Interactive Advertising Bureau
Mobile Marketing Association
Media Rating Council

Mobile Application Advertising
Measurement Guidelines

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These guidelines have been developed through the joint efforts of the Interactive Advertising Bureau (IAB), the Mobile Marketing Association (MMA) and the Media Rating Council (MRC). Version 1.0 was completed with guidance from members from all three organizations.

Contributors to Version 1.0

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1.0   Scope and Applicability

These guidelines are intended to cover the measurement and disclosures related to dynamic, in-application advertisements that appear on mobile devices. These guidelines are not intended at this time to cover the following: hard-coded advertising, or sponsorships or advertising in a non-mobile environment (the nature of the environment generally can be determined based on the operating system used to access the advertisement).

This document is principally applicable to organizations involved in the mobile industry that develop mobile applications that facilitate advertising delivery to consumers. Additionally the measurement-related practices can be applied to third-party measurement organizations in the mobile industry. This guideline is intended as a guide to accepted practices, as developed by the IAB, MMA and MRC. In addition, mobile application advertising planners and buyers can use this document to assist in determining the quality of ad measurements and the completeness of disclosures.

2.0   Glossary

Ad Impression: A measurement of exposure to an in-application ad that meets established minimum thresholds for quality and the terms and conditions established between ad seller and buyer.

Application Ad Network: Ad networks that combines applications from many developers to allow an ad buyer to reach a wider audience across multiple applications.

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.

Deferred Ad Impressions: Ad Impressions that occur and are counted while a User (person) executes the application off-line. These Ad Impressions are then reported when the Client User reconnects on-line and the data for the off-line Ad Impressions are collected.

Dynamic In-Application Ads: Ads that can be dynamically changed; allowing the functionality of providing different ads across application Sessions to the same or different Users.

Event Based Ads: Ads that are generated as a result of an event in the application, typically triggered by a User's interaction with the application through the Client User.

Frequency Capping: A practice that limits the number of times an advertising message exposure (ad impression) can be billed to buyers within a campaign and/or over a specified period of time. Frequency capping may also refer to limits placed on the number of times that an ad is to be delivered to a particular user over a period of time.

Hard Coded In-Application Ads: These ads appear within the application environment but cannot be changed from Session to Session or User to User. Essentially they are "hard coded" into the application itself; these ads are not within the scope of this present set of guidelines.

Pre-Fetch Ads: Ads that are pre-loaded into an application for the purpose of storage or speeding delivery. These ads should not be counted until executed and received by the Client User.

Session: A single application-use event that spans an unspecified period of time of constant or ongoing application activity by a User through the Client User. Sessions are terminated by User actions indicating the closing of the application, or by inactivity levels that meet or exceed defined thresholds. Sessions are generally applicable to the calculation of reach metrics.

Software Development Kit (SDK) Based Measurement: 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. These SDK Based functions can be developed by a third party to the application developer and fit into the application, thereby allowing a common measurement SDK to be used across applications. In these cases certain controls, such as software development controls and software and data integrity controls may rest with the SDK developer. Integration of the SDK into the application and selection of measurement parameters or options to be used by the SDK are generally the responsibility of the Application developer or seller.

Third Party Tracking: Tracking of application activity or other user interactions, as well as advertising exposure by a third party removed from the application developer or seller. Generally these functions are not included in these guidelines, as they pertain more to a syndicated measurement function which is addressed by other measurement guidelines such as the IAB Audience Reach Guidelines or the MRC *Minimum Standards for Media Rating Research*.

User, Unique User: A person using an application and exposed to advertising messages, as determined through registration, User self-identification or some form of heuristic. A Unique User is an unduplicated person using an application and exposed to advertising messages during a reporting period. For the requirements for reporting a Unique User metric, refer to IAB's Audience Reach Measurement Guidelines, available at www.iab.com.

Viewable Ad: An advertising message that appears on a User's device in such a way that it creates an "opportunity to be seen" by the User. Whether an ad is viewable is determined by whether it meets certain pre-defined parameters; i.e., it appears on the viewable space of the mobile device screen, is not obstructed in a significant manner (for instance, is less than 50% obstructed), for a specified period of time (for example, at least one consecutive second).

3.0   Application Coverage and Basis for Projection

Applications can have varying coverage across the User population because of popularity, distribution methods, hardware and operating system compatibility limits or other factors. Therefore it is important that sellers and buyers of application-based advertising understand and consider the coverage of the application itself. This is particularly important if any form of sampling is used in the measurement of application Ad Impressions or other measured metrics. Limitations in coverage should be considered in decisions about projectability of sampled Ad Impression results originating in applications.

These guidelines require disclosure (and, if projection is being considered, quantification) of application coverage to users of advertising measurements. The following coverage areas should be described (and/or quantified), and therefore considered in the use of advertising measurements.

Disclosures should be made at the lowest level of granularity of category applicable below:

3.1 Mobile Users
The use of mobile applications is generally limited to the population of mobile-capable people within a certain geographic area, e.g., country.

3.2 Platform Compatibility (e.g., Telephone, Tablets or Other Devices)
The use of a mobile application is restricted to certain device-types within the mobile segment, as well as to certain Operating Systems within the platform(s).

3.3 Downloaded Applications (Versioning, Where Applicable)
The use of a mobile application is restricted to only those situations where the User has downloaded the application to the Client User or can otherwise access application functions. If advertising delivery, functionality or measurement methodology has been changed between versions of an application in a manner that has significantly changed the user experience with the application (and the context in which ads within the application appear), this should be specified and quantified.

3.4 Opened, Initialized Applications (Duplication Considered)
The use of a mobile application is restricted to only those situations where the downloaded application has been opened and initialized after downloading. If more than one of the same applications has been downloaded, opened and initialized by a User, and the newer application download does not replace the existing application, then duplication should be considered in the reporting of Users or in Frequency Capping situations whenever possible**.** In general, de-duplication functions should be applied over the reporting timeframe – for example, for a weekly report, users that open and initialize more than one of the same applications on the same device should be de-duplicated within that week.

3.5 Applications In-Use (Duplication Considered)
The use of a mobile application is restricted to only those situations where the opened application is in-use (either on or off-line) in a Session and advertising exposure is taking place. Similar to 3.4 above, duplication should be considered. Users of the mobile application should be de-duplicated over the reporting timeframe for this metric; for example, for a weekly report, users that are using the same application concurrently on the same device should be

de-duplicated. Significant volumes/situations of duplicated use should be investigated by the application provider/seller since this can sometimes be indicative of a processing error in initialization or usage counting functions.

4.0	**Mobile Application Ad Measurement Guidelines**

The following presents the guidance for Ad Impression counting resulting from the deliberations of participants from IAB, MMA and MRC. This guidance is applicable to in-application measurement functions, regardless of whether they are inserted through an SDK or they are native to the application itself.

4.1 Ad Impression Tracking – Technical Details

A measurement of an advertising exposure occurrence, contained within real-time or stored and transmitted application use activity records, measured at the Client side, sourced from a fully downloaded, opened, initialized application in an application Session with a Client User. The advertising exposure occurrences must meet or exceed the minimum requirements summarized below and be filtered from non-human activity where applicable.

This guideline requires measurement to be based on client-side application activity, sourced from application use activity records containing advertising exposure occurrences; the extent to which any such activity has been ascribed or inferred should be disclosed, and impressions based on inferred activity should be segregated for reporting purposes. Server-side application activity is not considered an acceptable basis for counting under these guidelines, consistent with other measurement guidelines issued by IAB, MMA, and MRC. Please refer to Appendix A of IAB's Interactive Audience Measurement and Advertising Campaign Reporting and Audit Guidelines, v.6.0b (U.S. version) located here http://www.iab.com/wp-content/uploads/2015/06/Ad-Impression-Measurment-Guideline-US.pdf for diagrams of examples of valid implementations of Client-initiated counting approaches. *Please note that effective as of March 2016, only those examples where counting follows ad content delivery are acceptable client side measurement approaches for mobile application ad impression measurement. Implementations in which counting precedes ad content delivery are no longer acceptable for mobile application ad impression measurement.*

When an ad is downloaded offscreen in advance of being displayed to the end user (for example, in the context of an ad "page" that a user would turn to in reading an article), the app or SDK must ensure that that Javascript-based tracking pixels only fire and the ad is only counted once it becomes viewable (see Section 6.3).

Physical attributes of the advertisement and the placement of the advertisement within the application should be disclosed by campaign or placement type; this disclosure can be made as part of initiating the campaign with the advertising agency or buyer. Additionally, any variable exposure attributes such as ad size of the advertising during the application Session should be described. Ads should not be counted if occluded or otherwise exposure is

impaired in a significant manner (a similar concept as "focus" in other guidelines created by IAB/MRC). Event Based Ads should be described in terms of attributes and trigger criteria.

The application measurement organization should have sufficient controls to determine that:
- The application was downloaded, opened and initialized as designed on that Client User prior to the measured Session.
- The application itself was functioning as intended during the session. Sessions and Ad Impression metrics associated with "faulted" conditions (situations of functionality issues with the application, errors or non-working conditions) should be tracked and segregated from fully functioning Sessions and Ad Impression metrics

Measured, counted Ad Impressions are generally assumed to be Viewable Ads by the User. Situations where viewability is not known or not controlled for should be disclosed, quantified and segregated for reporting purposes. Insofar as viewable decision results are concerned, these activities should be reported in three categories – (1) Viewable, (2) Non-Viewable, and as noted above, (3) Undetermined.

Changes in page orientation during application use can be tracked as a native or SDK function, however, this does not alter the parameters for counting an impression or other ad metrics, except to the extent it may change the size of the ad (for example, which may cause viewable parameters to be more or less difficult to achieve).

Instances where users are encountering application loading screens are generally not counted as application activity, nor is the loading duration considered in-app duration. In certain instances these loading screens can contain advertising messages. In general these impressions or any other measured activity associated with loading screens (e.g., duration, mouse activity, etc.) should be segregated for reporting purposes from actual application use and advertising consumed during the application's user experience.

Application transaction records, which contain evidence of advertising 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.

In situations where the connection speed of the client-user can impact counting effectiveness or the counted activity itself, the application developer or SDK developer, if applicable, should make reasonable efforts to ensure counting is accurate. Editing and error handling rules should be developed to detect, segregate and report counting situations with suspect accuracy related to connection speed.

To consider an Ad Impression valid, the time at which the ad was served must be included within the campaign reporting period and must be prior to billing for that period based on the pre-determined billing cycle.

4.1.1 Sessions

While "Sessions" as a measure is in a different category than ad impressions, it is nevertheless relevant to in-application impression measurement in that certain edits often are used for in-application impression counting purposes that are based on sessions. Sessions is also a necessary component of Reach calculations. Therefore, consideration of what constitutes an application session is appropriate here.

An application Session is measured from the start of the application to the end-time of use of the application, as long as the application does not encounter inactivity (application idle) of a pre-defined duration. These inactivity rules may vary based on the type of application involved. For instance, some applications are designed for long periods of inactivity (such as long-form video, or scoreboards, to name two examples), in which case a longer inactivity threshold may be more appropriate than in another situation where longer periods of inactivity are not normally to be expected. Or, as another example, while an application that is not in focus on the screen would usually be considered inactive (if out of focus for the pre-defined inactivity duration), in certain limited cases, such as with applications that contain audio ads, the inactivity rules may allow for the application session to be considered as still active. In all cases, inactivity rules applied must be fully documented and disclosed.

The mobile environment generally allows for a greater range of options for determining user activity than are available in traditional online environments, and these should be leveraged in making inactivity determinations. For instance, screen dims and darks, or screen touches, can be used in helping to make inactivity determinations.

Reporting of Ad Impressions should mirror the requirements as specified in the ad insertion order, and should be agreed-upon upfront. For example, if an ad is purchased across an Application Ad Network as specified in the insertion order, the resulting Ad Impressions should be reported as delivered across that network; if the ad is purchased in only a single application, the resulting impressions should be only from the applicable application.

4.2 Rich Media

Application ads can be served in a rich media format. For these instances, the requirements associated with a conventional application Ad Impression are applicable as described above. Additionally, similar to requirements in conventional Internet Rich Media Guidelines, if situations are encountered where the application does not accept a rich media version of the advertising, sufficient provisions should be made to substitute non-rich media creative or default creative. These substitution instances should be segregated for reporting purposes.

4.3 Video

Application ads can be served in a video format. For these instances, the requirements associated with a conventional application Ad Impression are applicable as described above. Additionally, similar to the requirements in conventional Internet Video Ad Guidelines, video advertising should be counted using a client-side technique only when the advertising itself starts to execute in the viewable area of the screen, post caching.

Video advertising within an application can be measured using several types of metrics:

- Video Ad Impression (served) – This metric represents the count of the first frame of the video ad, post buffering if applicable.
- Video Ad Impression (Viewable) – This metric applies certain thresholds to served impressions that must be met 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 received by the device; for example, the thresholds may dictate that a certain percentage of the advertisement must be on screen for a certain length of time in order to qualify as viewable. Industry standard thresholds for viewability are currently in development.
- Various metrics can be used to measure progress through either the video ad or the application content during the ad, which can act as a surrogate to user interest or engagement at a basic level.
- Various metrics can be used for user interactions with the video ad or the application content during the ad, which again can act as a surrogate to user interest or engagement – for example, swipes, taps, movement or hovers, changing the size of the content, etc.

5.0   Application Development, Testing and Release Processes

The general internal controls present at the organization that develops or approves the application for release are a critical component of the overall operating effectiveness of advertising measurement associated with the application. These controls do not have to necessarily reside at the original application development/programming facility; however, certain levels of quality control should be present at some stage of application rollout. Ultimately it is the responsibility of the advertising measurement organization to ensure that proper testing and release processes are followed and that controlled development processes were employed in building the original application.

In general, the advertising measurement organization should have sufficient controls to ensure:

- Development of and changes to applications are authorized, tested and approved prior to being rolled out for User download (release). Segregation of versions should be maintained where advertising functionality has been changed.
- Access to application software associated with advertising, storage of ads, ad placement and serving functionality is restricted to authorized personnel (non User) and programs. Users should not have the ability to alter advertising content.

- Advertising related user-set parameters are documented, recorded and included in data transmissions back to the measurement organization if changed.
- The application is documented, and advertising associated functionality is documented.
- Only authorized served ad content is accepted as input by the application, regardless of whether that content is served real-time or stored for later use.
- Any calculations or data accumulation processes within the application have been tested for efficacy.
- Data transmissions from applications (whether real-time or batched) are complete, accurate and protected from modification.
- Errors and advertising data rejected for quality purposes is logged, evidence supporting the error is retained and errors are followed up on to correct potential cases of systematic or recurring issues.

In SDK oriented measurement environments, the application developer or seller should have sufficient confidence that the above controls are maintained for the SDK functionality. Development of this confidence can encompass a periodic review and/or testing conducted by the application developer, in which case the application developer then is taking responsibility for the controls at the SDK developer. Another approach is for the SDK developer to itself be audited by a third party with some form of observable assurance provided such as certification, accreditation or a third-party CPA attestation. In this latter case, if the application developer is looking to become certified or accredited itself, the auditing organization can build a case for relying of the SDK assurance (depending on conditions of that assurance).

6.0	**Enhancing Mobile Application Ad Impression Tracking Accuracy**

The following areas should be considered when creating audience measurement metrics for application and in evaluating these metrics:

6.1 Cache Busting
Advertising exposure instances should be counted across all ad request activity, regardless of whether the advertising or application functionality has been stored in cache. Accordingly, if cache techniques can impact Ad Impression counting, cache-busting techniques should be employed. Similar to general Internet cache busting techniques, this can be accomplished by including a unique identifier in the advertising call/string; or using another technique for stopping the cache function.

6.2 Filtration for Non-Human Activity
Although non-human activity associated with advertising within applications may be more limited than in conventional digital modes (such as web or mobile-web), it is important to give consideration to, and employ, if applicable, filtration techniques to eliminate Ad Impressions or other advertising activity from non-human agents.

If non-human activity can be encountered in executing the application, therefore causing non-human Ad Impressions or other metrics, then filtration techniques should be used.

6.3 Segregation of Pre-Fetch Advertising

As stated earlier, ad content that is pre-fetch or stored within the application or elsewhere on the Client User should not be counted as valid Ad Impressions or included in other metrics until viewable by the User. SDKs that load the ad in the background must ensure that the Javascript responsible for incrementing the impression count does not execute before the ad is visible.[1]

6.4 Auto Refreshed Ads

Ads within the application that are auto-refreshed should be counted as valid ad impressions if they meet the requirements for impression measurement. However, if the auto-refresh settings are set by the application (or SDK) and not by the user, and if the resulting impressions constitute a material amount of total impressions, this practice should be disclosed and the counts should be segregated for reporting purposes. Also, the rate at which ads are auto-refreshed should be assessed for reasonableness, considering the environments in which the ads appear.

6.5 Auto-Play Display Ads and Video

Auto-play display Ad Impressions and Video (executed automatically outside of the intentions of the User) should be segregated for reporting purposes if material (exceeding 5% of reported impressions for the campaign for the reporting period). These auto play impressions (assuming they are viewable) are valid to count because the User may have seen them; however, the uncertainty around engagement and the lack of User initiation of the impression cause the need for this segregation.

6.6 On-Line vs. Off-Line Activity

Ad Impression activity can be counted regardless of whether the exposure occurred when the User was on-line or off-line, however the nature of Deferred Ad Impressions or other off-line activity should be described, quantified and segregated for reporting purposes.

Ad impressions resulting from off-line, stored, and later transmitted activity ("Deferred Ad Impressions") must have occurred within the campaign reporting period. Also, the reported ad impression must have occurred before the final bill for the campaign period, based on the pre-determined billing schedule as agreed to upfront between the buyer and seller. Thereafter, this activity should be considered expired.

6.7 Integrated Application vs. Non-Integrated Application Ad Functionality and Measurement Differences

If application functionality, including advertising content available, advertising placements or other functions differs depending on the type of device being used, these differences should be described, quantified and segregated for reporting purposes. If these functionality differences are triggered by the compatibility of the application with certain authorized hardware this situation should also be described in the context of application coverage.

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[1] For example, for ads and ad containers using the IAB's MRAID standard, the ad-counting Javascript should not fire until the ad confirms that the viewable stateChange has occurred.

6.8 Accumulating Compatible Advertising Across Mobile Platforms

Advertising exposures and other metrics should be reported as homogenously as possible (in groups or line-items), if executions and ad content is variable across mobile platforms.

6.9 Inactivity Considerations and Limits (Session Calculation Only)

An application Session is measured from the start of the application to the end-time of use of the application, as long as the application does not encounter inactivity (application idle) of a pre-defined duration. As noted in Sec. 4.1.1, these inactivity rules may vary based on the type of application involved; for instance, some applications are designed for long periods of inactivity (such as long-form video, or scoreboards, to name two examples), in which case a longer inactivity threshold may be more appropriate than in another situation where longer periods of inactivity are not normally to be expected. In all cases, inactivity rules applied must be fully documented and disclosed.

The mobile environment generally allows for a greater range of options for determining user activity than are available in traditional online environments, and these should be leveraged in making inactivity determinations. For instance, screen dims and darks, or screen touches, can be used in helping to make inactivity determinations.

6.10 Emerging Considerations

The following conditions are emerging in the application marketplace and therefore may contribute to changes in measurement metrics, methodology and disclosures. Application measurement organizations should consider these matters; the attribute of full disclosure is critical in emerging areas.

6.10.1 Front Facing Cameras

Certain mobile devices have front facing cameras which are being considered for use in gaining additional measurement metrics.

6.10.2 Advanced Advertising (e.g., HTML5)

HTML5 is bringing additional functionality, measurement tracking methods and accountability to the mobile measurement space. HTML5 advertising implementations may also bring additional complexities to the measurement process, in that ads may consist of multiple files, rather than a single file, and therefore the complete ad may load in stages rather than all at once. We suggest future study be undertaken to determine the potential impact of HTML5 implementations on the counting approaches that are required under these guidelines. If it is determined that additional guidance is necessary in order to appropriately consider the unique attributes of HTML5 advertising implementations in the mobile application environment, this guidance will be provided in a future update to this initial version of these guidelines.

6.10.3 Targeting

The registration and self-identification nature of application usage lends itself to enhanced targeting functions. Development of these functions is encouraged;

however, strong caution insofar as compliance with privacy regulations should be considered. Privacy regulations as they emerge should be monitored and staged for the application measurement organization as soon as known. Publicly available privacy policy documents are encouraged.

7.0 User Initiated Ad Actions or Information Gathering

Guidance on the measurement of user-initiated actions related to in-application advertising will be propagated at a later time subsequent to the initial release of this document.

8.0 General Reporting Parameters

8.1 General Parameters

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

In order to provide for more standardization in mobile application 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 should be defined and applied.

8.2 Time

Day — 12:00 midnight to 12:00 midnight

Time Zone – Full disclosure of the time-zone used to produce the measurement report is required. In addition, it is preferable, although not a current compliance requirement, for certified publishers or ad servers to have the ability to produce audience 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-zone, for non US-based reports this is recommended to be GMT.

Week — Monday through Sunday

Weekparts — 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.

Additional Recommendation: Dayparts – Mobile usage patterns need further analysis to determine the usefulness of establishing effective and logical standardized reporting dayparts. We encourage such analysis to determine the need for standardization of this measurement parameter.

8.3 Location

8.3.1 Traditional Geo-Location Methods

If information about the geographic location of the users is collected using traditional geo-location methods (for instance, using registration information or IP-based data from a third-party vendor to determine the location of the user), and this information is used in reporting, any limitations to the methods used should be disclosed. Ambiguities in wireless operator routing should be accounted for in location determination and estimated through processes derived from carrier/ad server cooperation.

8.3.2 Application Location Services

If information about the geographic location of the users is collected using application location services (such as GPS-enabled user location determination, or another application-based means), and this information is used in reporting, the method used and any known limitations to it should be disclosed.

8.4 Segregating Non-Like Ad Content

For reporting purposes, measurements for a campaign should be segregated by the various types of ads included in the campaign. For instance, counts should be reported separately for ads within the campaign of different sizes or functionalities.

9.0 Disclosure Guidance

Media companies and ad serving organizations should fully disclose their ad impression recording process to buyers and other users of the ad impression count data. An organization's methodology for accumulating mobile advertising measurements should be fully described to users of the data. Specifically, the nature of 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 should be included in the disclosure.

The following presents examples of the types of information disclosed.

Nature of Mobile Advertising Measurements

- Name and Type of Application Included in the Measurement
    - o (Note: The name of the application is required in situations when reporting is done by application. In situations where reports cover network buys that include blind buys across multiple applications, the name(s) of the application(s) included in the measurement is not required to be disclosed.)
- Name of Measurement Report
- Type of Measurements Reported
    - o Time Periods Included
    - o Days Included
    - o Basis for Measurement
    - o Geographic Areas
    - o Significant Sub-Groupings of Data
        - o Demographic categories
- Formats of Reported Data
- Special Promotions Impacting Measurements
- Nature of Auditing Applied and Directions to Access to Audit Report
- Sampling/Projections Used
    - o Sampling Methods Used
    - o Explanation of Projection Methods

Data Collection Methods Employed
- Method of Data Collection
    - o Logging Method
    - o Logging Frequency
    - o Logging Capture Point
- Types of Data Collected
    - o Contents of Log Files
- Contacts with Users (if applicable)
- Research on Accuracy of Basic Data
    - o Cookie Participation Percentages (if applicable)
    - o Latency Estimates
- Rate of Response (if applicable)

Editing or Data Adjustment Procedures
- Checking Records for Completeness
- Consistency Checks
- Accuracy Checks
- Rules for Handling Inconsistencies
- Circumstances for Discarding Data
- Handling of Partial Data Records
    - o Ascription Procedures

Computation of Reported Results
- Description of How Estimates are Calculated
    - o Illustrations are desirable

- Weighting Techniques (if applicable)
- Verification or Quality Control Checks in Data Processing Operations
- Pre-Release Quality Controls
- Reprocessing or Error Correction Rules

Reporting Standards (if applicable)
- Requirements for Inclusion in Reports, Based on Minimum Activity Levels

Reliability of Results
- Sampling Error (if applicable)

Data retention rules
- Maintaining sufficient data or processes that allow for audit trail

Limitations on Data Use
- Non-sampling Error
- Errors or Unusual Conditions Noted in Reporting Period
- Limitations of Measurements

10.0   Auditing Guidelines

10.1 General

Third-party independent auditing is encouraged for all ad-serving applications used in the buying and selling process. This auditing is recommended to include both counting methods 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 of filtration procedures and measurement recalculations. Activity audits can be executed at the campaign level, verifying the activity associated with a specific ad creative being delivered for performance measurement purposes.

> 2. Processes/Controls: Examination of the internal controls surrounding the ad delivery, recording and measurement process. Process auditing includes examination of the adequacy of site or ad-server applied filtration techniques. Although audit reports can be issued as infrequently as once per year, some audit testing should extend to more than one period during the year to assure internal controls are maintained. Audit reports should clearly state the periods covered by the underlying audit testing and the period covered by the resulting certification.

10.2 U.S. Certification Recommendation

All ad-serving applications used in the buying and selling process are recommended to be certified as compliant with these guidelines at minimum annually. This recommendation is strongly supported by the American Association of Advertising Agencies (4As) and other members of the buying community, for consideration of measurements as "currency."

Special Auditing Guidance for Outsourced Ad-Serving Software
Ad serving organizations that market ad serving/delivery software to publishers for use by the publisher's IT infrastructure (i.e., "outsourced") should consider the following additional guidance:

> 1. The standardized ad-serving software should be certified on a one-time basis at the ad serving organization, and this certification is applied to each customer. This centralized certification is required at minimum annually.

> 2. Each customer's infrastructure (and any modifications that customer has made to the ad serving software, if any) should be individually audited to assure continued functioning of the software and the presence of appropriate internal controls. Processes performed in the centralized certification applicable to the outsourced software are generally not re-performed. The assessment of customer internal controls (and modifications made to outsourced software, if any) is also recommended to be at minimum an annual procedure. These certification procedures are only necessary for outsource clients who wish to present their measurements for use by buyers.

Special Auditing Guidance for Advertising Agencies or Other Buying Organizations

If buying organizations modify or otherwise manipulate measurements from certified publishers or ad-servers after receipt, auditing of these activities should be considered.

In addition to MRC and its congressional supported certification process for the broadcast industry, there are a number of other certifiers and types and levels of certification available to ad serving organizations.

10.3 European/Additional Region/Country Certification Recommendation

The MMA, IAB, and MRC encourage non-U.S. measurers of in-application advertising activity to adopt the practices spelled out in these guidelines. 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..

11.0   Who We Are

About the Mobile Marketing Association

The MMA is the world's leading global non-profit trade association comprised of more than 800 member companies, from nearly fifty countries around the world. Our members hail from every faction of the mobile marketing ecosystem including brand marketers, agencies, mobile technology platforms, media companies, operators and others. The MMA's mission is to accelerate the transformation and innovation of marketing through mobile, driving business growth with closer and stronger consumer engagement. Anchoring the MMA's mission are four core pillars: Cultivating Inspiration, Building Capabilities for Success, Demonstrating Measurement and Impact, and Advocacy. The MMA's global headquarters are located in New York and it has regional operations in Europe/Middle East/Africa (EMEA), Latin American (LATAM) and Asia Pacific (APAC), with local councils in 17 countries. For more information, please visit www.mmaglobal.com.

About the IAB (U.S.)

The Interactive Advertising Bureau (IAB) empowers the media and marketing industries to thrive in the digital economy. It is comprised of more than 650 leading media and technology companies that are responsible for selling, delivering, and optimizing digital advertising or marketing campaigns. Together, they account for 86 percent of online advertising in the United States. Working with its member companies, IAB develops technical standards and best practices and fields critical research on interactive advertising, while also educating brands, agencies, and the wider business community on the importance of digital marketing. The organization 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., IAB 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 and has a West Coast office in San Francisco.For more information, please visit www.iab.com.

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.