC accredited data sets would have already undergone audits to confirm data collection and processing quality controls are in place and data is delivered, aggregators and MRC itself will have a level of comfort regarding the further use of those data sets.

4.3.4 Registration

The *MRC Digital Audience-Based Measurement Standards* contain guidance related to technical details for use of registration data and cross-media measurement providers are expected to comply with that Standard.

5 Data Preparation and Quality Checking

This section heavily references the *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines*, the *MRC Digital Audience-Based Measurement Standards* and the *MRC Guidelines Concerning Data Integration* and cross-media measurement providers are expected to comply with guidance contained in these documents where applicable, specifically considering the following areas:

Data Sources and Attributes

- Data Source Selection and Qualification
- Understanding Data Fields, Definitions
- Data Quality Assessments – Source and Field Levels
 - Age of Information
 - Accuracy Expectations
 - Frequency of Updating
 - Frequency of Change
- Determination of Data Relevant for Linkages and/or Reporting
 - Empirical Support

Final

- Validation

Ingestion and Maintenance of Relevant Data

- Gathering of Trending and Monitoring Statistics by Source
- Completeness and Accuracy of Changes Applied by Source
 - Scheduled Frequency, etc.
- Maintenance of Data Quality Conclusions

Data Resolution, Assignment/Linkage and Appending Processes

- Establishing and Adjusting Resolution and Linkage Processes
 - Empirical Support for Processes and Algorithms
 - Statistical Assessment of Probabilistic Structures and Associations
 - Outcome Testing
 - Data Mapping, Transfer Coding
 - Match, Merge, Entity Resolution
 - Reference Data Sources and Accuracy
 - Priority of Data Sources
 - Validation
- Application of Procedures
 - Internal Quality Controls

Linkage and Underlying Data Adjustment and Correction Processes

- Sources of Actionable Information
- Ongoing Maintenance Procedures
 - Current, Historical
- Internal Quality Controls

Data Accumulation and Reporting

- Variable Selection and Reporting Granularity
 - Consistency with Privacy Guidelines
- Presence of Methods Disclosures and Boilerplate
- Pre-Issuance Inspection
 - Data Trending
- Customer Feedback, Considerations, Adjustments

Disclosure Requirements

- General
- Accompanying Reported Data
- Error Correction and Reporting

Information Technology Controls

- Data Access Controls
- Systems Development Life-Cycle

- Business Continuity

5.1 Data Collection

Throughout this document, cross-media measurement providers are either encouraged or required to capture at least second-by-second and ad focused data, including across STB, RPD and Smart TV environments. The *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines*, the *MRC Digital Audience-Based Measurement Standards* and the *MRC Guidelines Concerning Data Integration* contain guidance related to technical details for data collection and cross-media measurement providers are expected to comply with guidance contained within these documents where applicable.

5.1.1 Validation Procedures

Measurement providers utilizing STB data or other hardware meters must take steps to adequately ensure capture and reporting of tuning events of all durations, including consideration and potential impact of exclusion of short duration tuning events (edit rules may be employed that discard or exclude short tunes believed to be invalid where this belief is based on empirical support and has auditable and demonstrable evidence of immaterial impact or bias). Use of universal reference clocks is encouraged and robust procedures shall be in place for consistent monitoring and correction for meter or STB clock drift. Controls shall be implemented to determine whether server and meter or STB clocks are in continuous synchronization, and the results of these synchronization checks shall be reviewed. Given erroneous time stamps within tune event data would have a direct impact on reported data, services shall consider the robustness and the level of granularity of their synchronization checks in this regard including comparing ad tracking/ad timestamps from the same hardware source to assure clock consistency or an auditable way to align clocks, as well as capture of broadcast and home-networking latency.

The *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines*, the *MRC Digital Audience-Based Measurement Standards* and the *MRC Guidelines Concerning Data Integration* contain guidance related to technical details for data collection, and cross-media measurement providers are expected to comply with guidance contained within these documents where applicable.

5.1.2 Quality control and oversight of MVPD STB/RPD data

Data aggregators should strongly encourage their MVPD and Smart TV data services to be MRC accredited (or otherwise certified), which provide assurances that vendor data is prepared in material compliance with the *MRC Minimum Standards* and *MVPD Guidelines*.

As it relates to an aggregator's considerations regarding the level of oversight required over STB/RPD/Smart TV data sets ingested into their service, a differing level of oversight may be required for data sets accredited or certified when compared to data sets not accredited or certified. Given accredited or certified data sets would have already undergone audits to confirm data collection and processing quality controls are in place and data is delivered as

required by the MVPD Guidelines, aggregators will have some level of comfort regarding the use of those data sets. However, regardless if the data set is from an accredited or certified data set or not, data aggregators have certain obligations in order to take ownership of data that are a direct input into their syndicated service. These include:

- Deep insight into STB/RPD/Smart TV data collection, processing, quality control and delivery steps. This includes a deep understanding of the data set limitations and working with the service to continually improve collection of tune data.
 - For unaccredited or uncertified data sets, given a third-party has not performed procedures to assess the service’s internal controls related to the data set, the aggregator shall gain a deeper insight into the service’s internal controls as part of the onboarding process and perform ongoing assessments.
 - Aggregators shall develop questionnaires in order to walk through and assess processes related to the service’s procedures including, but not limited to, the following areas:
 - STB/RPD/Smart TV data collection and processing steps, including QC processes
 - Known technical limitations of the measurement and data collection process
 - Insight into time-shifted viewing measurement
 - Method to identify and disclose non-responding STBs/Households
 - Clock synchronization processes
 - Tune events not meeting minimum thresholds
 - Understanding of the service’s manual vs. automated processes and controls
 - Formal documentation of processes
 - Adequate manuals covering personnel responsibilities
 - Understanding of any aggregation of third-party data into the data set prior to delivery to the aggregator
 - Data retention policies
 - STB/RPD/Smart TV data processing, including editing and quality control processes
 - Disclosure items that the aggregator would need in order to comply with the *MRC Minimum Standards* and *MVPD Guidelines*
 - Controls to notify the aggregator of changes to methodology or measurement and reporting system updates – services shall formally document the communication protocol they require of data vendors (agent processing) when vendors implement process changes impacting the respective vendors' data.
- Robust lab testing prior to integration of data set into syndicated product, to obtain a detailed understanding of the data set in order to design adequate processing steps during the ingestion process.

- Labs shall be geographically distributed to capture market level factors
- At this stage the data aggregator shall verify trending and identify potential issues with the data not reflecting what is intended
- This process can result in several iterations – each one producing adjustments, corrections and/or clarifications with the data provider
- RPD data has many elements that originate from human input and shall be verified for accuracy.
- Routine lab testing to confirm data is received as anticipated and processed through aggregator’s steps as designed.
 - Once in production, closely monitor the data to detect and understand changes
 - Monitoring must include end-to-end coverage – from raw data to final output
 - Trending/monitoring must be done on various dimensions of the data not just transactional volume.
- Lab validation considerations shall also include:
 - Adequate coverage of given STB/Smart TV model universe
 - Adequate coverage of STB/Smart TV functionality and robust scripted testing to ensure data is received as expected and then subsequently processed as expected by the aggregator (i.e., confirm edit rule design)
 - Lab testing shall also consider evaluating impact of new features and functionality with devices, detecting data changes originating with the data provider and confirming schedule and channel lineup changes
 - Test data must be compared to output data at all stages of processing, from raw incoming data through to finalized reported data
 - Noted testing exceptions shall be tracked and discussed with data providers

5.1.2.1 Oversight and QC over audience data vendor processes (STB validation)

Measurement organizations shall meet periodically with data vendors and consider any changes in the vendor’s measurement processes for purposes of validating whether their oversight is sufficient. Measurement organizations shall have an appropriate level of oversight over their vendors’ internal controls to provide reasonable assurance that data is derived solely from subscriber initiated tuning activity and that the captured data is not lost or altered unintentionally. Additionally, subscriber opt-outs shall be excluded where applicable, but any material impact or bias resulting from their exclusion shall be considered and disclosed.

The *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines* contain guidance related to technical details for STB tune validation and cross-media measurement providers are expected to comply with guidance contained within this document where applicable.

5.1.2.2 Channel lineup considerations

Channel lineup errors may result in systemic crediting issues in reported metrics if utilized in processing. Reasonable controls shall exist to ensure these records are accurate and current, including those related to the creation and maintenance of the channel line-ups. These records

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shall emanate from the channel line-ups as applied by the MVPD server technology (Digital Network Control System or DNCS). Use of MVPD billing systems is likely insufficient as customer records aren't as accurate as the DNCS delivering the feed and may also contain personally identifying information.

Channel lineups may be subject to highly manual processes and as a result, include a material degree of errors. Measurement users of channel lineups shall utilize multiple sources and analytical procedures such as channel activity trends by MVPD or headend to apply robust quality control to channel lineup data.

5.1.2.3 Program lineup considerations

Cross-Media measurement providers shall perform quality control processes over the creation and maintenance of program name line-ups, as those may be overlaid with channel tune results to assign credit to programming activity. Scheduled program lineups may differ from actual aired content and as a result, special consideration shall be given to protocols related to live events as well as late changes in program start/end times, etc. It is likely several sources and partnerships with video content providers will be required to adequately ensure accuracy of program lineups.

The *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines* contain guidance related to technical details for program lineup considerations and cross-media measurement providers are expected to comply with guidance contained within this document where applicable.

5.1.3 Server to Server or API integrations

Server-Side Ad Stitching and Server Side Ad Insertion or SSAI (can include Stream Stitching, Video Pre-Loading or Ad Stitching) is defined as the use of an intermediary server to insert ads dynamically into video streams on the server side or directly embedding ads into video content prior to content delivery. This infrastructure is common today to certain OTT and linear video environments (including delivery via vMVPDs), but also is becoming increasingly prevalent in digital video ad serving. In server-side ad stitching, the player may not be able to process discrete ad tracking, and the ad-stitching service may not be able to access cookies used in traditional client-side tracking. Instead, the ad-stitching service must identify devices where ads play by utilizing a combination of other methods.

When an ad-stitching service is involved, the ad-stitching server may send tracking on the player's behalf, but this tracking may be limited and not fully able to satisfy client-initiated measurement requirements. This server-to-server tracking process may also be problematic because all the tracking is coming from one IP address and therefore may be susceptible to IVT filtration techniques. Certain measurers may use custom integrations including transcoding or leverage aspects of the IAB's Video Ad Serving Template (VAST) and Video Player-Ad Interface Definition (VPAID), which allow header identification of IPs. Custom solutions shall be clearly disclosed as part of methodological documents and shall also comply with the client-initiated and rendered counting requirements within this document. To the extent that measurers are

not able to effectively measure in these environments, they shall be included and dimensioned within limitation disclosures.

Measurement that does not meet the client-initiated counting requirements discussed above or does not account for post-buffer and play requirements for a valid Digital Video Ad Impression as described in *IAB/MRC's Digital Video Impression Measurement Guidelines* should be segregated in reporting and disclaimed as non-compliant. Further, traffic shall be filtered for invalid activity.

Measurement that includes signals outside of the vendor's direct control (such as in server-to-server architecture or in publisher signaling such as VAST and other APIs) is permissible when it meets client-initiated and render requirements. However, this shall be subjected to robust initial and ongoing quality control as well data analytics exercised by the measurement vendor to ensure compliant measurement and to monitor for potential changes and errors.

Measurement vendors are required to conduct quality control procedures to onboard, vet and periodically review the use of indirect or third-party inputs into measurement. Such quality control procedures shall include (but not be limited to) executing scripts in third party environments to verify appropriate and accurate implementation both during onboarding and periodically on an ongoing basis. Use of code libraries and a process for validating the analysis of data collected by publishers or vendors using standard agreed upon signaling is strongly encouraged. Third party or publisher providers of measurement inputs may choose to have their functionality and inputs centrally validated/examined to provide assurance to their measurement users. This approach could significantly reduce (but not eliminate) the testing required by measurement users.

Measurement vendors using third party or indirect signals for measurement shall take steps to ensure their solution adequately covers any scenarios that may inhibit complete measurement. Any resultant limitations shall be adequately disclosed in conjunction with the disclosure requirements below.

5.2 Data Editing

Data editing is a highly critical aspect of a measurement service producing audience currency. Often the underlying measurement transactional data or other data sources for assignment or integration can have underlying problems/situations where individual data elements are suspect, incomplete, corrupt, missing or otherwise outside the boundaries of quality expectations. In these cases, data editing processes are generally used to eliminate, clean or possibly modify these problematic conditions within the data records. Data editing itself is considered a quality control.

Additionally, data editing rules include routine processing rules that are applied to raw collected data in the process of converting that data to useable records for ratings audience estimates. For example, closing gaps in collected data, bridging between data records or crediting broader levels of estimates from more discrete data.

The measurement organization shall monitor the extent of data editing applied within reported results. Significant types of data editing shall be disclosed with accompanying volumes in reports to customers or accompanying methodological reference materials.

5.2.1 Empirical Support

A measurement service shall have appropriate empirical support of data editing rules and decision processes and this support shall be periodically challenged and updated to reflect changing conditions. The measurement organizations shall have a dedicated data quality function, a key responsibility of which is to determine and monitor the application of data editing within general measurement, data assignment or data integrations processes. Empirical evidence gathered by the measurement service to support edit rules as required above shall at minimum establish that the edit rules do not lead to systematic over- or under-statements of audience.

Editing rules must be initially and periodically validated based on some first-party observations either by the measurement organization or partner third-party. Measurement organizations shall perform, document and periodically update empirical analyses to support their data adjustment methodologies and determine whether modifications to data adjustment procedures should be made. Measurement organizations shall give specific consideration regarding the appropriateness of the current variables and whether minimum/maximum cap values shall be established. It is expected that such empirical analyses are performed at least annually or within reasonable proximity of an annual cadence based on production cycles. Such empirical analyses may be supplemented with auditable support that it is expected that the data editing or collection environment is not expected to have changed since the last analysis.

5.2.2 Documentation and Consistent Application

A measurement organization shall have edits documented including an assessment of their impact so that an independent party can determine the purpose and specific operational parameters of the edit being applied. Data edits shall be consistently applied between measurement periods and significant changes to editing processes shall be disclosed with estimated impacts on reported results.

5.3 Quality Control Over Other Data Sources

Measurement organizations shall work with demographic vendors to understand the vendor's processes to append demographic data to records, including procedures in situations where the vendor is unable to append specific demographic information to a person, household or record when no direct source information is available.

5.4 Data Aggregation Controls

The *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines*, the *MRC Digital Audience-Based Measurement Standards* and the *MRC Guidelines Concerning Data Integration* contain guidance related to data aggregation controls and cross-media

measurement providers are expected to comply with guidance contained within these documents where applicable.

5.4.1 Quality control integrity checks throughout multiple data transfer points

Given the multiple data transfer points that may occur during data collection, as well as those post data collection, a risk of lost or incomplete data exists. Processes shall be established to verify the data remains complete and unaltered among the various transfer points. Data aggregators and their vendors shall maintain adequate internal controls to verify data from originating households/devices is not lost or altered unintentionally post initial collection at the set-top box or device. Automated validation checks at each data transfer point to reconcile what was sent versus what was received is preferred, along with processes to investigate any discrepancies to better control that no data is lost or unintentionally altered during the data collection transfer or processing.

5.4.2 Tests of Significance for Missing Data

Measurement organizations shall implement processes to identify and quantify the effects of missing vendor data, either due to data being lost in transit, lost in capture, or not captured due to data outages or natural disasters. This information shall be used to determine whether the missing data would have a biasing effect on the reported data, and whether such situations of missing data should be communicated to users of the data.

The initial step in this determination is to ascertain whether the outage or disaster prevented media exposure, meaning data is not missing from the measurement collection system. Such situations shall be disclosed to users of data along with estimated magnitude of impact as they may affect data trends differentially, but do not require additional adjustment by the measurement organization beyond existing projection or weighting. However, if media exposure was able to occur during the outage or disaster, the measurement organization shall determine whether the impact of any missing data is material and if so, take additional steps to account for it in reported estimates. These actions shall be based on established and supported objective criteria and be disclosed to users.

6 Computation of Audience Estimates

6.1 Weighting, data adjustment and modeling procedures

Measurement organizations shall give consideration to the level of granularity applied for weighting and data adjustment processes, dependent on how those adjustments impact reported metrics. Data adjustment and weighting processes shall be appropriately disclosed to users of the data.

Measurement organizations shall enumerate known types of missing data and any limitations shall be carefully studied. Efforts must be taken for any biases missing data or coverage gaps may introduce. Measurement organizations shall quantify the effects of known limitations and disclose the potential impact to users

Weighting, data adjustment and modeling procedures must be initially and periodically empirically supported and disclosed to users of data with quantification of impact. It is expected that such empirical analyses are performed at least annually or within reasonable proximity of an annual cadence based on production cycles. Such empirical analyses may be supplemented with auditable support that it is expected that the data editing or collection environment is not expected to have changed since the last analysis.

6.1.1 QC over vendor processes utilized to identify minutes with commercial content

Measurement organizations shall disclose to users the method by which the reference data to be utilized as part of commercial monitoring processes is collected, how those data sources are determined and an explanation of any limitations. Measurement organizations shall consider how they collect their reference data for use in commercial monitoring/ad verification and any limitations that could result from their selected method. Measurement organizations shall also have alerting mechanisms and resultant disclosures in place related to gaps in reference data.

Additionally, measurement organizations shall consider the need for redundancy as part of their process for collecting reference data, including the location of any redundant setups. Measurement organizations shall disclose to users any potential coverage gaps or data collection limitations so clients are aware of potential impacts to the inventory that is being monitored, as well as include discussions related to any geographical gaps or limitations. Measurement organizations are encouraged to have controls in place to identify and delineate traditional advertisements from other non-program content, if applicable and utilized in segregated for reporting (i.e., network self-promotions or public service announcements).

6.2 Live and TSV reported metrics

Measurement organizations shall collect and track the date and time content was originally broadcast or made available as well as the time and date of exposure to it. These data points shall be compared and used to apply objective and consistent crediting rules to determine live viewing and Time Shifted Viewing (TSV), particularly with regard to linear media exposure and digital distribution of repurposed linear media. In addition to data validation procedures discussed earlier in this document related to clock drift and timestamp synchronization, measurement organizations shall establish objective, supported, consistent and auditable editing, crediting and reporting rules for classification of live and TSV exposure. These rules shall be disclosed to users of the data and any changes to them affecting reported results shall also be disclosed with quantification of impact where material. The above applies to measurement of content individually and as a proxy for ad delivery where allowed as discussed above and is only applicable to ad measurement to determine appropriate inclusion within campaign and reporting parameters.

7 Enhancing Audience Based Tracking Accuracy

7.1 General

Guidance and requirements of other MRC, IAB/MRC, and, where applicable, IAB/MMA/MRC measurement guidelines are applicable where relevant. These include (but are not limited to) the following impression counting guidance areas:

- Segregation of Pre-fetch / Pre-render Activity
- Auto-Refresh Ads
- Auto-play Ads and Video, Other Non-user Intended Content
- Forced Duration
- Applications On-line vs. Off-line Activity and Other Mobile Application Guidance
- Inactivity Considerations and Limits

7.2 Filtration for Invalid Activity

Filtration of measurement data to remove invalid activity (IVT) is highly critical for accurate, consistent counting. All metrics subject to audit by MRC will be expected to comply with the *MRC's Invalid Traffic and Filtration Guidelines Addendum*. This includes digital metrics, which should be filtered for known General Invalid Traffic as required by those guidelines.

Furthermore, as discussed in the *MRC Digital Audience-Based Standards*, while application of Sophisticated Invalid Traffic detection processes is strongly encouraged for monetized traffic, digital audience and persons level measurement requires a higher degree of precision and accuracy. As such, digital audience measurement (including cross-media audience measurement) and reporting requires filtration for both General and Sophisticated Invalid Traffic.

Certain aspects of OTT traffic may require further consideration with regard to invalid traffic filtration. Specifically, the potential disproportionate presence of proxy or data center traffic in OTT traffic (due to the delivery models present) may not only lead to false positives (valid traffic filtered), but also inhibit the ability to collect certain parameters or originating information necessary to effectively evaluate traffic for validity. OTT measurement vendors shall consider these aspects of OTT traffic when applying invalid traffic detection and filtration techniques to it and consider false positives as required (proxy and data center traffic must be known to be invalid in order to be filtered). These Standards highly encourage publishers to pass parameters to measurement organizations necessary to enable more accurate and discrete OTT IVT detection and filtration.

It is expected that consideration is given to the presence and filtration of invalid traffic across media environments and delivery devices. A periodic risk assessment (at least annually for both General and Sophisticated Invalid Traffic as applicable) for the measurement organization shall be performed in conjunction with assessing the sufficiency of the internal control objectives and resulting internal controls. This shall be conducted differentially for each media environment and platform (desktop/mobile web, in-app, OTT and linear) and include

assessments of the continued relevance and effectiveness of IVT procedures, in addition to ongoing analyses of accuracy and the identification/internal reporting of false positives and negatives.

While large scale automated IVT within actively tracked linear video consumption may not be materially present, self-directed human IVT related to media-affiliated or compromised respondents is a risk that shall be monitored and mitigated with ongoing controls. Further, linear delivery devices including STBs, connected TVs and OTT devices may be subject to manipulation via automated control either for the purpose of generating invalid linear activity or other invalid digital activity. Finally, raw tuning records collected and provided by third party content providers shall be subject to quality control inclusive of analysis and filtration for invalid activity as in these situations there may be a direct incentive to falsify and inflate traffic.

While it is expected that all cross-media measurement represents activity total net of SIVT, where IVT filtration is not directly used in certain environments, there shall be an active requirement to demonstrate immaterial impact of IVT via auditable evidence, disclose this and consider revising and reissuing impacted data should such incidences be discovered after corresponding data is reported. It should be noted that IVT as discussed above and as required throughout this document, does not include data editing or cleaning to remove incomplete or corrupt data nor adjustment of records (such as cut-off and inactivity rules) that may not represent illegitimate activity.

7.3 Privacy

Vendors and publishers must disclose to the end user through the provision of concise, clear privacy policy notices describing how their products and/or services use and share data and what the consumer's choices are. In connection with end users who voluntarily disclose data, the use of clear opt-in practices is required and vendors are encouraged to establish first-party relationships for collection of audience data where feasible.

Entities employing voluntary audience collection must include the functionality to provide prompts when requesting current audience data, with a clear opt-in as well as the option for the consumer to accept or deny permission. Entities using application services for voluntary audience collection must get the user's permission at application initialization or during use and request this access again each time a user changes the permission in the services setting within the device settings.

A publisher or vendor must clearly state in their privacy policy why they are collecting this information and how it may be shared. If respondents have been led to believe, directly or indirectly, that their anonymity will be protected, their names, addresses and other such identifying information shall not be made known to anyone outside the measurement service organization.

Measurement organizations are encouraged to consider and comply with additional industry and regulatory guidelines and requirements in this area including the EU General Data Protection Regulation (GDPR) where applicable and the following:

The *IAB's Mobile Location Data Guide for Publishers*:

(http://www.iab.com/wp-content/uploads/2016/04/IAB_Mobile-Location-Data-Guide-for-Publishers_Feb2016-Revised.pdf)

The *Digital Advertising Alliance's Self-Regulatory Principles*:

(<http://www.aboutads.info/principles>)

The *Network Advertising Initiative's Code of Conduct*:

(<http://www.networkadvertising.org/code-enforcement/code>)

Additionally, measurement organizations seeking MRC accreditation are required to adhere to relevant *MRC Minimum Standards* in this area. Localized privacy regulations must also be considered. Privacy regulations as they emerge must be monitored and staged for the measurement organization as soon as known.

Finally, if a vendor or application collects data that is intended to be used for behavioral analysis to determine user heuristics, this must be made known to users as part of permissions, terms and conditions and privacy policies. Tracking users throughout a day and combining sessions to determine certain heuristics has privacy implications that must be considered in disclosures and user-facing policies or terms and conditions.

8 Reporting Parameters

8.1 General Parameters

General reporting parameters (dayparts, week parts, time zones, etc.) provide for consistency and comparability. These shall be based on the logical application of information about the usage patterns of the medium.

In order to provide for more standardization in cross-media audience measurement reporting, the following general reporting parameters are recommended. Note that these are only several of the possible reporting parameters that may be used. If parameters in addition to these are reported, similar rules shall be defined and applied. Many of these have been specified on a consistent basis with prior MRC/IAB measurement guidelines.

8.2 Time

Day — 12:00 midnight to 12:00 midnight

Daypart — Digital and cross-media usage patterns need further analysis to determine the usefulness of establishing effective and logical standardized reporting dayparts (such as working

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hours and non-working hours normalized across time zones). We encourage such analysis to determine the need for standardization of this measurement parameter based on marketplace needs and behaviors.

To the extent that audience measurement is specific to a media vertical (e.g., TV), measurers are encouraged to conform to existing and standardized dayparts (e.g., broadcast day), especially with regard to cross-media comparisons or GRPs. However, it is likely that media-agnostic measurement will need to be further studied to determine traffic and usage patterns. Digital specific dayparts shall be supported by empirical traffic analysis. Custom dayparts shall be fully disclosed.

Time Zone – Full disclosure of the time zone used to produce the measurement report is required. It is preferable, although not a current compliance requirement, for certified measurement organizations to have the ability to produce measurement reports in a consistent time zone so buyers can assess activity across measurement organizations. For US-based reports it is recommended that reports be available on the basis of the Eastern Time; for non US-based reports this is recommended to be GMT.

Week — Monday through Sunday

Week-parts — M-F, M-Sun, Sat, Sun, Sat-Sun

Month – Three reporting methods: (1) TV Broadcast month definition. In this definition, the Month begins on the Monday of the week containing the first full weekend of the month, (2) 4-week periods – (13 per year) consistent with media planning for other media, or (3) a calendar month. For financial reporting purposes, a month is defined as a calendar month.

8.3 Location

If information about the geographic location of the users is collected and reported, any limitations to the methods used shall be disclosed. Location measurement and disclosure shall be consistent with *MRC Location-based Measurement Standards* where applicable when used for targeting or assignment of specific location such as home and out of home or market. User/device location may represent point in time location or may be used to determine home location and such distinction shall be disclosed to users as part of methodological and definitional disclosures.

The location of media usage shall be considered and consistent in cross-media combinations relative to the Universe being measured for both geographic reporting as well as the impact on reported results (for example home-only measurement of media that can be consumed both in home and out of home). Materially complete coverage of possible media usage locations is required for total audience and cross-media measurement. Reported data shall be filtered to exclude activity outside of the geographic area intended for measurement.

8.4 Minimum Reportability Standards

Measurement vendors must establish empirically supported minimum requirements for reporting (for specific measured properties or metrics) and are required to disclose the minimum requirements.

8.5 Data Retention Requirements

Detailed collected data (pre and post-processing) supporting cross-media audience-based measurement shall be retained for a sufficient period – at least eleven months after the release of data. Obfuscated or truncated data may be maintained to satisfy this requirement, shall there be Personal Identifying Information (PII) or privacy concerns, but shall be available in a transparent manner to accreditation/certification auditors and at a detailed level to allow reprocessing of reported estimated where necessary.

Different metric/transaction types and varying risks associated with transaction types shall be considered. PII legal restrictions may dictate eliminating one or more of collected fields from retained records or altering the content of fields for identity protection purposes. Further, privacy or contractual restrictions on raw data may stipulate shorter retention periods. Such restrictions may still allow for alternative levels of retention that are still sufficient to support reprocessing of data. In these cases deviations shall be supported by the measurement organization's privacy policy and shall be available for review by auditors.

9 STB and RPD Reporting Guidance

The *MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines*, contain guidance related to STB and RPD reporting and cross-media measurement providers are expected to comply with guidance contained within these documents where applicable.

9.1 Segregation of residential vs. commercial STBs

Measurement organizations shall give consideration to removing or segregating commercial STB data from residential STB data. If such STB data is obtained from vendors, measurement organizations shall work with those vendors in order to obtain the necessary information to segregate residential from commercial STB data.

9.2 Footprint and response rate disclosures

Measurement organizations shall implement processes to identify, calculate and disclose vendor footprint and responder rate (or capture rate) statistics. The analysis of this data may need to be performed on a daily basis dependent upon the measurement and related modeling methodologies. Additionally, these statistics may need to be reported at the local level, dependent upon whether the measurement service is reporting metrics at the local level.

10 Disclosure Guidance

Cross-media audience-based measurement organizations shall disclose their audience measurement activity recording process to buyers, sellers and other users of the measurement

data. An organization's methodology for accumulating cross-media audience measurements shall be described to users of the data, including methods for calculating unit audiences where applicable. Specifically, the nature of counts and/or measurements, methods of sampling used (if applicable), data collection methods employed, data editing procedures or other types of data adjustment or projection, calculation explanations, reporting standards (if applicable), reliability of results (if applicable) and limitations of the data shall be included in the disclosure. See *MRC's Digital Audience-Based Measurement Standards* for further disclosure guidance. Cross-media measurement organizations are required to comply with disclosure guidance noted therein.

11 Auditing Guidelines

11.1 General

Third party independent auditing is encouraged for all digital cross-media audience measurements used in the buying and selling process. This auditing is recommended to include counting methods, measurement methods and assignment for cross-media audience and processing/controls as follows:

1. **Counting Methods:** Independent verification of activity for a defined period. Counting method procedures generally include a basic process review and risk analysis to understand the measurement methods, analytical review, transaction authentication, validation procedures and measurement recalculations.
2. **Panel/Census/Assignment Methods:** Independent verification of activity to assign audience characteristics. These procedures generally include process reviews, methods to ensure accurate representation, qualifiers applied and testing of application of these qualifiers for inclusion in audiences, transaction authentication, validation of weighting and projection procedures and measurement recalculations.
3. **Processes/Controls:** Examination of the internal controls surrounding all phases of the measurement process. Process auditing includes examination of the adequacy of applied counting and qualification techniques.

Although audit reports can be issued as infrequently as once per year, some audit testing shall extend to more than one period during the year to assure internal controls are maintained. Audit reports shall clearly state the periods covered by the underlying audit testing and the period covered by the resulting certification.

11.2 U.S. Certification Recommendation

All cross-media audience measurement products used in the buying and selling process are recommended to be certified as compliant with these Standards, at minimum annually. This recommendation is strongly supported by the 4As, ANA and other members of the buying community, for consideration of measurements as "currency."

In addition to MRC, there are a number of other certifiers and types and levels of certification available to organizations involved in media measurement.

A number of cross-media audience products exist in the US and some of these products have had certain aspects accredited by the MRC. Upon finalization of these Standards, in addition to timely evaluation of each of these products for compliance, a reconciliation process will likely need to take place that accounts for the differential data collection, editing and projection techniques employed by the respective vendors and the potential impacts on reported estimates. It remains to be determined whether this reconciliation occurs as part of recurring audit functionality or on a separate formal basis.

Special Auditing Guidance for Advertising Agencies or Other Buying Organizations:

If buying organizations modify or otherwise manipulate measurements from certified digital audience-based audience measurement organizations upon receipt, auditing of these activities should be considered.

11.3 International Certification Recommendation

The MRC encourages non-U.S. measurers of activity to adopt the practices spelled out in these Standards. While certification regimes may vary on a country-by-country basis, we encourage measurers to be audited for compliance annually by independent, third party auditing organizations.

12 Glossary of Terms

Ad-ID® – a standard for identifying advertising assets (broadcast, print and digital) across all media platforms that generates a unique identifying code for each advertising asset. The Ad-ID system was developed by 4A's and ANA.

Ad Campaign – A collection of messages from an advertiser or client that is designed to run during a specific interval and / or within a set of media outlets (Source: CIMM Lexicon 3.0).

Application (Mobile) – In the context of this document, a type of application software designed to run on a mobile device, such as a smartphone or tablet.

Application Programming Interface (API) – A set of routines, protocols and tools for building software applications. An API defines functionalities that are independent of their respective implementations, which allows definitions and implementations to vary without compromising the interface. In the context of this document, an API is one of the available techniques to gather and transmit information about mobile viewability measurement within an application at the publisher side (Source: MRC *Mobile Viewability Guidelines*).

Asset Identifier – In general, the digital measurement asset used to track unique advertising and content both within digital distribution and in cross-media environments. For digital

measurement of advertising this is may include a tracking asset such as a tag or other digital measurement method as well as encoding, watermarking or other industry and proprietary identifiers (for both advertising and content).

Audience – Audience activity generally consists of counts of Internet users accessing content and/or advertising through one or more Internet applications such as a browser or a browser-equivalent [or mobile application], filtered to remove suspected Invalid Traffic (Source: IAB).

Audience Composition – The audience breakdown of aggregated, segmented characteristics, often reported as a percentage, based on such elements as age, gender, income, education, household characteristics etc. (Source: IAB). In addition to demographic characteristics, Audience Composition may also include behavioral variables such as site visitation, purchase activity, location etc.

Average Audience Rating – The amount of viewing (expressed as a percent) on average, to a program, network, channel, ad, version or time period out of the universe or full population. (Source: CIMM Lexicon 3.0). Based on the average second, 5 second, minute or other time frame (most precise possible granularity is preferred) within the total duration of the ad or program content and may be aggregated by channel or brand.

In TV, average minute audience is often used and represented the average number of individuals viewing a channel. Average minute audience is calculated by averaging the total minutes viewed divided by the total viewing universe over a specified time or program and may be considered for use in longer format video ads.

Browser (or Web Browser) – A software application for retrieving, presenting, and traversing information resources on the World Wide Web.

Caching – Memory used to temporarily store the most frequently requested content, files or pages in order to speed its delivery to the user. Caches can be local (i.e. on a browser) or on a network (Source: IAB). As discussed in this document, IAB measurement guidelines require certain cache busting techniques designed to minimize the impact on measurement accuracy of cached measurement assets.

Census Data – Measurement designed to represent a complete count of a population of a universe as opposed to a sample or subset.

Compression – The process by which files of data or video content are reduced in size to facilitate fast transmission and requiring less storage space (Source: CIMM Lexicon 3.0).

Client User – A mobile device that interacts with an application, essentially executing or otherwise reviewing the application. The number of Users (people) or the demographic characteristics of the Users interacting with the application through the Client User is not necessarily known.

Cookie – A small piece of information (i.e., program code) that is stored on a browser for the purpose of identifying that browser during audience activity and between visits or sessions. Cookies are typically set to expire. Some cookies are intended to remain on the browser temporarily (for example, during a session) and some are persistent in that they are intended to be retained for longer periods. (Source: IAB)

Coverage – The extent or area covered by sampling or a data source relative to the population measured. Throughout this document coverage is used when discussing projecting audience estimates based on a subset or sample of the measured population as well as the degree to which a particular data set or source represents a measured population.

Data Fusion – Combining data from two or more different sources where the data merges and becomes blended into a new data source (Source: CIMM Lexicon 3.0).

Data Integration – Combining data from two or more different sources while having the data maintain its individual database integrity (Source: CIMM Lexicon 3.0).

Data Normalization (also Calibration) – Where there are two or more disparate data points within a data set, combining them in such a way that maintains data integrity and accuracy while improving usability (Source: CIMM Lexicon 3.0).

Duplication/De-Duplication – The instances where a Unique (Cookie, Browser, Device, Household, Respondent, User or Visitor) is exposed to the same content or advertisement more than once within the same dataset or measurement period. De-Duplication is the data editing technique used to remove Duplication from reported processed data or reported results.

Duration Weighted Viewable Impressions (DWVI) – Viewable Impressions that include duration weighting (total unduplicated viewable duration divided by the video ad creative length or a day or daypart for content). The maximum allowable credit of viewable duration for any one exposure or session is the creative length, representing completion.

Entertainment Identifier Registry (EIDR®) – A global unique identifier system for a broad array of audio visual objects, including motion pictures, television, and radio programs. The identification system resolves an identifier to a metadata record that is associated with top-level titles, edits, DVDs, encodings, clips, and mash-ups. EIDR also provides identifiers for Video Service providers, such as broadcast and cable networks.

Encoding/Watermarking – The process of embedding a code or unique identifier, often a sequence of characters (letters, numbers, symbols, etc.) into a specific format, often in the context of this document to track and identify content and ad transmission and consumption.

Forced Duration – The portion or duration of video ads during which a user cannot skip the ad to begin content. Forced duration may be configured to span the entire duration of an ad or

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only a portion of it and contrasts with the portion or duration of video ads during which the user has the ability to skip the ad (generally referred to as “Organic Duration”).

Frequency – The number of times an ad is delivered to the same Browser (or user) in a single Session or time period (Source: IAB). The average number of times the unduplicated homes [or persons] reached are exposed to a schedule of content whether an ad, a program, a video or a schedule of spots (Source: CIMM Lexicon 3.0).

Duration Weighted Frequency includes duration weighting (total unduplicated viewable time divided by the video ad creative length or a day or daypart for content). The maximum allowable credit of viewable duration for any one exposure or session is the creative length, representing completion.

Gross Rating Point (GRP) – The sum of all the rating points for a specified advertisement or advertising campaign reported as a gross number. For a given population, Reach multiplied by average Frequency equals Gross Rating Points.

Duration Weighted GRP (DWGRP) includes duration weighting (total unduplicated viewable time divided by the video ad creative length a day or daypart for content). The maximum allowable credit of viewable duration for any one exposure or session is the creative length, representing completion.

Impressions (digital ad or linear commercial) – An Ad Impression is generally a measurement of delivery of an ad that meets established minimum thresholds for quality and the terms and conditions established between a seller and a buyer (Source: IAB). Valid Ad Impressions must meet the minimum requirements of the IAB Measurement Guidelines for the applicable creative type (Display, Rich Media or Video) and user environment (desktop browser, mobile web and application environments).

Inactivity – In digital media may refer to specific inactivity rules, by which a user visit is terminated and thus excluded from additional contributions to Time Spent after a pre-determined level of consecutive minutes of inactivity (Source: *IAB Audience Reach Measurement Guidelines*).

In-Tab – Generally, measured data that is considered and included within reported results (intabulation) and not removed for editing purposes or because of noncompliance issues.

Linear TV – Real-time television services that broadcast scheduled programs or content, conventionally over the air or through satellite/cable, not streamed to a specific user. This is inclusive of recording linear content for playback or time-shifting.

Meter – Any automatic recording device or appliance, which may be hardware or software based and which is used to electronically collect measurement data including tuning, Internet activity and other media exposure.

Mobile Application – Mobile In-Application (In-App) refers to content and ads within the native User Interface of an application and not content within either a mobile browser or an embedded browser within an application environment (an instance that is embedded within a native application; typically, this occurs when a user clicks on a URL in a mobile application and the application executes the embedded browser).

Non-Probability Sample – A type of sample that is generally not probabilistic and may or may not be proportionate to a measured universe. An example of a non-probability sample is a convenience sample which includes respondents or data points that may be the easiest to reach or measure and as a result may include certain response and non-response biases.

Over-The-Top (OTT) – Delivery of digital video to televisions via internet-connected devices (or functionality within the television itself). This includes both IP set top boxes that receive signals from digital video ad servers (and widgets on them) as well as USB and HDMI multimedia devices, connected TVs and gaming consoles that do not require set top boxes or converters (Source: *IAB/MRC Digital Video Impression Measurement Guidelines V1.1*). OTT does not include linear video or VOD content delivered through digital means via cable head-ends (which would be considered linear TV for purposes of this document), nor streaming of linear content to mobile devices (which would be considered digital video), although this document covers and allows combinations of all of these formats (these definitions are just for report segregation).

Panel Data – A selected cross section of opt-in consumers or viewers [consumers or viewers who agreed to have their behavior and usage measured] whose behavior and usage is measured over a period of time as a group or set of sub groups with the intent to form opinions and trends about their behaviors (Source: CIMM Lexicon 3.0).

Personally Identifiable Information (PII) – Data that can be used to identify a specific individual. This includes names, addresses, email addresses, phone numbers, among others (Source: CIMM Lexicon 3.0). Any information about an individual maintained by an agency, including (1) any information that can be used to distinguish or trace an individual's identity, such as name, social security number, date and place of birth, mother's maiden name, or biometric records and (2) any other information that is linked or linkable to an individual such as medical, educational, financial and employment information (Source: NIST, Guide to Protecting the Confidentiality of PII). Refers to information such as an individual's name, mailing address, phone number or e-mail address (Source: IAB).

Probability Sample – A random selection method to create a sample that is designed to best replicate the greater census or Universe being measured. Each selection in the sample must have the same probability of being chosen within relative sampling strata for sample selection.

Rating – A percentage calculated as: (A) the number of respondents (or projected respondents in a sample or otherwise measured group), filtered for invalid activity that consumed (i.e.,

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represented by the opportunity to see; viewable) an advertisement over a period of time, divided into (B) the total population included in the measured frame (i.e., the Universe Estimate).

Reach – The amount of unduplicated homes or audience, expressed either as a percentage or in thousands who have viewed or tuned [consumed] at least once during a time period or program or any piece of content (Source: CIMM Lexicon 3.0). Unique users that visited the site measured over the course of the reporting period or the total number of unique users who will be served a given ad (Source: *IAB Audience Reach Measurement Guidelines*).

Registration Data – Data collected via a process for site visitors to enter information about themselves. Sites use registration data to enable or enhance targeting of content and ads. Registration can be required or voluntary (Source: IAB).

Return Path Data/Return Path – A communication channel that can be used by a Set-top Box or Smart TV to communicate with the cable headend or a service provider. Some homes and certain types of devices (e.g. non digital Set-top Box) do not have return path capability. Return path communication in Satellite homes is facilitated through landline phone lines or an independent broadband connection. Return Path Data can apply to other devices and digital data paths as well.

Server-Side Ad Serving (can include Stream Stitching, Video Pre-Loading or Ad Stitching) – In the context of mobile video, the use of an intermediary server to insert ads dynamically into video streams on the server side or directly embedding ads into video content prior to content delivery where a streaming video player is not capable of executing dynamic ad responses or tracking impressions and interactions (Source: *MRC Mobile Viewability Guidelines*).

Session – A single exposure event that spans an unspecified period of time of constant or ongoing activity by a User through the Client User. Sessions are terminated by User actions indicating the closing of an application, browser or device or by inactivity levels that meet or exceed defined thresholds. Sessions are generally applicable to the calculation of reach metrics (Source: *IAB Audience Reach Measurement Guidelines*).

Set-top-Box (STB) – A hardware device that allows a digital signal to be received, decoded and displayed on a television. The signal can be a television signal or Internet data and is received via cable or telephone connection.

Software Development Kit (SDK) – A separate sub-application within the application environment, which is directed at performance of certain common functions such as measurement or counting of advertising activity and/or the delivery or storage of advertising content. (Source: *MRC Mobile Viewability Guidelines*).

Syndicated Measurement – Measurement shared across all media outlets via standard reports, not solely on an individual or proprietary basis.

Targeting – A technique used by online publishers and advertisers to increase the effectiveness of their campaigns based on behavior or demographic characteristics [by focusing advertising impressions against a pre-determined sub-set of the universe or the “target”; targeting may be based on demographics, behavior, or other measurable characteristics]. Behavioral targeting uses information collected on an individual’s web browsing behavior such as the pages they have visited or the searches they have made to select which advertisements to be displayed to that individual (Source: IAB).

Time Spent/Dwell Time/Duration – The amount of elapsed time from the initiation of a visit to the last audience activity associated with that visit. Time spent can be reported on the basis of cookied browsers, registration or panel participation, but in concept should represent the activity of a single cookied browser or user for a single access session to the web site or property. (Source: *IAB Audience Reach Measurement Guidelines*)

Unique (Various; Source *IAB Audience Reach Measurement Guidelines*):

Machine-Based Measures:

Unique Cookies – A count of unique identifiers (Cookies) that represents unduplicated instances of Internet activity to Internet content or advertising during a measurement period.

Unique Browsers – An identified and unduplicated Cookied Browser that accesses Internet content or advertising during a measurement period.

Unique Devices – An unduplicated computing device that is used to access Internet content or advertising during a measurement period.

People-Based Measures:

Unique Users or Visitors (both terms are acceptable and equivalent) – An identified and unduplicated individual Internet user who accesses Internet content or advertising during a measurement period.

While the IAB Audience Reach Measurement Guidelines establish certain levels of unique measurement, audience assignment shall only be done at the unique device or, more preferably, unique user level. As a result, a digital audience measurement vendor must have a robust methodology to identify and deduplicate unique devices and/or users for such assignment.

Universe – The total population included in the measured frame.

Video Ad Serving Template (VAST) – An XML response framework that enables a consistent delivery format for ads or advertising across streaming video platforms that is administered by the IAB.

Video On Demand (VOD) – A programming system which allows users to select and watch video content such as movies and TV shows whenever they choose, rather than at a scheduled broadcast time. Television VOD systems can stream content through either a set-top box, a computer or other device.

Viewable Impression – An Ad Impression that meets certain pixel and time thresholds in order to qualify as a Viewable Impression. These thresholds are designed to add greater assurance that there was an “opportunity to see” the ad by the user beyond assurance that the ad was properly served and rendered by the device. See the *MRC Viewable Impression Measurement* and *MRC Mobile Viewable Impression Measurement Guidelines* for guidance on Viewable Impressions. **For purposes of this Cross-Media Audience Standard, viewable video impressions where 100% of the ad’s pixels are in view for at least 2 continuous seconds in both digital and traditional linear video are required for input into cross-media comparisons and combinations.**

Weighting – The statistical application that creates stronger or lesser impact on parts of a sample or a subset of a data set to help the entire sample results better conform to the universe it is projecting to measure (Source: CIMM Lexicon 3.0).

13 References

MRC Digital Audience-Based Measurement Standards:

<http://mediaratingcouncil.org/MRC%20Digital%20Audience-Based%20Measurement%20Standards%20Final%201.0.pdf>

MRC Multi-Channel Digital Video Data Capture, Accumulation and Processing Guidelines

<http://mediaratingcouncil.org/Guidelines%20for%20the%20Capture,%20Accumulation%20and%20Processing%20of%20RPD%20Data.pdf>

MRC Guidelines Concerning Data Integration:

<http://www.mediaringcouncil.org/MRC%20Guidelines%20Concerning%20Data%20Integration.pdf>

14 Supporting Associations and Participating Organizations

About the Media Rating Council (MRC)

The Media Rating Council is a non-profit industry association established in 1963 comprised of leading television, radio, print and digital media companies, as well as advertisers, advertising agencies and trade associations, whose goal is to ensure measurement services that are valid, reliable and effective. Measurement services desiring MRC accreditation are required to disclose to their customers all methodological aspects of their service; comply with the *MRC Minimum Standards for Media Rating Research* as well as other applicable industry measurement guidelines; and submit to MRC-designed audits to authenticate and illuminate their procedures. In addition, the MRC membership actively pursues research issues they consider priorities in an effort to improve the quality of research in the marketplace. Currently approximately 110 research products are audited by the MRC. Additional information about MRC can be found at www.mediaratingcouncil.org

About the American Association of Advertising Agencies (4A's)

Founded in 1917, the 4A's was established to promote, advance and defend the interests of our member agencies, their employees and the industry at large. The organization serves 600+ member agencies across 1,200 offices, which control more than 85% of total U.S. advertising spend. As the leading trade organization for marketing communication agencies, the 4A's purpose is to help empower its members to deliver insightful creativity that drives commerce, and influences culture all while moving the industry forward. The organization provides community, leadership, advocacy, guidance and best-in-class training that help enable agencies to innovate, evolve and grow. 4A's Benefits division insures more than 160,000 employees and its D.C. office advocates for policies that best support a thriving advertising industry. The 4A's Foundation fuels a robust diversity pipeline of talent for its members and the marketing and media industry, fostering the next generation of leaders. The organization is dedicated to, and vested in, our members' success just as they are dedicated to helping brands create, distribute, and measure effective and insightful advertising and marketing. Visit the 4A's at <http://www.aaaa.org>

About the Association of National Advertisers (ANA)

The ANA (Association of National Advertisers) makes a difference for individuals, brands, and the industry by driving growth, advancing the interests of marketers, and promoting and protecting the well-being of the marketing community. Founded in 1910, the ANA provides leadership that advances marketing excellence and shapes the future of the industry. The ANA's membership includes more than 1,850 companies and organizations with 20,000 brands that engage almost 50,000 industry professionals and collectively spend or support more than \$400 billion in marketing and advertising annually. The membership is comprised of more than 1,100 client-side marketers and more than 750 marketing solutions provider members, which include leading marketing data science and technology suppliers, ad agencies, law firms, consultants, and vendors. Further enriching the ecosystem is the work of the nonprofit ANA Educational

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Foundation (AEF), which has the mission of enhancing the understanding of advertising and marketing within the academic and marketing communities.

About the Interactive Advertising Bureau (IAB)

The Interactive Advertising Bureau (IAB) empowers the media and marketing industries to thrive in the digital economy. Its membership is comprised of more than 650 leading media companies, brands, and the technology firms responsible for selling, delivering, and optimizing digital ad marketing campaigns. The trade group fields critical research on interactive advertising, while also educating brands, agencies, and the wider business community on the importance of digital marketing. In affiliation with the IAB Tech Lab, IAB develops technical standards and solutions. IAB is committed to professional development and elevating the knowledge, skills, expertise, and diversity of the workforce across the industry. Through the work of its public policy office in Washington, D.C., the trade association advocates for its members and promotes the value of the interactive advertising industry to legislators and policymakers. Founded in 1996, IAB is headquartered in New York City.

About the Video Advertising Bureau (VAB)

VAB helps brand leaders navigate today's technology-rich, data-fueled world through its industry-defining insights and research, all developed through a marketer's lens. Built to address the challenges of today and inspire the conversations of tomorrow, VAB uncovers trends and tackles topics that drive business growth and value. We unravel the complexity of today's evolving media landscape, empowering marketers to make fully informed decisions.

Participating Working Group Organizations:

4As	Flipboard	PricewaterhouseCoopers
A+E Networks	FOX News	Publicis Media
Alliance for Audited Media (AAM)	FOX TV Stations	Publicis Media: Starcom
Abbott	FreeReach	Publicis Media: Zenith
ABC Disney	FreeWheel	PwC
ABC Group	Geopath	Quantcast
Ad-ID	GfK MRI	Radio Research Consortium
Adledge	GM	Raycom Media
Altice	Google	RealVu
AMC Networks	Graham Media Group	Reuters
ANA	GroupM	Rogers
Annalect	HBO	Roku
Are You A Human	Hearst Digital Media	Samba TV
ARF	Hearst Television	Simmons Research
ASI Conferences	Horizon Media	Snapchat
Assn. of Canadian Advertisers (ACA)	HubResearch LLC	Sony TV Pictures
Bank of America	Hulu	Spectrum Reach
Bell	IAB	SpotXchange

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Blinc Digital Group	IAB Canada	Standard Media Index
BPA Worldwide	Index Exchange	Symphony Advanced Media
Broadsign	Initiative	TAG
Campbell-Ewald	Innovid	Teads
CBC	Integral Ad Science	tenthavenue
CBC / SRC	Ipsos	ThinkTV Canada
CBS	ISBA	Triton Digital
CBS Interactive	ITN Networks	Tunity
CIMM	LAMAC	Turner Broadcasting
Clypd	Management Science Assoc.	Tvision Insights
CMDC	Mansueto Ventures	TW Cable
CNN	Mbooth	Twitter
Community Newspaper Holdings	MEC	Undertone
comScore	Meredith Corp.	Unilever
Conde Nast	MESH Experience	Univision
Conversant Media	MMA	Univision Radio
Conviva/Delmondo	Moat/Oracle	UP
Corus	MPA	UP & Aspire
Cox Media Group	MSNBC	Verance
Cumulus Media	NBC Owned Stations	Viacom Media Networks
CW Network	NBC Universal	Video Advertising Bureau (VAB)
DataXu	NCC Media	Visible Measures
Deloitte & Touche	News Inc.	Vivadata
Dentsu Aegis Network	Nielsen	Watching That
Digital Content Next	Nielsen Catalina Solutions	WBEB
Discovery	NinthDecimal	WeberShandwick
DoubleCheck Advertising	Numeris	Weigel Broadcasting
DoubleVerify	P&G	WFA
EGTA	Pandora	WhiteOps
ESPN	PepsiCo	WPLG (Berkshire Hathaway)
EY	PGA Tour Digital	xAd
Facebook	Pixalate	Yahoo!

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Appendix A: Duration Weighting Detail

Background

The concept of duration weighting for video ads was introduced for the first time in the *Digital Audience-Based Measurement Standards*. Those Standards stipulated that when digital video audience metrics are intended for use in cross-media comparisons and aggregations, these shall be calculated on a duration weighted basis, which was defined in that document to mean that the viewable impression on which the estimate is based shall be discounted by the duration of the exposure in relation to the total length of the video advertisement.

While MRC felt it was important to introduce the concept of duration weighting in advance of a *Cross-Media Audience Measurement Standards* document based on strong feedback from working group participants requesting additional duration metrics, previous duration weighting guidance for cross-media as noted in the *Digital Audience-Based Measurement Standards*, issued December 2017 is superseded by the guidance contained in this document. The *Cross-Media Audience Measurement Standards* contemplate an equitable application of duration weighting across all media involved. In other words, duration weighted digital video GRP estimates, where reported, are expected to be compared/combined with duration weighted video GRP estimates for all other media types on a consistent and identical basis.

Duration weighing is NOT a measure of ad effectiveness it is not recommended to be utilized on a standalone basis in this manner. Duration weighting provides a measure of how much time across all delivered viewable impressions was spent. Duration weighting also accounts for differing ad length, makes separate GRPs for creatives of different length more comparable and normalizes exposure across platforms and media. However, the concept of duration weighting as spelled out in the *Digital Audience-Based Measurement Standards* implied a direct linear relationship associated with the time a digital video ad is in view and how well that ad delivers on its goals (whether a viewer is “effectively exposed”).

Additionally, the actual segment of an ad viewed may have differential value. For example, segments of an ad with strong, early and frequent branding presence may represent more effective exposure as historical industry research has shown. Further, viewable duration during concurrent usage of other media or repeat (or single) exposure may have differential effectiveness. Finally, exposure to differing media may likewise carry differential effectiveness.

MRC recognizes the challenges that are inherent in requiring duration weighting for media that have differing measurement systems that currently may be less capable of the highly granular time measures available today in digital. Balancing this knowledge of current state measurement practices across different media types with an understanding of their potential capabilities, along with our desire to achieve fairness in measurement of all media, is central to MRC’s considerations within this document. The overall objective is to foster consistency as much as possible, including consistency in the levels of time granularity applied.

Research

While the MRC believes some form of duration weighting is important for cross-media video measurement based on historical public industry research showing the potential impact of duration¹, as part of efforts to set these Cross-Media Standards, further research was requested to better understand this relationship and how to better operationalize it in duration weighted measurement calculations. These Standards reflect further industry research concerning duration weighting. The concept of exposure effectiveness and the translation of it into the contribution of differing levels of exposure to audience and effectively operationalizing it into standard audience metrics calculations were the main objectives of MRC's request for research in this area.

Seven different organizations provided either granular or generalized datasets related to our request for research. These included recall surveys, eye-tracking and biometric studies and research and granular data to varying degrees including analysis of over 3 billion impressions. Unless specified in advance by the source supplying the research, all data supplied to MRC for this project was maintained under strict confidentiality. However, we can state that generally, among the research containing discrete data that was received and reviewed by MRC related to this request, there was strong support that reaffirmed the importance of varying forms of duration in audience measurement including evidence of a direct, while not always linear, correlation between viewable duration and impact as well as recall of a creative.

However, some of the research received and reviewed did indicate that simple or relative duration weighting based on the length of a creative may lead to biases or skews toward shorter-form creatives. For example, these datasets indicated the incremental lift observed from ad exposure is roughly comparable or equal at fixed durations, regardless of ad length, indicating duration weighting relative to ad length may either undervalue longer formats or overvalue shorter formats. Moreover, certain of the research provided indicated that various equal, but different, segments of a creative may be roughly equivalent in terms of impact and value. Finally, there was feedback that tracking, considering and weighting creative viewable duration discretely may be sufficiently complex to require significant modifications to the current ad tech ecosystem. On the other hand, the absolute duration weighting approach, by definition, favors sheer "tonnage" of time, and thus can be seen as bringing with it a bias in favor of longer form video ads, which may be likely to achieve higher duration weighted results simply by merit of their *de facto* ability to accumulate longer increments of time duration.

However, after the public comment review phase of these Standards, there was strong industry and working group participant feedback that favored simple or relative duration weighting. This feedback represented the large majority of that received related to this issue and indicated

¹ Goldstein, D., McAfee, R., & Suri, S. (2011). *The Effects of Exposure Time on Memory of Display Advertisements*
Goldstein, D., McAfee, R., & Suri, S. (2012) *Improving the Effectiveness of Time-Based Display Advertising*
Teixeira, T. (2014). *The Rising Cost of Consumer Attention: Why You Should Care, and What You Can Do about It*
IPG Media Lab, Cadreon, & Integral Ad Science. (2016). *Putting Science Behind the Standards*

relative duration weighting is more equitable for shorter form ads and presents a true measure of delivery of an ad up to its full length as designed, under the reasonable assumption that the creative has been designed with its time length in mind. Moreover, those providing feedback in favor of relative duration weighting indicated this approach was more logical and explainable than an absolute approach that uses an arbitrary fixed duration as a denominator. Finally, many television properties indicated that any potential biases to shorter form ads of a relative approach was likely minimal.

MRC recognizes that there may be biases present for either the relative or absolute duration weighting approaches and cannot ignore the potential bias toward short-form of a relative approach, regardless of whether or not media sellers of long-form ad inventory do not believe this bias to be material. MRC typically sets Standards that seek to minimize bias to the extent possible. As discussed above, the importance of standardized duration metrics warrants inclusion of such a duration weighted metric, and the relative approach represents what we believe to be, on balance, a reasonable approach, and one that also represented the largest concentration of consensus among the wide range of industry participants who took part in the effort to assist in the development of this Standard. MRC believes any potential bias of relative duration weighting can be greatly mitigated if used in accordance with guidance herein and in conjunction with ROI measures as well as required creative-level viewability and duration reporting.

Outcome and Calculation Guidance

MRC continues to believe in the value of considering and incorporating duration in cross-media video audience measurement due to previous industry research conducted, research conducted as part of setting these Standards and buyer feedback that places value on longer viewing time up to completion of an ad as it was designed. **MRC permits the reporting of combined and deduplicated cross-media video metrics on a duration weighted basis (viewable impressions, frequency and GRP) in addition to cross-media video metrics based on viewability and SIVT filtration. However, due to the complex changes necessary to widely adopt duration weighting across the ecosystem, these Standards do not currently require duration to be incorporated in cross-media video audience metrics.**

Our aspiration is that measurement systems and transactional practices are modified to allow for discrete creative and duration tracking to promote broad acceptance of duration weighted cross-media video audience metrics. **The MRC currently plans to require Duration Weighted Viewable Impressions for input into cross-media video advertising Frequency and GRP in addition to, not in replacement of, cross-media video advertising Frequency and GRP that does not incorporate Duration Weighting beginning in January 2021.**

For a broadcast orientation with a static ad model, it is not required that the ad impressions be measured discretely (although again, it is not precluded), since under this model all ads are delivered in a common way, along with content. In other words, measurement of content time or time periods (such as AQH or average minute) during the presence of commercials or ads inclusive of skipping or scrubbing as a proxy for ad delivery is permissible with the proper

granularity as stipulated in this Standard. In this situation the ad may be considered served and viewable for purposes of impression measurement (presuming other TV viewability considerations spelled out in this document are addressed). However, inability to measure and report duration metrics due to permissible less granular reporting shall be actively disclosed and should not contribute to duration weighted audience. Duration shall not be inferred when not directly measured unless based on supportable evidence demonstrating the measurement method approximates granular duration measurement. It is MRC's belief that inability to include measurement of content or time periods as a proxy for ad delivery in duration weighted audience and the increasing penetration of Dynamic Ad Insertion or DAI such as in addressable TV, will reduce the permissible use cases of less granular measurement that is not based on impressions.

Cross-media video measures that incorporate Viewability and SIVT filtration but do not incorporate Duration Weighting, even after duration-weighting is also required in January 2021, shall be reported in addition to those that incorporate Duration Weighting and would be considered compliant with the requirements of this Cross-Media Audience Standard.

For cross-media video audience measurement, total and average Viewable Duration reporting (based on unduplicated viewable duration) at the creative level is required, which allows a report user to independently calculate duration weighting if that user so chooses. Viewable completion (measurement that an ad was viewable during the entirety of length) audience metrics are also required in cross-media video measurement and are a valuable metric for confirming delivery of the full video creative length as designed. Other duration metrics such as quartiles or other binary progress metrics are permissible, but not required.

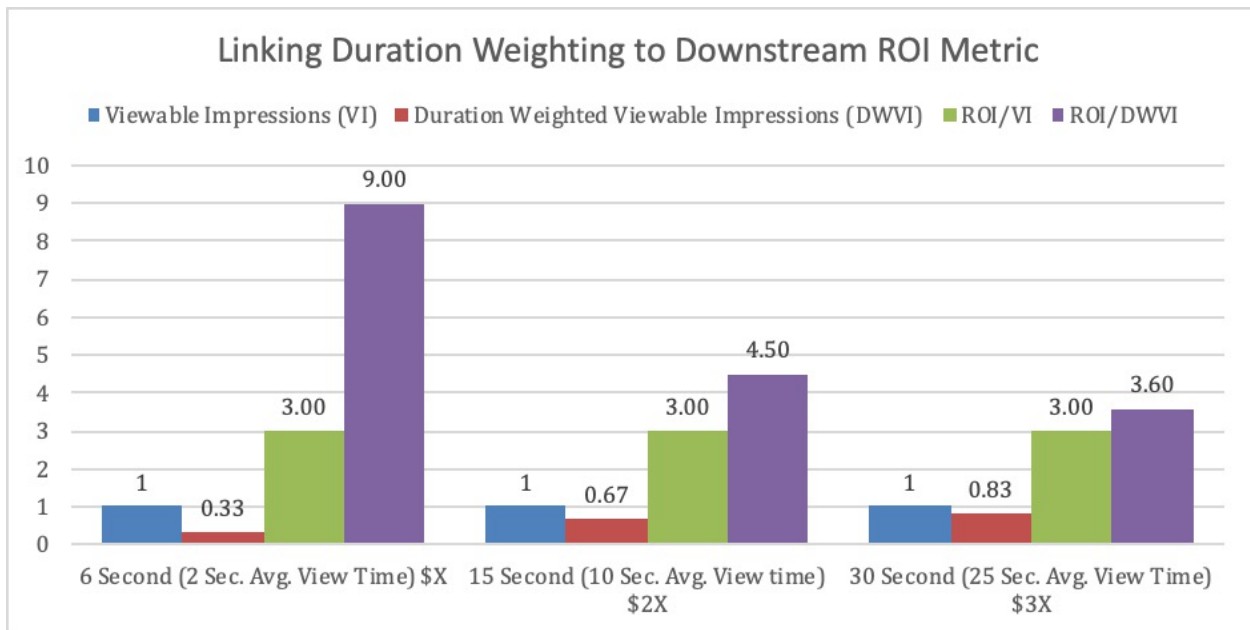
Further, if measured and reported, these Standards continue the previous Digital Audience guidance put forward in the December 2017 *Digital Audience Measurement Standards* and stipulate viewable duration weighting relative to creative length.

Again, duration weighing is NOT a measure of ad effectiveness and is not recommended to be utilized on a standalone basis in this manner. Users are, however, encouraged to utilize relative duration weighted metrics in conjunction with ad effectiveness and ROI metrics in order to enable comparative evaluation of spend, delivery and return based on campaign design and objectives. Such use of duration weighted metrics may allow isolation and identification of potential incremental value of shorter form media. For example, in the following illustration three creatives of varying length with viewable exposure with varying (but not complete) average view times assuming a direct (but not linear) relationship between ad length, cost and lift are compared on the basis of Viewable Impressions (VI) and Duration Weighted Viewable Impressions (DWVI) with corresponding Return on Investment (ROI).

Three different video creatives of 6, 15 and 30 seconds having average viewable duration of 2, 10 and 25 seconds, respectively, were compared. For illustrative purposes it was assumed that the 15 second creative had a CPM of 2X the 6 second creative and the 30 second creative

had a CPM of 3X the 2 second creative. Likewise, it was assumed the lift of each creative had the same relationship as the price.

As can be seen, DWVIs, which reflect the impact of varying viewable duration delivery, allow a comparison of varying ad durations where VIs do not (each creative delivered an average viewable impression of 1, regardless of creative length or viewable duration) and linking ROI to DWVI isolates and identifies situations where shorter duration drives greater incremental return.



MRC will be working to set standards for lift and effectiveness measures beginning in 2019 and it is our expectation that these efforts will result in a useable draft of standards for outcome metrics to allow them to be used in conjunction with duration weighting before January 2021.

During the intervening time between the finalization of this Standard and the January 2021 implementation deadline, the MRC will review research we are able to participate in directly or inspect on a detailed basis that is done related to duration value and duration weighting as well as feedback we receive on the practical uses of required duration metrics and either reaffirm or modify the requirements of this Standard related to duration weighting as discussed in this Appendix.

Under the relative duration weighting discussed above, Duration Weighted Viewable Impressions are calculated as:

$$(\sum \text{Viewable Duration}) \div (\text{Ad Unit Length})$$

Final

Duration Weighted Frequency is calculated as:

$$(\Sigma \text{ Duration Weighted Viewable Impressions}) \div (\Sigma \text{ Unique Audience with a Viewable Impression})$$

Duration Weighted Ratings are calculated as:

$$(\Sigma \text{ Duration Weighted Viewable Impressions}) \div (\text{Measured Population, Universe or Target}) \times 100$$

Total Duration Weighted GRP (DWGRP) is calculated as:

$$\Sigma \text{ Duration Weighted Gross Rating Points}$$

Or

$$\text{Reach} \times \text{Duration Weighted Frequency}$$

Or

$$[(\Sigma \text{ Duration Weighted Viewable Impressions}) \div (\text{Measured Population, Universe or Target})] \times 100$$