GLOBAL OOH AUDIENCE MEASUREMENT GUIDELINES

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“Collaboration” is one of the cornerstones of The World Out of Home Organization – working collaboratively towards the common goal of growing the OOH medium across the globe has been a key tenant of my Presidency of WOO - these guidelines epitomise that principle of collective benefit.

No one should underestimate the level of experience and expertise assembled to put together these guidelines. Eleven National OOH measurement bodies from across the world, alongside four international OOH businesses, and others, have collaborated to create them – willingly sharing their knowledge and experience for the benefit of other members in territories everywhere.

To fully value the contribution that OOH media delivers for advertisers, it needs to be measured in a transparent and credible manner. Developing OOH audience metrics allows our medium to command the revenue share it deservers from advertisers’ budgets, and demonstrates the exceptional value delivered by OOH alongside other broadcast and performance media –driving growth and market share for OOH.

So, I’d like to take this opportunity to personally thank all of our contributors, for giving their time and knowledge to allow us to collaboratively create these guidelines to promote OOH everywhere.

Tom Goddard - President

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Foreword by our Chairperson:

Coming out of a difficult period for OOH advertising it is more important than ever before that the industry collaborates on a range of initiatives to firmly establish the benefits of the medium to buyers. While it is tempting to see digital OOH as different to the classical form of the medium, in many ways it is not and the two are often bought together. In measuring exposure to the different forms of the medium, it is important therefore that the industry approach is as cohesive as possible across all OOH formats.

These guidelines are a review of best practice by Joint Industry Currency initiatives throughout the world, and their attempt to tackle measurement issues arising from the developing commercial imperatives imposed by an increasingly digital advertising market, both in OOH and the wider industry, and the inevitable pressure towards automated and ultimately programmatic trading. By this collaboration the industry provides a route to credibility and ultimately growth in sales.

Important new initiatives from the WFA and their national representative bodies, such as Project Origin, demonstrate the need for openness and transparency in accounting for the placing of advertisers' money. Focus in this area is critical within all forms of OOH if the industry is to be valued in the cross-media measurements that are currently in the pipeline, even if they are at an early stage. The OOH medium led the advertising industry in developing attention-based metrics to tackle the difficulties of comparing the very different formats and locations inherent in its offer, an approach that is fundamentally people rather than device based. Whether developing an existing industry approach or just beginning, these guidelines benefit from the considerable thought and development in creating transparent measurement over the past 30 years and contextualise the latest thinking.

Neil Eddleston – Chair of the WOO Guidelines Committee

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1.1. Statement of Approach and Principles:

The intention of these guidelines is to build upon the existing body of work available, most notably the ESOMAR Global Guidelines for OOH Measurement published in 2009 in association with the World Out of Home Organization (formerly FEPE). These guidelines aim to update areas of the previous work, specifically in the areas of Digital Out-of-Home; Contemporising Audience data; and Cross Media Measurement.

Outline guidance for complete OOH measurement is included here for context, although more detail in specific areas of modelling and measurement can be found in the recommended reading section towards the back of this document.

The World Out of Home Organization (WOO) has intended this document to be a set of guidelines rather than standards, and we outline the areas of importance in creating transparent and trusted data for the use in the measurement and trading of OOH media. Each OOH territory will have its own constraints on funding, complete industry involvement and the availability of external data, so this guide should be used in local context.
The journey to a complete understanding of all OOH frames and the audience they deliver is a long one, but it is a journey well worth embarking upon, with many stages and junctions which can be achieved, celebrated, and monetised along the way.

WOO has always been committed to the promotion of the OOH industry, through the collaboration of its members. Audience measurement represents a key area where OOH practitioners and associations can work together to promote the increased usage of OOH media in all of its forms. Accountable OOH audience delivery metrics add value to the overall proposition of OOH to advertisers - increasing the revenue to OOH media owners and, in turn, the investment available to develop the industry further.

WOO sees collaboration as a cornerstone of the organisation, and believe that shared learnings in OOH audience measurement is key in the industry's future success. However, in some territories, the path towards OOH measurement may be embarked upon by an individual company or small group of practitioners – following good governance from the start will help in both the credibility of the data but also in gathering other contributors to the project as it evolves.

WOO has worked with OOH audience measurement bodies from across the world to understand the approaches being deployed today and those that are in development. These approaches have been used to develop these guidelines alongside previous guidance – each territory has an approach best suited for their physical and organisational structures and many have developed over time, so no two approaches are identical, but all have common aims. A summary of the approaches examined is also included, alongside contact details of the organisations that have been generous enough in helping us compile these guidelines.

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The organisations involved in producing these guidelines are:

International Media Owners
Clear Channel
JCDecaux

International Media Buyers
Posterscope/PSI
Talon

National audience measurement bodies
Australia – MOVE
Belgium – CIM
Canada – COMMB
Germany – ma Out of Home
Japan – DSC (LIVE BOARD)
New Zealand – Calibre
South Africa – Out of Home Measurement Council
Sweden - Outdoor Impact
Switzerland – Swiss Poster Research Plus
UK – Route
US – Geopath

Other representation
LatAm – ALOOH
China - BNR Communications

1.2. Governance:

Ideally, audience measurement to be used as currency should involve all interested parties from across the industry – OOH Media Owners, OOH Media Buyers, alongside Advertiser and Agency representatives – both as individual companies but also as associations to represent the interests of the widest possible group.

A decision making and funding body may be a subset of this group but should include representation from each area of the business.

This decision making body may also wish to appoint a Technical Committee to advise on the appointment of any external suppliers and to scrutinise the work undertaken. The Technical Committee should also be representative of the interested parties and may also employ external expertise to advise where required. The committee's role will be in understanding both the users' needs and ensuring that all aspects of the research and modelling are open to scrutiny. Ensuring effective auditing, accreditation and quality control systems are in place would also fall to this group, giving them oversight of the performance of external research or data suppliers.

Alternatively, a smaller group of interested parties may form to embark upon OOH audience measurement, whilst applying the principles of transparency from the start will help the adoption of new members as the project evolves. The South African ROAD approach was initially set up and funded by four stakeholders and expanded to now involve more than 30.

Credible audience measurement may also be delivered initially by a single company and adopted across the industry if the principles of transparency and scientific rigour are maintained from the outset. The New Zealand Calibre approach was initially set up by a single media owner and has recently been adopted across the market as a whole.

1.3. Funding, Access and Transparency:

Out of Home audience measurement is not an easy, or low cost task. Project design and management, alongside oversight, will require resources. Selecting research and data providers should be done through open tender for transparency, and may require a long term financial commitment from the funding body to embark upon the work. So stable long term funding arrangements should be secured to allow for the project to be developed and delivered.

Ideally the security of funding should be agreed across the widest group of end users at the outset, although a core group may start the project and bring in additional stakeholders as the data becomes available. Consideration should be made to the value gained from use of the data in relation to the fees or commitments sought. As the benefit of OOH audience metrics – increased use of OOH media – will be reaped by media owners and specialist OOH media agencies, the initial investment burden should be shared proportionately with the ultimate returns. Likewise ongoing funding should be in proportion to the organisations size or use of the data.

As metrics are predominantly a benefit to OOH companies, the wide usage of those metrics by advertisers, agencies and other advisers should be promoted. Any costs to these organisations should be minimised to encourage the use of both the data and the medium.

The exact funding and governance structure will be determined by local market conditions, but it is recommended that access to the data should be equal for different user groups – both to avoid anti-competitive practices, and to ensure the openness of the system – promoting even trading conditions across all parties in the market. User representatives, whether funding or otherwise, should have an effective say over the data and services provided – to ensure that the service is appropriate for their needs and to ensure that future development requirements are captured for consideration.

Data and research suppliers must ensure, and warrant, that their practices comply with all relevant regulations and codes of conduct and should share their methodology with the audience body. Ownership of the methodological

IP, processes, documentation and input data should be agreed and clearly stated in the tender and financing process.

1.4. The use of Personally Identifiable Information:

Almost all audience research projects, and especially those that track individuals movements and locations, involve the capture and retention of personally identifiable information (PII). It is critical that the audience body ensures its suppliers comply with all local regulation in relation to PII and to other territories regulations where they apply to their citizens across the world.

It is recommended that the audience body seeks legal expertise in the capture, retention and use of PII and submits to regular audits to demonstrate compliance. All suppliers used by the audience body should also be able to declare, and demonstrate through regular audit, that they remain compliant to all applicable regulations that governs how institutions collect, record, use, disclose, store, alter, disseminate, and process the personal data of individuals. Additionally, to have documented processes to notify the relevant authority in the case of a data breach, and accommodate the rights of data subjects, including rights to access, rectification, erasure, restricting processing, data portability, and rights in relation to automated decision-making and profiles.

A PII compliance audit should be conducted by an accredited body and address:

- Data governance
- Acquiring, identifying and classifying personal data
- Managing personal data risk
- Managing personal data security
- Managing the personal data supply chain
- Managing incidents and breaches, create and maintain awareness
- Properly organising a data privacy organisation within your institution

2.1. An overview of the required inputs for the measurement of OOH media:

There are multiple approaches to building credible OOH Audience Measurement and delivering those data to end users. The approach used will depend as much on market composition and available data, as the budget available to conduct the project. However, with an overall knowledge of what is required for the complete process, including enhanced metrics, a project can be properly planned to deliver useful metrics during its development. Delivering usable data to investors and stakeholders at each stage may help in maintaining investment through subsequent developments.

A hierarchy of metrics, or stages in development, could be seen as this, each with its own use case:-

- How many people are passing OOH frames – Volume of audience available.
- How many people are seeing those OOH frames – Delivered volume of audience.
- Who is seeing those OOH frames – Demography and audience profiling.
- How often are they seeing those OOH frames – Reach and Frequency modelling.
- Of those, who has seen an individual 'spot' – Granularity require for measuring DOOH.
- What was the actual performance – contemporised delivery against predicted delivery.
- How does OOH contribute to the complete media campaign – Cross media measurement.

Below are the key requirements to deliver across all these stages; understanding the needs for later stages allows for the consideration of those requirements when delivering earlier stages.

2.1.1. Population/volume/OTS, captures details of traffic and pedestrian flows from a range of sources.

Best practice currently involves the merging of a variety of different data layers. One of these fundamental layers is the absolute volume of people passing each advertising face, the potential audience volume. Count data of audience volumes can be gathered from multiple sources such as government or transport authorities, from transit operators, from landlords or from media owners. Additionally, count data products may also be available in market, such as HERE traffic volumes for vehicles. The method for gathering these counts should be validated and understood to apply weightings to more credible or more recent counts.

The cost of importing different datasets on traffic flows begins with locating data sources and then testing the data for quality and accuracy. Costs are dependent on the number and quality of data sources employed, which can

be managed by users. Where such data are limited or unavailable, traffic and pedestrian surveys can be carried out as 1st party count data, gathered from, for example, manual counts, cameras or purpose-built count stations. Whilst 3rd party data can be used to estimate counts of people or vehicles at any point of time – data such as telco, SDK (mobile location data) or satellite imagery – the method of gathering these data and any imputation or up-stream modelling must be fully transparent for validation. Where possible, 3rd party data should be scrutinised in raw count form alongside any cleaned or processed data to allow for validation of those processes

Volume counts will not be available for every OOH location, or for all time periods needing to be measured, so a model will need to be developed to estimate counts for all locations with OOH frames. Modelling audience flows and volumes from limited count data will rely on a detailed understanding of the road and transit infrastructure, with associated Points of Interest (POI).

Inferring audience volumes for all road or transit 'links' where OOH exists may require limited modelling from existing counts, but where OOH locations are widespread and dispersed, a model that calculates audience volumes for all 'links' irrespective of OOH locations may be more appropriate.

2.1.2. Visibility Adjustment, where the relative viewing of different types of posters can be assessed and integrated into the measurement results.

With an understanding of the number of people and their profiles passing any OOH frame it is important to understand what proportion of that audience are likely to see advertising upon it. Visibility adjustment (VA) applied consistently across all OOH frames by the measurement body removes the application of adjustments being done in an uncontrolled ad hoc manner by buying agencies or advertisers, often discounting well below the actual audience delivered. Inconstant adjustments applied by different advertisers leads to inconsistent use of the data and disagreement on the actual delivery of OOH.

The use of Visually Adjusted Contacts (VAC) is applied commonly, but not universally by industry bodies for describing audience consumption for OOH. The metric is a stringent one and is only recently being applied to other media metrics as 'Attention' becomes more widely accepted as a requirement in audience measurement, however OOH has led this approach as the majority of OOH media is passively engaged by the audience. With no editorial or content to either draw or distract the viewer from the OOH advertisement, it is important to be able to demonstrate to advertisers that audience delivered in the metrics are as close to actual audience consumption of the advertisement as possible.

The terminology for defining the VA applied varies by territory – see 'Measurement Definitions' – so it remains important to define the actual VA approach being used. A number of broad approaches exist to define the proportion of those that have been near an OOH frame to represent the frame's audience -

- Circulation - the audience count in proximity to an OOH frame
- Opportunity to see (OTS) – audience in front of an OOH Frame, or defined to be in the area that the frame can be viewed from.
- Opportunity to Contact (OTC) – sometimes referred to as 'Realistic Opportunity to See' (ROTS), which the audience is in the area that the frame can be viewed from, and where their direction of travel places the frame in their field of view, free of any obstruction, within agreed maximum and minimum visibility distances for the size of frame.
- Visually Adjusted Contact (VAC) or 'Impact' – a probabilistic model based on visibility research to determine what proportion of those with an Opportunity to Contact, will actually look at the OOH frame for an agreed period of time. Elements key to deriving this probability of attention include, size of frame, orientation to frame, distance from central field of view, duration of contact, audience mode of transport.

Understanding VAC is seen as critically important for OOH media as it is more often observed or consumed passively by the audience, free of either the distraction or draw of editorial content common in most other display advertising media.

This higher 'bar' that is commonly used in OOH measurement has traditionally allowed OOH practitioners to counter the claim that 'people don't look at posters' by using scientific research to demonstrate that they do. Visibility Adjustment (VA) also allows a more favourable valuation of OOH inventory that has visual scale, is well positioned for the audience in that environment, is illuminated or has dynamic movement within the display frame. By applying VA advertisers can fully understand the value of OOH, and media owners can be rewarded for their investment in the quality of their inventory.

More recently the importance of VAC is highlighted by the increase in the development of Digital OOH faces where multiple advertisements can be seen by each audience member. This multiplier effect and increased valuation can only be fully realised by understanding how many messages the audience individually consumes as they pass the DOOH face and assessing the increased attractiveness of the digital delivery mechanism itself.

Visibility research studies have been carried out in several countries using different forms of prompt material and include both laboratory based and real world approaches. The common aim is to understand the factors that influence attention and their combined influence in a multitude of scenarios that can then be applied to all OOH faces being measured. Common factors that have been shown to influence visual attractiveness include:

- Size of frame
- Illumination type
- Illumination and latitude/seasonality
- Maximum visibility distance
- Orientation to the audience's direction of travel

- Distance from central field of view – horizontal and vertical
- Exposure time
- Speed of audience movement
- Audience mode of travel
- Dynamic changes in advertising image
- Visual clutter
- Visual obstruction

2.1.3. Travel survey (sample size, frequency) where the journeys people make outside their homes are tracked in detail.

In the absence of Census data of population movements, there is generally a requirement for a travel survey to understand the general mobility of the population being measured. This is needed to predict the profile of the audience passing any OOH advertising face, and to calculate the reach and frequency of exposure for individual faces and networks of faces.

The highest quality of survey will be research based and use techniques to ensure its representation of the total population. The correct sample size will depend on the size and complexity of the populations to be measured. This is likely to be the highest variable cost in any OOH audience model. In some cases, demographics may be inferred but this is likely to come with assumptions and a resultant reduction in accuracy. The importance of this will vary by country.

The lowest cost direct travel survey research option is simply to ask people about the journeys they have taken on the previous day or for longer periods in a diary model, recruiting a sample through standard research techniques.

Passive approaches, which do not rely on respondent recall, are more accurate and capture more travel behaviour, and if accompanied with second-by-second readings, can be used to understand travel mode, speed and angle of incidence in approaching OOH frames – critical in calculating the visibility or likelihood to see an OOH advertisement.

Passive data capture includes using a dedicated Smartphone-based solution where people are asked to download a tracking tool. The app monitors locations at regular intervals using GPS from which journeys can then be calculated. Smartphone locational tracking data are more accurate outside of buildings so some behavioural modelling of journeys for interior environments will still be required with this approach.

Higher quality tracking for interior and exterior movement can be achieved with a representative sample of people carrying a bespoke meter for a period of time. The advantage of a bespoke meter is that it may be designed to use multiple sensors and a more robust battery, to accurately determine its location second by second, in all settings over an extended period of time - including height above or below ground - especially useful in understanding multi story retail and underground transit environments. These additional

sensors may include a digital accelerometer, gyroscope, barometer, magnetometer, thermometer, and wi-fi, alongside GPS – all synchronised by time code.

Due to the relatively high cost of research based approaches, 3rd party data sets may be used to approximate travel behaviour for a proportion of the population. Sample representation bias, data accuracy and data completeness must be understood and minimised in the output data where 3rd party data sets are used in place of a travel survey.

When selecting 3rd party datasets, it is imperative to consider the security of that data supply - building a measurement model based on data that may not be available in the medium to long term is analogous to building a house upon shifting sands. Consider whether data is privacy compliant and that legislation yet to be adopted will not affect its supply, volume or quality – ensure that your suppliers comply with relevant regulations and are audited to demonstrate as much. Any 3rd party data source also has the theoretical potential for interruption in supply, or cost inflation, so consideration also should be given to the supplier's corporate robustness, whilst agreements on acceptable long term cost inflation should be sought.

With any approach to gathering travel data and journey patterns, there will be a need for further modelling to represent the movement patterns of the entire population over an extended period and across all measured OOH environments. Understanding reach from the survey period feeds into these models to predict longer term and combined reach by audience subgroup.

2.1.4. Inventory Characteristics where details of each frame to be measured are stored.

The characteristics and precise location of an OOH frame heavily influence the audience available to view it and therefore it is critical that inventory characteristics are accurately recorded, audited, and are open to peer review.

The characteristics required for modelling audience delivery are a core requirement here, but other characteristics that are used in market for trading and production of posters/creative assets may also be recorded centrally in standardised form, for benefits outside of audience measurement.

The precise location of every OOH frame will require it to be placed on a unified map or 'graph' of every OOH environment measured, and ideally use the same source as the mapping used for determining audience flows and volumes. Locating an OOH frame on this map may be done initially by use of GPS coordinates but is likely to need manual intervention to locate the frame precisely with orientation, altitude and setback from audience flows.

A system to allow media owners to upload inventory details including locational photographs is a core feature of OOH audience measurement. This system may be managed by the audience measurement body, by the media owners' trade association or an independent 3rd party. Flexibility, ease of use and security should be considered in commissioning or designing an Inventory Mapping System. The process and responsibility, for verifying

and auditing inventory characteristics will also need to be agreed, including ensuring that both the database and individual frame characteristics are kept up to date.

2.1.5. A method and system to process all these data into usable information.

The calculation of audience, reach, frequency and profile is central to the utility of the measurement system, so the assumptions that underlie the reach model must be reasonable, transparent and documented for scrutiny.

The initial sample size must be adequate for the granularity of outputs required and may need to be augmented with further geographical and temporal data to understand reach beyond the survey period. Where these data are unavailable and long term reach is based on simulation, the approach must be based on systematic and logical procedures which can be tested by empirical analysis.

In principle, reach and profile is calculated by observing the contacts between the audience and advertising face that are achieved against the sample for any given OOH frame or selection of frames for the time period of the advertisement's display. Then weighting this delivery to correspond with the proportional weight, and profile, of each sample participant.

In practice the sample will not be sufficient to have enough contacts against every frame being measured for every incremental time period, even where a multi-year survey period is used. So a method of redistributing a proportion the contacts from the sample across all frames will be required. There are several approaches that may be used for this, but most rely on grouping frames (by similar attributes and geography) and applying a statistical model that correlates with the observed data but allows for estimating the effect on the audience from frames with few or no audience contacts. This can then be validated and refined against the number of individuals passing a frame from known or modelled counts.

Alternatively, the initial sample may be used to create a modelled audience, of many millions of synthetic individuals that represent contacts with all frames, across all time segments. Although this requires advanced modelling and machine learning techniques, these synthetic media consumers each have statistically accurate and representative journey behaviours and can therefore be treated as very low weight individuals in calculating both volume and reach for individual frames or indeed individual 'spots' on a digital screen.

2.1.6. Data Delivery (delivery system, data reporting and delivery/ publishing).

In order to promote the use of OOH media, audience data should be made available to the wider advertising community, in addition to OOH practitioners. Data produced for OOH audience research is by its nature complex, to accommodate flexibility in the queries made by end users.

Therefore the application of a further algorithm or calculation based on the user's request is normally hosted within a software application.

The audience measurement body may produce or commission this software to be used across the market, and/or may make the data and required calculation available for 3rd party software developers to compete commercially, based on their processing capabilities or user interface. A competitive marketplace in delivery software may make the data more readily available and accessed by a wider variety of end users with different requirements and use cases.

Where 3rd party software is in use, it is important to verify that the outputs from all applications are comparable, this will require the publication of test figures and a testing regime to authorise the 3rd party software application. This process will need to be repeated for every update to the published data. Maintaining ownership over the user interface for accessing the published data is often seen as an attractive way to control the consistency of outputs achieved by all users.

In order to include newly built or converted frames into the measurement data, and to update counts and travel patterns, a data publishing schedule should be agreed at a frequency that is both affordable and timely.

Where the sample and processing allow, reporting against a wide range of audience profiles increases the usability of the data and increases the value of the outputs where they can match many separate advertisers' targeting requirements. Accommodation should be made to allow end users to understand the credibility of the output data where audience profiling has created a sample that is no longer robust – disclosing the confidence interval surrounding the audience estimates.

At a minimum, the data should be able to report against a range of trading audiences, ideally taking into consideration audiences used in other media, to allow for cross media comparison, and to allow comparability across international markets.

Reporting should be clear as to whether VAC or OTC metrics are being delivered and be available against Impacts (VAC) or Viewable Impressions (OTC/ROTS), and Reach, Frequency, Gross Rating Points at both a national and standard region/market level. The use of several terms varies by market and are often influenced by their application in other media measurement – an expansion on the terms 'contact', 'impression' and 'impact' is dealt with in the Measurement Definitions section of these guidelines.

2.2 Enhanced measurement requirements:–

2.2.1. DOOH – understanding the delivery of fractional space. Developed from research or theoretically modelled.

DOOH is an increasingly important part of the OOH landscape, so a thorough and transparent approach to understanding the delivery of DOOH has become critical for any OOH audience measurement approach.

There are three main areas for consideration in approaching the measurement of DOOH

a The added attraction of DOOH screens to the passer by. Digital screens may have an increased visibility due to their illumination levels, due to the transition from one image to another or due to the ability to have moving images on the screen. This additional visual attraction can be measured through scientific research and several techniques have already been deployed to measure this uplift in screen visibility, creating an attraction factor that is applied to adjust base VAC for DOOH screens.

b The ability to see more than one advertising message. The overall delivery of a digital screen is likely to be higher that a static one as the audience may be able to view more than one message as they pass the screen. Understanding the audience duration in front of a screen, and the advert duration, is critical in being able to calculate the increased overall OTS that the screen delivers. Each exposure may then be visibility adjusted to understand the total delivery of impacts from that screen – and those impacts would then be 'shared' amongst the advertisers on that screen.

c The ability to use the screen for short periods of time makes it increasingly important to understand the audience delivery in far more temporal granularity than that of a static OOH face. Where a screen can be traded by the hour, or even by a spot length, applying an average delivery from the day or week will undervalue the screen in some hours and under deliver for the advertiser in others. Temporal granularity needs to be captured in audience volume counts wherever possible and are likely to need to be modelled to accommodate all DOOH screens being measured.

Addressing these three areas are critical in understanding the increased value that DOOH screens provide in terms of audience delivery. Without a transparent approach to DOOH measurement there is a high likelihood of advertisers "netting down" delivery of screens in an overly simplistic manner, without consideration of their ability to attract and deliver higher audiences than static frames.

Visual attractiveness.

Understanding the increased visibility or attractiveness of a screen can only be addressed through new visibility research, giving subjects appropriate prompt material to simulate the passage past a digital screen from different modes of transport and recording the attractiveness of a screen in direct comparison with a static frame, especially at the point of transition from one

image to another, or where moving images are deployed.

With modern eye camera techniques, it is possible to measure fixations on a frame, static or digital, in real world journeys – however it is difficult to control the multitude of variables that occur in the real world, such as weather, ambient lighting, temporary obstruction by vehicles or people, the behaviour of other road users and other distractions that may not be representative in an 'average' journey. This can be addressed through increased sample size, by capturing extremely large numbers of passages and statistically removing outliers to find a visibility norm for each of the scenarios to be measured – however the sampling cost and processing required is likely to be prohibitive.

Alternatively a laboratory based approach can be used where the prompt material is pre-recorded or virtually created. By using controlled prompt material, different subjects can be exposed to identical passages past a frame where the attributes of the frame have been changed to reflect the aspect being tested. In this case specifically to understand the effect of illumination and movement in the frame, but the technique is equally valid to measure any other attributes that effect visibility, such as size, offset, audience speed, viewable distance etc.

- Pre-recorded material offers the conceptual advantage of a "true" rendering of the real world, but must be carefully selected to represent 'average' distractions and should include comparable versions to accommodate ambient lighting, audience speed, and different frame attributes. The content of the frame, movement or transition within the frame, and frame illumination can all be edited into the stock footage to test those variables.
- Virtual environments cannot render a precise copy of real world video but can offer a close likeness and may also be used to create many model scenarios, however the real advantage of virtual prompt material is that the prompt material is fully controlled, allowing for both frame content and frame attributes to be changed within the same street scene and therefore more flexibility in testing the effect of individual or combined parameters.

Recent studies on the factors affecting the visibility of DOOH have been conducted by individual JICs such as Route in the UK, using video prompt material, and also by an international consortium together with the World Out of Home Organization (WOO), using virtual prompt material. AM4DOOH is a research project carried out by APG|SGA, Clear Channel Outdoor, Exterion Media and JCDecaux, sponsored by WOO . This project used virtual worlds to expose consumers to different forms of digital and traditional outdoor advertising, in combination with eye-tracking methodology.

This latter study, for example, evidenced significant uplift factors for DOOH showing increases in the likelihood of viewing relative to non-digital OOH formats. Digital full motion spots for frontal motorist and pedestrian contacts were seen to be 1.25 and 1.16 higher respectively for each spot in a loop that can be physically seen during a passage. A white paper outlining the AM4DOOH research techniques and results has been published is detailed

in the links section of this paper and is available via the WOO members database.

Multiple contacts.

The potential possibility to view more than one advert in a single passage past a screen can be represented mathematically without the need for a full understanding of the visual attraction of DOOH screens, or the increase in visibility delivered by movement or transition. The approach is a relatively simple calculation based on the duration of the audience contact with the frame and the spot length of the adverts played on that frame, delivering a theoretical increase in OTC, each spot with its own new duration of contact. Existing visibility adjustment can then be applied to each of these contacts to understand the total VAC or impacts delivered by the frame which are then apportioned between the advertisers using the frame.

In the approach above many new OTCs will be created, some with very short contact durations, and will therefore have limited opportunity to be measured as a VAC when existing visibility research approaches are applied. Understanding the increase in attractiveness of DOOH frames and the transition of image within a frame is vitally important in fully realising the value of these short duration contacts, and it is recommended that visibility research is updated specifically for the measurement of DOOH.

Increasing temporal granularity.

The ability to use DOOH for fractional time periods allows advertisers to minimise wastage through temporal targeting and for media owners to maximise yield by delivering audience in the most efficient manner to their clients. This approach to inventory management may be automated through media owner's own inventory management systems, through external valuation approaches such as programmatic trading, or through a combination of both. All approaches require an understanding of the relative value of a DOOH screen across both hours and days.

It is possible to use the existing techniques to model sampled data across multiple frames (as outlined in section 5) and to further model across all likely time periods for all screens, however this approach does require a significant initial sample to maintain credibility.

Fundamentally additional count data, over time, will be required to both inform and validate the modelling approach. That data may be gathered with the use of additional count locations or may be inferred using 3rd party data sets such as transit gate data, HERE, Wi-Fi, SDK or Telco data. Data that is not gathered through a balanced research approach will need further validation and to be moderated to reduce the influence of sample bias and any bias in the method of collection. However, the availability of 3rd party data can be an excellent opportunity to add temporal granularity to an existing audience model.

With the increased need for granularity to measure DOOH there is an increased need for scrutiny of all the input data to the model. In addition to a better understanding of available audience and attractiveness, consideration must be given to the calculation of ROTS. Where multiple images may be seen in a single passage past an DOOH frame, defining both the contact zone accurately and duration of passage becomes even more critical, as these have a significant effect when considering multiple impacts. This is particularly the case where frames have a high proportion of pedestrian audience and where contact durations can be quite long – further scrutiny of models for interior environments including audience routing and visibility obstructions, should be considered.

As with all approaches to granularity, it is important to understand, and be transparent about, confidence intervals to ensure that data published as currency is trusted and robust. This may reduce the granularity offered in the data or may require longer sampling periods to identify behavioural patterns, ensuring that published data is both sensible and defensible.

With DOOH media being traded increasingly through automated or programmatic platforms it is important to treat these platforms as 3rd party users of the data and offer guidance to ensure that metrics supplied by these platforms are consistent with the published data. This becomes increasingly important as Sales Side Platforms (SSP) are required to apply an Impression Multiplier to DOOH opportunities - a single ad purchased in an online environment will be served to a single device, and potentially reach a single member of the audience, whereas a single ad served on an DOOH frame is likely to reach multiple members of the audience simultaneously and this needs to be reflected in the data provided by SSPs to advertisers.

To maintain credibility as a currency it is important that both the buyer's Demand Side Platform (DSP) and the sellers SSP are using the same metrics, and where those metrics are adapted that the method of adaptation is both agreed and transparent to all parties. Where DOOH metrics are provided at a level of granularity that can be used directly in automation – single frame, single hour, single spot – there should be no disagreement in the audience delivery. However where that granularity is unavailable in the currency it should be considered whether to offer guidance on what approach should be adopted by the market.

This may be successfully agreed locally in conjunction with other OOH industry bodies to ensure standardisation, also where active in the DOOH market, the IAB may be a useful partner in agreeing a common approach to producing Impression Multipliers for use in the automated trading of DOOH. Consideration should also be given in the usage licencing of published data, either to include subscribers and users from automation platforms, or to preclude usage of the data that does not conform with agreed protocols.

2.2.2. Adopting Contemporising to OOH audience delivery data.

There is an increasing need for a deeper understanding local and contemporary changes in audience volumes caused by attractor events, seasonality or government restrictions – especially relevant with recent covid restrictions on population movement. Bringing recent 'reporting' data into existing models allows for increased advertiser confidence in the data, and for the market to trade on performance or delivery.

OOH audience measurement to date has largely relied on the regular and repetitive nature of human movement – commuting to a single place of work, working from an understandable range of locations, shopping or socialising in a limited range of locations, with the occasional 'extreme' journey for holiday, or an unusual visit. Understanding these journey patterns has allowed measurement models to use extensive historical journey patterns as an accurate predictor or future movement behaviour.

However, recent enforced changes in regular behaviour, through restrictions in movement, in an attempt to reduce the spread of Covid-19 have shown the current approaches to be less accurate in understanding audience volumes. Changes in working behaviour may, to some extent, become permanent and historical journey studies may not fully represent new behaviour until some time has passed. This has prompted questions from advertiser and agency buyers on the accuracy of our traditional techniques in predicting current behaviour.

Furthermore, as the trading of DOOH increasingly uses on-line trading techniques the demand from advertisers for a more contemporary understanding in audience delivery, grows. Measurement of historical patterns will not reflect local changes in audience and are unlikely to be accurate predictors of audience targeted tactically using DOOH – contemporising data moves the granular trading of DOOH from predicted audiences to measured audiences.

Additionally, accurate estimates of actual audience delivery feeds directly into more accurate attribution modelling. Demonstrating the ROI of OOH media relies on the accurate measurement of the effect of media bought against the actual delivery of the media campaign – contemporised OOH audience data allows that ROI to be more readily calculated.

However, the need for contemporising audience delivery, does not negate the value of understanding audience journey patterns and journey types through a comprehensive travel survey. The frequency of a journey type may change for some audience segments but without a change in road and transit infrastructure, the route taken to perform that journey is likely to remain constant.

The capability to understand every journey precisely for every audience member in near real time would require granularity in input data that is not available through any technique, would require immense computational power, is likely to risk infringement of privacy regulation and bring significant associated costs. So, contemporising audience delivery may be more

reasonably approached as 'moderating' existing tested, and trusted audience measurement models.

Moderating existing models should focus on two key areas

a Audience volumes – capturing contemporary audience counts from a variety of sources against a count baseline that is represented elsewhere in the model. Few count data sources represent actual rather than relative counts, so it is important to use data that is available both currently and for the period that the core audience measurement model represents. Contemporary relative counts can then be used to moderate audience volume through modelling counts across all OOH frames measured. Here the number, reliability and geographical dispersion of counts becomes critical in accurately modelling volumes for other areas. Commonly used data sources are outlined in the table below with their available volume and geographical granularity – it is important to apply contemporising factors at a geographical and temporal level that can be credibly supported by the available data.

b Audience journeys – capturing contemporary audience journeys and journey frequency is a more difficult task but is important in understanding contemporary reach. Applying reduced volumes to an OOH frame evenly may disproportionately reduce the audience reach of that frame, as the change in volume may well reflect a change in frequency of journey rather than the cessation of that journey type. Here it becomes critical in understanding what journey types are being taken by which audience groups - an office worker may reduce their frequency of travel to a fixed place of work, whilst a retail worker or tradesperson is unlikely to be able to make such a lifestyle choice. Capturing contemporary origin to destination data in a geographically and temporally granular manner, against baseline data that is representative of the core measurement model, then allows the modelling of changes in journey types by different audience groups.

Ideally data for contemporising OOH metrics would be gained from comprehensive longitudinal survey using a statistically significant sample for the complete territory, however this is likely to be extremely cost prohibitive.

As the cost of research based sampling prohibits its use at the scale required for both detailed and contemporary temporal analysis - blending geographically detailed data with temporally detailed data should be considered. For example: accurately observing travel habits over an extended period of time may be required to understand geographical movements by mode of transport across every street or link; whilst more contemporary but less geographically accurate data may be readily available to understand changes in both the volume of audience available and their overall origin and destination.

2.2.3. Cross media measurement – developed to fuse with other media measurement approaches or developing new approaches that capture cross media consumption from a single panel.

In recent years there has been increased focus by advertisers on transparency in intra-media comparison. This focus has been stimulated by the difficulty advertisers have experienced in assessing the type of measurement being used in the different media, with often very different measures using similar terminology, and a subsequent lack of trust in inputs critical to assessing the effectiveness of their advertising investment. These concerns have culminated in the WFA global Project Origin initiative, currently active in a number of significant markets around the world, that seeks to increase transparency in measurement and terminology, and ultimately to facilitate meaningful cross media measurement.

In addition, there has been a recent greater focus in our industry on "attention" metrics, where clients of a medium seek a more balanced comparable metric between media than merely different types of viewability. It is fair to say that OOH has historically been at the forefront of this thinking, having been measured for many years in most major markets based upon an attention metric (VAC), viewed impressions as opposed to the more generalised measure of viewable impressions. As advertisers and their agencies appear to be moving in this direction for other media, and it is particularly relevant in the measurement of digital ads, OOH should continue to engage in this area, and ensure that new measurement systems are designed with these cross-media metrics in mind.

Project Origin, active in the US and in the UK has already led to specific outputs in Sweden where OOH engaged with the process supporting the local advertisers' association and working with major research bodies, Google and the major commercial TV channel. These findings are available through the attached links at the end of the document.

In the Netherlands recently the different research suppliers for several of the main broadcast media have similarly worked together to bring harmonisation of reporting to facilitate clearer cross media comparison.

The discussion of cross media measurement is a whole topic in itself, but it is recommended that measurement organisations should where possible seek to develop OOH metrics and approaches that are comparable with other media measurement to facilitate the integration of OOH data with data on other media. Where possible, consumption of other media should be captured at a broad level in any research or survey of respondents to allow for third party fusions with other audience metrics. Measurement and reporting of demographic and geographic characteristics should be comparable to those available for other media in that territory.

	Representation	Locational accuracy	Data frequency	Affordability
Bespoke Tracking device	Based on selected sample	Accurate, interior and exterior	Every second	Low Volume
App Based tracking device	Based on selected sample	Accurate exterior	Every 10-20 seconds	Low Volume
Anonymised Mobile Locational Date/SDK	Representative sample selected from overall data available	Accurate exterior	Multiple times daily	Significant Volume
Mast based telco locational data	Volume of users deemed to be representative at macro demography	Approximate exterior	When connected to the network	High Volume

2.3. Data Input Quality - Completeness and TransparencyRequirements.

To maintain trust in data used in currency, all data inputs should be published and open to scrutiny to stakeholders and users. The technical committee representing stakeholders and users should be allowed to request independent verification of the data input/collection, modelling and the processing used in producing OOH audience measurement data.

Where data is captured for the sole purpose of creating OOH audience measurement the methods should be scientific, balanced against the population being measured and transparent to users.

Where external data is used, the method of capture and any moderation or modelling by the 3rd party provider should be transparent to a technical committee representing the stakeholders and users – under non-disclosure agreement if required.

External data sets must also be validated by a technical committee for completeness, sample bias, bias from the method of capture, and be checked for completeness with QC approaches to identify and remediate incomplete data. For example ticket gate-line data may be seen as a highly accurate measure of passengers entering a transit station, however faults in recording or alternative entrances being opened will cause unusual fluctuations in those data. Telco data may be seen as complete for all transitions between cell boundaries, but can be under representative if a cell tower becomes inoperative for a period of time. SDK data may have identifiable sample bias that can be readily moderated but a change in permissions from a phone hardware provider may influence the number of events recorded by users. It is important to fully understand the foundations and infrastructure required for the capture of 3rd party data sets, in order to design QC procedure that identify and remove unintended variability in these input data, before it is used in the model.

Rigorous quality control (QC) procedures must be deployed for every element of data capture, data modelling and data publishing. Separate codes of

conduct are published both nationally and internationally such as the ICC/ESOMAR Code of Conduct – which should be referred to for additional guidance.

2.4. Frequency of Measurement/Publication.

Data should be published frequently to accommodate changes in audience volumes, audience journeys, urban infrastructure and OOH inventory – however the availability of input data, specifically count data, and the cost of processing may make frequent publication both undesirable and potentially introduce inaccuracy through relying on smaller input datasets.

Consideration should be given particularly to updating OOH inventory data regularly to deliver value to stakeholders in the data outputs – essentially being able to add or change inventory characteristics to an existing journey model. This may involve a more complex and comprehensive audience flow model or may require significant reprocessing of the complete model to accommodate new inventory. Understanding the cadence required by the market will help in the initial model design to avoid repeat processing of a model that may have initially been designed for less frequent releases.

Contemporising of an existing model as described previously may be a more time and cost-efficient approach to updating audience volumes from a researched base line than attempting to frequently update a complete travel survey.

3.1. Market Analysis - Australia, *MOVE*

Summary.

Launched in 2010, Measurement of Outdoor Visibility and Exposure (MOVE) is Australia's premier quantitative audience measurement currency for Out of Home (OOH) advertising, covering major OOH environments including roadside, airports, railway/bus stations, public transport vehicles (including buses, trains, trams, ferries and light rail), shopping centres and petrol stations.

Data is calculated at a sign (frame) level and available for any selection of signs (frames) for multiples of a week of exposure. (MOVE 2.0 to deliver against single frames at the single hour level)

1. Population/volume/OTS – The approach to measuring overall volumes of available audience.

OTS is calculated using the Zenith model from Veitch Lister Consulting (VLC).

The Zenith model is the most widely used travel modelling system in Australia. Developed by VLC and first launched in 1988, it now represents all major metropolitan regions in Australia.

Zenith is a comprehensive and constantly expanding travel demand model. Its distinguishing feature is its ability to accurately simulate public transport systems and services, as well as the characteristics and performance of the road system.

The models include:

- a disaggregate zoning system
- eight home-based trip purposes
- six non-home-based trip purposes
- the incorporation of each route variant and stop for all public transport modes

1.1. External counts used in calculating audience volumes.

- State govt traffic counts
- Ticketing and gate line data
- Transit boarding and Alighting counts
- Shopping centre counts from The Property Council
- Airport passenger counts

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

Visibility Adjustment is made against Opportunity to see as defined by ROTS/OTC as applied in the Cuende zone of visibility. Adjustments are made using the Simon Cooper model based on environment, frame attributes, mode of transport

2.1. What constitutes a contact/impact/delivered impression.

Visually Adjusted Contact (VAC) based on Likelihood to See (LTS)

MOVE 1.5 include a Neural Impact Factor based on studies into memorability through memory encoding – delivering LTS x NIF for every sign (frame)

3. Use of a Travel survey to understand the journeys people make outside their homes.

State Government Household Travels Surveys (single day travel of total household) – 68,000+ households and 600,000+ trips

- 9 day On-line recall survey – 3,000 respondents
- Airport on-line diary – 5,000 respondents
- Mall Face-to-Face exit behavioural survey – 6,000 respondents

3.1. Approach to calculating reach/travel patterns.

Reach and frequency is calculated at a daily level and reported at a weekly level.

The first days reach and frequency comes from the Zenith model based on State Govt. travel data using Origin-destination by zone. Variation of time comes within the algorithms to represent changes over time from the MOVE travel survey. Trip type and modality determined probabilistically by demography, geography (origin and destination), transport availability (i.e. cars per household and proximity and frequency of public transport options) with totals controlled to behaviour seen in Government household travel surveys. The algorithm over time (from the first day R&F) determines the probability of when the same trip will be made again (e.g. a work trip, shopping trip, social/recreation etc), and if the trip is repeated whether the destination the same or different and does the mode change.

Routing is split between shortest path (distance and time) via intermediate nodes based on trip type, quickest path (time) and whether the trip has more than one leg (i.e. serve passenger e.g. drop children at school and then commute to work).

Overall volumes are calibrated against external counts with a tolerance of 10% at point level on major infrastructure (e.g. Motorway) and 3% at campaign level.

4. Inventory Characteristics – how measured and stored.

MOVE hosts and audits inventory details supplied by individual media owners in the MOVE AMS. Audience delivery is available only on frames audited and approved by MOVE. Frame characteristics including ad-play and ad-transition are captured alongside accurate location details against a common map.

5. The method or approach to process these data into usable information.

6. Data Delivery (delivery system, data reporting and delivery publishing)

MOVE data is available solely though the MOVE Audience Measurement System (AMS).

Current licensing allows sellers and buyers access to the audience data.

Sellers only access their own data, down to individual sign level

Buyers only access the total campaign result for package/proposal of signs shared by the Seller

(MOVE 2.0 will enable access to data via API for sellers, access by buyers to be agreed)

6.1. Delivery software to end users, and users access to these data

MOVE supplies proprietary software to access MOVE data - Audience Measurement System (AMS) Only outdoor media companies who are members of the Outdoor Media Association (OMA) are eligible to participate in MOVE. Other users such as media agencies require an authorisation under Access Agreements with MOVE. One Access Agreement will cover all users within a given media agency or organisation.

Members may view individual sign (frame) details, users may access weekly campaign data.

Additional areas of detail

i. Scope of measurement – environments/formats covered

- Roadside – large format, small format , kiosk
- Rail and Light Rail – station, carriage exterior and interior
- Bus and Tram – interior, exterior
- Airport
- Ferry – interior
- Shopping Centre
- Petro/convenience – exterior

(MOVE 2.0 to include – Gym, Café, University, Doctors surgeries, Pharmacy, Pubs/Bars)

ii. Volume of frames/locations

~70,000 (Move 2.0 – 100,000)

iii. Measurement of seasonality/variability across the year

Not currently offered in MOVE or 1.5. To be delivered as hourly data over 365 days in MOVE 2.0

iv. Approach to measuring DOOH and the granularity that this data is available to your users

MOVE 1.5 applies average hourly VAC to DOOH signs (frames). Dwell time is calculated using average visibility distances and average approach speed where available, or applies behaviourally determined dwell time for interior environments. Known spot lengths are applied to determine overall DOOH frame delivery to be apportioned across spots played on the frame.

v. The use of contemporary data

MOVE 2.0 to adopt contemporising based on Telco Origin to Destination data at SA2 level

SA2 is a standard geographical area defined by the Australian Bureau of Statistics and their purpose is to represent a community that interacts together socially and economically. The population size is an average of approximately 1,100 people.

vi. Data release schedule

Monthly for updated and new OOH inventory. Annually for travel survey and R&F model

(MOVE 2.0 will update parts of the models more frequently to cover transport changes i.e. new major roads when they open rather than annually)

vii. The management of data privacy, and Personally Indefinable Information (PII).

MOVE 1.0 – Uses no personally identifiable information in its current audience approach

MOVE 2.0 – Based on a Synthetic audience dataset with imputed attributes

viii. The security, and sustainability of data supply.

Survey data is 1st party, and external count data is publicly available.

MOVE 2.0 is not reliant on a single 3rd parties data, system designed to ingest relevant data from any source. Annual reviews proposed to determine best sources.

ix. Trading metrics offered in market.

Impacts, Reach, Frequency and Neuroscience based impact scores for formats

x. Governance or management structure

MOVE operates under the guidance of a Board of Directors, who set the agenda and provide direction throughout the year. Priorities are determined based on their assessment of the market in the best interest of the industry as a whole. The Board represents shareholders, and members.

MOVE research and data is managed by an independently Chaired technical committee that represents: Stakeholders; Media Agencies (MFA); Independent agencies (IMAA), Advertisers (AANA)

MOVE operates an independently Chaired User Advisory Group, open to all interested parties to better understand the developments in MOVE (1.5 & 2.0) and to feedback end user requirements for the data and interface

xi. Funding structure

MOVE is fully funded by its members. Data is delivered free to approved agencies and advertisers

(MOVE 2.0 is fully funded by its members however agency access to more granular data, yet to be determined, would likely be at a cost to agencies in line with their access to granular data for other media e.g. Television audience data)

xii. Data/research/platform partners

MOVE 1.0 – Veitch Lister Consulting (VLC), Cuende (roadside zone of visibility area), Route & Simon Cooper (visibility data)

MOVE 2.0 – Ipsos, MGE, VLC

xiii. Approach to Cross Media Measurement

Not currently available, under investigation with the development of MOVE 2.0

3.2. Market Analysis - Belgium, *CIM*

Summary

The CIM Out-Of-Home Audience Study that provides the market with all necessary information for the analysis of OOH audiences and media-planning against an average week of travel behaviour:

a Gross contacts per frame and per networks, and by target audience.

b Reach, frequency (avg. OTS and contact distribution) at network level and by target audiences.

c Net reach and reach accumulation per day over a week or the publication period (2 to 4 weeks).

d Cross network & cross universe analysis (total reach, exclusive reach, and duplication).

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

All vectors corresponding to the one-week travels of the 9.614.003 VPD individuals have been mapped.

This makes it is possible to know, for each road and segment:

- How many journeys are registered on an average week or day
- How many travellers
- Time of day
- Sense of the flow
- Travelling speed
- Means of transportation (car, public transport, motorcycle, bike, pedestrian)
- Motive to travel (work, school, shopping, social events, ...)

The vectors and their characteristics have been integrated into an OSM (Open Street Map) cartography.

1.1. External counts used in calculating audience volumes

- Fleet management data acquired through geolocation (Floating Car Data)
- Traffic measurements (loop detectors)
- Public transports statistics
- Published rail timetables

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

Once the inventory is in place, all potential contacts can be calculated :

- the sum of all passers-by
- who can see a panel from neighbouring road segments

These passers-by represent the ROTS, i.e. all people with a Realistic Opportunity To See

The international ROUTE visibility algorithm (originating in the UK) is then used to calculate the % of people really viewing the panel.

The Visibility Adjustment Index is calculated for each individual panel, based on size, distance and cone of visibility, height, angle of vision, distance off-axis, illumination, movement,...

2.2.What constitutes a contact/impact/delivered impression

Visually Adjusted Contact (VAC) = eyes on an ad - You have a contact when somebody has looked at the ad.

3. Use of a Travel survey to understand the journeys people make outside their homes

Travel diaries used to create a virtual population of Belgians 12+ and their travels habits

The previous CIM OOH survey

Public mobility surveys (Belgian Daily Mobility, Onderzoek Verplaatsingsgedrag Vlaanderen)

- 3 Donor surveys were merged into 1 coherent dataset (UD, or Unified Database)
- Their demographic and travel characteristics were standardized, modelled, calibrated
- and validated with benchmark data (census data and traffic data)
- The UD is a representative sample (~45.000) of Belgians with their :Demographics : gender, age, living place, education, occupation,...

Travel data over 7 days : day, hour, travel means (car, bus,...) and motive (work, school,...).

3.2.Approach to calculating reach/travel patterns

Sociodemographic characteristics of the Unified Database are ascribed to 9.614.003 Belgians aged 12 years and over, in a new dataset called Virtual Population Database (VPD). Then, the travelling habits of the UD members have been modelled and ascribed to the 9,614,003 VPD individuals

- Clustering of statistical sectors (neighbourhoods)
- Ascription of living place to each individual in accordance with their relevant socio-demographics
- Activity Based Modelling: linking demographics & mobility patterns using Telco data
- Attribute mobility patterns to each individual (number of trips, motive, transportation mode, start/end point,...)

Travelling habits ascribed to the VPD individuals have been validated with passive data (loops,...) and calibrated with benchmark data (floating car data, traffic counts,...).

Proximus TelCo data are used for mapping Origin-Destination relationships:

- 1 Billion mobile localizations/day can be translated into routes
- 40% market share in Belgium is sufficient to build a representation of travel behaviour

Be-Mobile model the data delivered

- 3 months observations
- Weighted and extrapolated to the Belgian population
- Aggregated at postcode level, per day (7) x daypart (4), for an average week, refined to exact address
- Creating an OD matrix at statistical sector level, used as input for the new Activity Based Model

Creation of indoor environments through the digitization of detailed maps of stations with the exact position of their entries/exits, allowing to connect the stations entries/exits (access points) to the Open Street Map (roadside environment)

Including all interior characteristics (walls, gates, platforms, stairways/ escalators, obstructions)

Simulation of traffic flows inside stations, based on indoor methodology from Route UK:

- Flow modelling, calculating all possible routes from entries to exits, entries to platforms and platforms to platforms and assigning to each route a probability based on shortest route length
- Platform modelling, distributing traffic on platforms according to platform length and distance to train doors

4. Inventory Characteristics – how measured and stored.

Some 45.000 panels have been geolocated and characterized in the Inventory Management

Software (IMS) of MGE Data

Each panel is characterized by :

- Latitude & longitude
- Address
- Size
- Position vs road
- Cone of visibility (distance, obstacles)
- Illumination/not lit
- Dynamic/static
- Ownership data & accompanying photographs

The panels and their characteristics have also been integrated into the OSM cartography

5. The method or approach to process these data into usable information

There is a series of calibrations of the model. Street segments are compared with measured data. If the audiences where too low on certain streets, the model was adjusted so it could get more traffic. If the model showed too high traffic, compared to measured data, the street segment got a negative parameter to decrease the traffic on that segment. At the end, all segments where approx. in line with measured data.

6. Data Delivery (delivery system, data reporting and delivery Publishing)

See 6.1.

6.1. Delivery software to end users, and users access to these data

The CIM OOH Audience data are made available through reporting & evaluation web tools

Additional areas of detail

i. Scope of measurement – environments/formats covered

Roadside, Metro and Train stations

ii. Volume of frames/locations

45,000 Roadside frames - 98% paper frames and 2% digital screens

iii. Measurement of seasonality/variability across the year

We use a seasonality index on a national level. Each week of the year has a specific index.

(In practice there are 6 different indexes depending on the week) because differences in normal weeks were to small and not significant.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

The vendors have the audiences for each screen, per day, per hour. These are injected in the SSP's (Broadsign, ViOOH, ...) and are thus available for the buyers with a DSP.

v. The use of contemporary data.

CIM is currently tendering to identify methods and data that allow to measure traffic volumes at a sufficiently granular level to generate traffic evolution indexes.

CIM wants to apply these traffic indexes on its current survey results (used as the average reference), in order to differentiate performances over time

vi. Data release schedule.

Travel behaviours and maps are updated every 3 years. We hope to do this more frequently using other agile methods to measure traffic evolutions (see above). The panels are updated at least 2 times a year.

vii. The management of data privacy, and Personally Indefinable Information (PII).

The CIM Out-Of-Home Audience Study and our research partners are fully GDPR compliant.

viii. The security, and sustainability of data supply.

Travel survey is 1st party data, external counts are publicly available data produced by local and national authorities, Proximus TelCo data represent 40% of users in Belgium

ix. Trading metrics offered in market.

Gender, Age, Nielsen group, Education, Professional, Location,

- Gross contacts per frame and per networks, and by target audience.
- Reach, Frequency (avg. OTS and contact distribution) at network level and by target audiences.
- Net reach and reach accumulation per day over a week or the publication period (2 to 4 weeks).
- Cross network & cross universe analysis (total reach, exclusive reach, and duplication).

x. Governance or management structure

The CIM is the multimedia Joint Industry Committee responsible for all media audience currency studies in Belgium.

xi. Funding structure

The survey is funded by the vendors (90%) and the other 10% by media agencies and advertisers.

xii. Data/research/platform partners

BEMOBILE - Traffic modelling and calibration.

Proximus TelCo - mapping Origin-Destination relationships.

MGE - Cartography and visibility adjustment, Inventory management software, Exploitation software.

xiii. Approach to Cross Media Measurement

Not in scope for the moment, everybody wants this but nobody agrees on how, what to measure, fundings.

3.3. Market Analysis - Canada, *COMMB*

Summary

COMMB is the national organization for the Canadian out-of-home industry comprised of advertisers, agencies, programmatic tech stacks and OOH companies. COMMB is responsible for developing and verifying audience measurement methodologies, providing audience data and planning resources, marketing and communications, and member services to the Canadian out-of-home industry. www.commb.ca

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

a Outdoor | Volume: Ingestion of data on over ~6.7 million road segments across the country incorporates multiple sources of data to estimate average annual vehicular and pedestrian volumes by average day, day type (Monday, Tues. etc.) and by hour for every directional road segment (as defined by HERE Technologies) in Canada. Volume data is combined with many other factors (as indicated below) to calculate an average daily circulation for either a static or digital face as well as screen impression and/or ad-play (spot) level impressions for DOOH. These final 'available audience' numbers are an extrapolation of all items listed below and vary based on the specific outdoor location information such as size, facing direction, spot length for DOOH etc. For DOOH specifically our platform will house 192 hourly impressions for vehicular, 192 hourly impressions for pedestrian and 192 hourly impressions for the combination of veh+ped, taking a programmatic-first approach to ensure digital adoption. This data also exists for static inventory, however in most cases is not accessed based on the use-case of selling traditional media vs. digital/pDOOH.

b Population: Population data is ingested on an annual basis from Manifold Data Mining at the market level.

c Outdoor | OTS: Opportunity to see is assessed at the face level for both static and DOOH. For each fact a maximum distance visibility zone (DVZ) is applied based on the size of the outdoor asset – defined as the furthest point the media format could be clearly visible from. This is then further analysed by evaluating obstructions for both static and DOOH and vehicular flow data for each DOOH face, identifying the percentage of vehicles that may only be exposed to the DOOH face for a portion of the maximum DVZ, for example, a DVZ for a large format digital (series 14) may be to a max. of 1500ft., however there are two intersections that and an obstructing building which fall within that 1500ft. range. We assess what % of vehicles turn at both intersections and only apply the volume of those vehicles traveling within the DVZ that have an appropriate OTS, as well an road segments which have obstructions such as buildings or permanent fixtures would also be removed from the volume count.

d Place-Based – The current approach of place-based networks reports an average weekly circulation by venue and incorporates a range of manual counts during set times (regression analysis based), transactional data, survey data and any available relevant studies to determine weekly impressions. In late 2022 this approach will be revised to also include mobile location data and the ability to extrapolate average daily circulation as well as daily and hourly impressions at the screen and ad-play/spot level.

1.1. External counts used in calculating audience volumes

Outdoor vehicular and pedestrian volumes source local, regional and federal government transportation authorities, mobile location 'trips' data identifying origin and destination as well as travel studies, plans, surveys or any other applicable data.

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

Please see section 1.0 c

2.3. What constitutes a contact/impact/delivered impression

Impressions are based on the Opportunity-To-See criteria and assessed at a 192 hourly day-part per week for vehicular, pedestrian and a combination of veh+ped. Data. Impressions vary based on the media owner spot length and a delivered impression is that which meets the criteria of the OTS which falls within the distance visibility zone (DVZ).

3. Use of a Travel survey to understand the journeys people make outside their homes

Vehicular volume: See 1.1 for use of travel survey's for volume data

Reach/Frequency & Audience Profiles: Mobile SDK-only data (COMMB does not partner with any spatial data providers who uses or combining Bid Stream data with SDK data due stringent privacy regulations within the Canadian market) enables precision in determining the 'trips'. These trips understand the origin and destination of devices passing directionally by outdoor locations and entering place-based venues and correlate those to a 'home' location – defined as a devices persistently static location during sleeping hours. The long/lat is then reverse geocoded to a full 6 digit postal code and paired with Statistics Can and other survey based demographic, lifestyle and behavioural datasets. Characteristics of devices passing inventory may vary from the overall characteristics of the postal code and certain behavioural patterns (e.g. commuting) are also considered.

3.3. Approach to calculating reach/travel patterns

Using empirical time and location device data to determine real-time travel patterns, we apply several statistical models to calculate three key parameters for the R/F analysis; 'the relationship between impressions and unique devices', 'TRPs', 'GRPs' . These parameters are then used to determine reach and are calculated for each individual face or product combinations across all Canadian markets for all OOH companies. (edited)

COMMB provides not only the In-Market% impression necessary to calculate a GRP via an R/F plan however we also report the 'spill' impressions, which represent the total impressions garnered from out-of-market which represents 1%+ of the total audience population.

4. Inventory Characteristics – how measured are stored.

Our web-based platform stores all pertinent details about inventory such as lat/long, facing direction, type and size, illumination hours, etc. The data ingestion and processing is done via Google Cloud Storage, Apache Airflow and SendGrid. The database layer is comprised of SnowflakeDB and PostgresSQL which feeds a services layer of Auth0, NodeJS and Python with a Google API gateway. All data powering circulation and impression outputs are stored in Snowflake DB per the following available outputs:

Inventory Type	Measurement Values	Hourly	Day Type	Day Part	Total
Digital	Vehicular Screen Impressions	192	8	40	240
	Pedestrian Screen Impressions	192	8	40	240
	Total Screen Impressions	192	8	40	240
	% Pedestrians of Total Screen Impressions	*192*	*8*	*40*	*240*
	Total Screen In-Market Impressions	192	8	40	240
	Vehicular Spot Ad Play Impressions	192	8	40	240
	Pedestrian Spot Ad Play Impressions	192	8	40	240
	Total Spot Ad Play Impressions	192	*8*	*40*	240
	% Pedestrians of Spot Ad Play In-Market Impressions	*192*	*8*	*40*	*240*
	Total Spot Ad Play In-Market Impressions	192	8	40	240
	Vehicular Dwell Time	192	8	40	240
	Pedestrian Dwell Time	192	8	40	240
	Consolidated Dwell Time	192	8	40	240
	DIGITAL IMPRESSIONS TOTAL	**2,496**	**104**	**520**	**3,120**

Inventory Type	Measurement Values	Hourly	Day Type	Day Part	Total
Static and Digital	Vehicular Circulation	192	8	40	240
	Pedestrian Circulation	192	8	40	240
	Total Circulation	192	8	40	240
	% Pedestrians of Total Circulation	*192*	*8*	*40*	*240*
	In-Market Circulation	192	8	40	240
	STATIC AND DIGITAL CIRCULATION TOTAL	**960**	**40**	**200**	**1,200**

5. The method or approach to process these data into usable information

Outdoor circulations account for distance visibility zones (DVZ) in assigning vehicular or pedestrian volume sources that have OTS (Opportunity-To-See) inventory. The product type determines the applicable distances. For DOOH specifically, we leverage a higher aptitude of rigor as DVZ to account for the screens offset from a roadway, for example if the standard DVZ criteria for a digital superboard was 1500ft however the actual/optimal visibility zone falls at 900ft, this is the distance which would be leveraged for the in-depth impression calculations. Please see section 1 for further information.

6. Data Delivery (delivery system, data reporting and delivery Publishing)

A member-only web-based platform accessible to all members in various capacities. Access via a web portal or API with authentication is available to all members. For Programmatic/Re-Marketer members, approval to provide data via the COMMB API is required by the media owner member prior to release of any data. As mentioned in section 4, there are over 1,200 available static and digital circulation outputs and over 3,100 available digital impression outputs. The cadence of data refresh depends on the component of the data ranging from annually to quarterly.

6.1. Delivery software to end users, and users access to these data

Data is available via the web portal, direct export from COMMB to member or via API integration. Details of software architecture are listed in Section 4.

Additional areas of detail

i. Scope of measurement – environments/formats covered

Outdoor – Inventory within +300 markets across Canada including the top 45 major markets and many smaller regional or rural markets. Formats for both static and digital inventory include;

- Street Furniture (street level advertisements such as transit shelters)

- Posters (horizontal, vertical or backlit)
- Superboards (large formats such as bulletins, murals, or Series 10, 12, 14s (e.g. 10ft by Xft))
- Bike-Share (communal bike share stations)

Place-Based – 11 networks measured primarily within the top 10 markets across Canada;

- Arena (smaller community ice rinks)
- Campus (colleges & universities)
- Cinema (movie theatres)
- Resto-Bars (restaurants & bars, excluding night clubs)
- Women's (hair & nail salons)
- Liquor Stores (independent liquor retailers)
- Residential Network (indoor residential towers in-elevator, lobby, mail and parking garage areas)
- AudioOOH Networks
  - Grocery
  - Super Stores
  - Discount Stores
  - Pharmacy

ii. Volume of frames/locations

Over ~63,000 units of inventory (combined number of static faces & digital screens);

- ~46,000 Outdoor (~1,700+ digital screens)
- ~17,700 Place-Based (~1,800+ digital screens)

iii. Measurement of seasonality/variability across the year

Outdoor at this time, is sourcing average annual data, however the methodology can accommodate seasonal data if our members choose to move in that direction. The data refresh frequency is currently being reviewed by our Board of Directors.

Place-based networks are currently under review with a recommendation pending in May 2022 to move to weekly data ingestion which can be rolled up into varying frequencies of measurement based on network type. For example, resto-bar would need to account for seasonal fluctuation such as summer patio season, whereas residential networks may not need as frequent of a refresh cadence. These parameters are currently being reviewed by our Research Committee and will be presented for a vote in Q2-2022.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

- Distance Visibility Zones (DVZ) provide the maximum viewing distance of a digital face considering it's size and orientation to the roadway
- Opportunity to See (OTS) criteria such as obstructions in visibility like buildings, permanent fixtures etc., and vehicle flow data to understand the visibility impact of each face at intersections which fall within the DVZ are assessed
- Vehicle and pedestrian speed and vehicular occupancy are accounted for and paired with intersection flow and volume data to understand the viewing audiences' movement with the DVZ and to calculate dwell time
- Spot Exposures account for the maximum number of spots a viewer could see based on the DVZ and dwell time and are calculated by understanding the above data as well as the length of spot/ad-play for each face (provided to COMMB by the OOH companies) and

Place-Based digital screens incorporate the dwell time within the screen placement and adjusts based on our members ad spot details.

v. The use of contemporary data.

Contemporary data such as machine learning is being built into our new COMMB platform launching in 2022. The platform leverages ML and data-science techniques to understand and enhance user experience within the platform as well as to streamline some manual processes for inventory management such as auto-assignment of road segments for new outdoor inventory, which is then followed by a human review for accuracy/tweaking. Contemporary data is also being leveraged within our data visualization process and backend data-lake.

vi. Data release schedule.

Outdoor inventory revisions (additions/deletions/revisions) are managed and provided to our members with new/revised circulations within a few days. The current vehicular and pedestrian volume and speed data is on a 3-year update cycle; however, this is under review with our Board of Directors for a more frequent data refresh (seasonally/annually is being recommended).

Place-based networks are currently under review with a recommendation pending in May 2022 to move to weekly data ingestion which can be rolled up into varying frequencies of measurement based on network type. For example, resto-bar would need to account for seasonal fluctuation such as summer patio season, whereas residential networks may not need as frequent of a refresh cadence. These parameters are currently being reviewed by our Research Committee and will be presented for a vote in Q2-2022.

vii. The management of data privacy, and Personally Indefinable Information (PII).

Canada has new Federal privacy legislation under review in 2022 called Bill

C-11 as well as additional Provincial legislations are also being implemented, such as the recently passed Bill 64 in Québec. COMMB data providers and vendors must comply with all Federal and Provincially mandated privacy legislations, including the ability to 'audit' at any time the use of "expressed consent" for location tracking as well as retargeting. COMMB only leverages data providers who can provide full transparency into data/time stamped 'expressed consent' and will not accept providers leveraging 'implied consent'. Additionally, only AppSDK data is leveraged within our data collection, and we do not accept partners providing location data via AdSDK or blending AppSDK and AdSDK.

viii. The security, and sustainability of data supply.

Our approach to data supply specifically as it pertains to location data, has been a direct-to-publisher approach so as to ensure the sustainability of our product. We do not work with mobile location aggregators within our measurement methodologies, any partner COMMB engages with has a direct to publisher approach. Security wise, all data is stored and housed in Canada following all privacy and data sharing legislative rules and regulations.

ix. Trading metrics offered in market.

General Impressions/reach, CPM, CPA, CPIV, R/F, omni-channel engagement/ conversions/clicks.

x. Governance or management structure

No details being provided at this time

xi. Funding structure

No details being provided at this time

xii. Data/research/platform partners

Bentley - Vehicular and pedestrian volume, speed and occupancy data.

Pelmorex – 1st Party SDK data for R/F & Audience Profiling.

Docma – R/F & audience modeling.

Manifold Data Mining – Demographics and population modeling.

Vividata – Product and consumer behaviours

Tactable – software engineering, architecture, and development of the production & planning system

xiii. Approach to Cross Media Measurement

Yes, we are working with our omni-channel buying members to understand their needs and have adjusted our R/F outputs to align with that in omni-channel measurement. Highlighting not just the in-market % for GRP calculations but incorporating visibility into the 'spill' from the top 5+ markets contributing to the total overall impressions of a face. We also will provide the % of unique vs. repeat impressions which aligns well with native online/search/ social and mobile advertising.

3.4. Market Analysis - Germany, *ma Out of Home*

Summary

Developed by the German professional out-of-home advertising association "Fachverband Aussenwerbung" (FAW) and published annually by the joint industry committee agma, a working group for media analysis, ma Out of Home is Germany's leading out-of-home advertising coverage study for almost all 300,000 analogue and digital out-of-home advertising media. It forms the basis for the targeted planning of both advertising agencies and other advertising entities

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

1.1. External counts used in calculating audience volumes

The traffic volume data set "frequency atlas" produced for the FAW by Fraunhofer Institute for Intelligent Analysis and Information Systems (IAIS), provides data on the frequency of traffic based on numerous counts of the average number of people walking or going by in a vehicle, including users of public transport, along all seven (7) million street segments

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

For each format, there is a defined set of visibility factors. According to the exact positioning of each panel in our data base and exact relation to each street segment, the result is a likelihood to contact the panel for each traffic mode car, public transport or pedestrian..

2.4. What constitutes a contact/impact/delivered impression

A contact is the multiplication of all the passages alongside the panels times their individual visibility adjustment. Additionally, digital spots are weighted by their probability of exposure.

3. Use of a Travel survey to understand the journeys people make outside their homes

A representative survey of the mobility patterns which covers the whole of Germany: 14 day GPS study with a previous day CATI study

Computer-assisted telephone interviews (CATI) conducted with approx. 60,000 people,

the interviewees are asked about the routes they took the day before. The interviewer logs these answers directly into a mapping software.

For 7 to 14 days, all movements of a sample consisting of approx. 12,000 people are registered by GPS.

3.4. Approach to calculating reach/travel patterns

Opportunities to See (= OTS) are identified for each panel, such that the net reach is determined indirectly by combination with gross contacts.

The result of the travel survey is used to count the number of contacts respondents have with a panel during 7 days (= OTS 7). For each site with a sample lower than 100 people, the "missing" people will be substituted by adding passers-by from the immediate surroundings; alternatively, the value is extrapolated on the basis of OTS 1 or of similar panels.

The number of expected net contacts for each panel is then projected onto the overall population of 14+. These individual values can also be combined into booking units (packs or networks), whose overall reach can be calculated based on a binominal distribution model.

4. Inventory Characteristics – how measured and stored.

The FAW database contains the exact position of all OOH advertising media (e.g. panels, billboards, DOOH spots)

5. The method or approach to process these data into usable information

See 2 for the visibility adjustment

6. Data Delivery (delivery system, data reporting and delivery Publishing)

A full data set with all respondents X all ad units is distributed to interested members.

6.1. Delivery software to end users, and users access to these data

The data set is inputted in counting software products (both provided by the FAW itself and independent software bureaux; these offer individual creations of target groups)

Additional areas of detail

i. Scope of measurement – environments/formats covered

- Roadside

- Shopping
- Public transport (stations)

(Ads inside and outside of vehicles of public transport are evaluated in a different study called AdMotion, which is based on the travel survey of the ma Out of Home)

ii. Volume of frames/locations

270,000 OO and DOOH locations

iii. Measurement of seasonality/variability across the year

Seasonality is not currently offered in the output data

iv. Approach to measuring DOOH and the granularity that this data is available to your users

The ma Out of Home is currently expanded by drilling DOOH to specific spot contacts. (impressions per spots = IPS)

The visibility adjustment takes into account the bright illumination and visual attractivity due to movement of images.

The basic traffic volume (see above) and the average speed are weighted according to hourly location-specific traffic-indices (for one average week of the year) based on movement patterns gained from mobile app data.

According to the specifics of possible spots, for each booking unit the spot contacts are calculated taking into account its probability of exposure.

The publication of these digital spot impressions were added to the ma Out of Home in the publication in September 2021.

v. The use of contemporary data.

2.0 – for DOOH – will be released this year in September 2022, adding mobile data and dynamization of reach and impact.

vi. Data release schedule.

At least once a year. Updates in between occur.

vii. The management of data privacy, and Personally Indefinable Information (PII).

ma out of Home is fully GDPR compliant

viii. The security, and sustainability of data supply.

Travel survey is 1st party data, traffic volumes are updated subject to availability.

ix. Trading metrics offered in market.

In terms of pricing indicator, the currency is the number of contacts.

Since we calculate gross contacts and net reach, all the combinations (like

GRP, OTS, CPT) are published through the software products

x. Governance or management structure

Developed by the German professional out-of-home advertising association "Fachverband Aussenwerbung" (FAW)

xi. Funding structure

The vendors pay their share through the number of units (main funding)

Clients only pay a membership fee plus a small license fee for counting software

xii. Data/research/platform partners

Classification of ad units – software of MGe Data/IPSOS

Field work (GPS tracking): agma contracts with (different) institutes every year

Calculation of reach & frequency: ISBA Hamburg

xiii. Approach to Cross Media Measurement

agma publishes a cross media survey every year.

Since the GPS tracking is done within that cross media survey, there is a single source approach.

Additional hooks are integrated in the pure OOH-fieldwork to enrich the sample base with respondents that are fused into the cross media data set.

3.5. Market Analysis - Japan, *LIVE BOARD*

Summary

LIVE BOARD formed on 1st February in 2019 as a JV with NTT DOCOMO (51%), the largest mobile carrier in Japan and Dentsu (49%).

LIVE BOARD is the first 3A-Compliant* digital OOH company and drives "Programmatic OOH" ecosystem. (* Accountable, Addressable, Attributable).

Based on NTT DOCOMO's carrier data collected by following NTT DOCOMO Privacy Policy *, gives impressions for every ad spots. Also, with 100% programmatic native platform, from planning to trading to ad serving, all processes are fully automated and shows concreate business outcomes.

LIVE BOARD offers DSP and SSP services.

Additionally has access to DOCOMO carrier data for attribution.

*: https://www.nttdocomo.co.jp/english/utility/privacy/index.html

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

"Mobile Kukan Tokei™ **" (Mobile Spatial Statistics) data with 125m x 125m mesh based on 83M+ NTT DOCOMO subscribers, statistically refine and allocate the # of audiences into smaller meshes which belong to visible area of a frame, eliminate counts from the audience who pass in underground.

For interior environments AI camera counts are used to determine OTC(ROTS)

**: "Mobile Kukan Toukei" is a trademark of NTT DOCOMO, INC. The services are only available to subscribers in Japan.

1.1. External counts used in calculating audience volumes

Mobile Carrier Data (NTT DOCOMO) and other location Data.

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

The Visibility Area is defined by frame size and height from view with obstructions removing some of the area - visibility research is applied to the count of Opportunities to Contact (OTC) to create a "Visibility Rate".

For interior environments AI camera counts , other transaction or count data are used to determine both OTS.

2.5. What constitutes a contact/impact/delivered impression

A visibility adjusted impression from the count of Opportunities to Contact (OTC) based on research conducted by NTT DOCOMO.

3. Use of a Travel survey to understand the journeys people make outside their homes

Methodology based on telco (NTT DOCOMO) device movements.

3.5. Approach to calculating reach/travel patterns

LIVE BOARD uses NTT DOCOMO's Mobile Kukan Tokei™ (mobile spatial statistics) and subscribers' data to determine unique audience and attribute gender and age. Within the screen visibility zone.

4. Inventory Characteristics – how measured and stored.

As a media owner, LIVE BOARD stores the location including latitude and longitude, size, type, photos are stored in our LIVE BOARD Market Place platform. In addition to that LIVE BOARD disclose the list of the screens with address, size, and method of measurement on our homepage. As LIVE BOARD knows as of the end of 2022 January, there was not external industry database.

5. The method or approach to process these data into usable information

Weighted count OTC from NTT DOCOMO devices with visibility area, apply Visibility research factors and apply demographic attributes from NTT DOCOMO DMP.

6. Data Delivery (delivery system, data reporting and delivery Publishing)

See 6.1.

6.1. Delivery software to end users, and users access to these data

Data delivered within LIVE BOARD Market Place (proprietary) or as data feed from LIVE BOARD SSP to 3rd party DSP.

Additional areas of detail

i. Scope of measurement – environments/formats covered

- 125 Outdoor
- 31 indoor
- 480 owned in train
- 202 station
- 4693 in store

ii. Volume of frames/locations

5,604 DOOH screens/ locations.

iii. Measurement of seasonality/variability across the year –

LIVE BOARD marketplace imports new data monthly.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

LIVEBOARD is a specifically DOOH audience measurement approach. Define several travel models to extrapolate the # of audiences who are located in the visible area during each spot (15"") of ad delivery

v. The use of contemporary data.

COVID-19 also forces advertisers to care about the "actual" or "real-time" data rather than historical data, to prove the real value of the media investments – based on NTT DOCOMO mobile data.

vi. Data release schedule.

Every month for all screens.

vii. The management of data privacy, and Personally Indefinable Information (PII).

Only NTT DOCOMO data gathered under their privacy policy is used.

AI Camera: LIVE BOARD doesn't collect the privacy information. And LIVE BOARD follows the Digital Signage Consortium's Sensing Signage Guideline following Public Purpose Initiatives Utilizing Camera Images by Private Business Operators issued by The Ministry of Internal Affairs and Communications (MIC) and the Ministry of Economy, Trade and Industry (METI).

viii. The security, and sustainability of data supply.

LIVE BOARD is part owned by the key data supplier NTT DOCOMO

ix. Trading metrics offered in market.

At this moment, most of the publishers do not provide the trading metrics such as OTC and the impression in the Japan market.

LIVE BOARD uses only Impression data as trading metric. And some media owners sell the inventory on the LIVE BOARD Market place and on the marketplace the metric is the impression as the trading metric.

x. Governance or management structure

LIVE BOARD is a company formed on 1st February in 2019 as a joint venture with NTT DOCOMO (51%), the largest mobile carrier in Japan and Dentsu (49%)

xi. Funding structure

NTT DOCOMO (51%), Dentsu (49%) with US$45.7M investment (capital reserve: US$2.29M., capital fund: US$2.29M) in total

xii. Data/research/platform partners

Data partner: NTT DOCOMO

AI Camera partner: Fujitsu/ Future Standard

Research partner: DOCOMO Insight Marketing

Platform partner: Hivestack Inc.,

xiii. Approach to Cross Media Measurement

DOCOMO ID, which is unique ID of the NTT DOCOMO, is used for cross media measurement.

3.6. Market Analysis - New Zealand, *Calibre*

Summary

Calibre uses proprietary algorithms and methodology to blend disparate data-sets and produce
Reach & Frequency measures for large format and street furniture sites in New Zealand

Calibre delivers – measurement, planning and behavioural insights

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

Raw counts are modelled to average daily count. Business rules developed by the out of home media industry in New Zealand, extrapolate the traffic counts to produce a count of how many people view a site each day from a vehicle. This Daily Traffic Visual (DTV) metric is used in the Calibre model to ensure the audience at high vehicle volume locations (eg; motorways) is not under-represented.

1.1. External counts used in calculating audience volumes

Aggregated data from sensors deployed by local councils to count cars, leading traffic count estimate model in NZ; RAMM

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

No

2.6. What constitutes a contact/impact/delivered impression

DTV (Daily traffic visual) = Passage through a viewable corridor past a OOH site, Takes into account traffic direction and billboard angle

3. Use of a Travel survey to understand the journeys people make outside their homes

Based on Telco and SDK data

Using inferred home location to determine audience profile/persona

3.6. Approach to calculating reach/travel patterns

The primary source for Reach & Frequency data is currently being transitioned to new inputs and new methodology. This section will be updated accordingly.

Currently, the Reach and Frequency model leverages three key data inputs

- Mobile location data - cell tower 40% of NZ residents
- Mobile location data - app SDK and cleansed bid-stream data
- Traffic counts

Calibre feeds cleaned, balanced & weighted data inputs into a proprietary algorithm, which dynamically ' flows' vehicle and pedestrian audience members along road segments and through viewable corridors past each site. This process delivers unique reach, frequency and contacts f or every site and combination of sites in the system.

4. Inventory Characteristics – how measured and stored.

Each media owner is responsible for supplying their inventory lists to REACH, including all relevant descriptive fields and location coordinates, photos and site cards.

Site data is updated in Calibre quarterly.

An enhancement for Calibre is planned, which will allow media owners to manage and update their site data directly, via an online portal.

There is no external standardised industry database for New Zealand OOH at present.

5. The method or approach to process these data into usable information

The primary source for Reach & Frequency data is currently being transitioned to new inputs and new methodology. This section will be updated accordingly.

6. Data Delivery (delivery system, data reporting and delivery Publishing)

Delivery system

6.1. Delivery software to end users, and users access to these data

Calibre includes a simple, intuitive platform designed for use at outdoor media companies, and by agency media planners.

The platform provides

- Channel planning efficiency
- Audience targeting and optimisation
- Measurement and transparent results
- Accessible reporting

Additional areas of detail

i. Scope of measurement – environments/formats covered

Outdoor and Street furniture

ii. Volume of frames/locations

More than 3,500 locations, across all regions where roadside OOH is offered. Ie: every region of New Zealand is represented in Calibre

iii. Measurement of seasonality/variability across the year

Seasonality at month level is available in the data

iv. Approach to measuring DOOH and the granularity that this data is available to your users

Calibre presents campaign measurement for a weekly audience.

Future enhancements will enable measurement of audience in hourly intervals.

v. The use of contemporary data.

In New Zealand, each individual OOH company uses their own contemporary data sources to modify the results from Calibre, to reflect short-term changes in people mobility.

Calibre remains consistent, as a measure of typical people movement

vi. Data release schedule.

Calibre's audience measurement model, site databases and outputs are updated quarterly.

Short-term, urgent updates of the model, or site changes are also possible on an ad-hoc, as-needs basis.

Planned enhancements for Calibre include supplying more 'real-time' data to supplement larger historical data sets.

vii. The management of data privacy, and Personally Indefinable Information (PII).

Transaction and mobile location datasets in Calibre contain depersonalised, aggregated data.

It is not possible to infer the identity of an individual, or an individuals' address from any field in the database.

It is not possible to reverse engineer or somehow match records in Calibre to identify an individual person

viii. The security, and sustainability of data supply.

ix. Trading metrics offered in market.

Net reach, Average frequency, Gross contacts

x. Governance or management structure

The Calibre application is owned by Calibre Audience Measurement Limited (CAML), an entity established and owned by JCDecaux and oOh! Media for the purpose of driving industry standard audience measurement in New Zealand.

Governance is via monthly Calibre planning meetings, attended by representatives of both ownership stakeholders, and invited parties who are affiliated or have future interest in leveraging the Calibre application.

REACH, an independent media & data company, develop and maintain Calibre on behalf of CAML.

xi. Funding structure

CAML provides funding for the development and maintenance of Calibre, and provides a sub-license to OOH companies, who are not part the CAML group.

Platform costs for queries are paid on a quarterly basis, based on the number of queries consumed.

Data licenses are generally centralized and held by REACH with each data owner - sublicensed for use by Calibre members.

Data license structures vary by data owner; some are based on a monthly subscription, others are annual or one-off fees.

xii. Data/research/platform partners

REACH, a 3rd party data & media company, develop and maintain Calibre on behalf of its owners.

xiii. Approach to Cross Media Measurement

A number of ad-hoc, informal conversations have been held with various media owner and agency groups.

No plans are currently in place for cross media management in the immediate term.

3.7. Market Analysis - South Africa, *ROAD*

Summary

The methodology used in South Africa includes a combination of satellite images, traffic flows and travel patterns to create a comprehensive traffic model, which when combined with the location and panel orientation of all media owner billboard panels, creates a representation of OOH audiences.

These elements are modelled to create OOH ratings demonstrating reach, frequency, GRP's, impacts, and CPM for OOH campaigns or single billboards.

Elements such as direction of traffic flow and visibility zone analysis are considered as part of the model.

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

Size of audience and population is collected through a face-to-face travel survey which provides demographic as well as origin and destination information.

Traffic densities are then calculated by Cuende using satellite imagery from Maxar. This data is used to model probable travel routes based on the travel survey's origin and destination information

The universe represents around 26 million adults aged 15+ living in communities with 8,000 or more inhabitants (excludes rural areas) which is 63% of all South African adults.

Satellite images are continuously collected by Cuende over the same period of the travel survey data collection.

- A large number of images are obtained and examined that take into account various possible situations that may occur (different day parts, public holidays, weekends and seasonal differences) to ultimately arrive at consistent numbers.
- Satellite imagery analysis identifies positions of all the cars in a complete area, obtaining a census of vehicles in a certain area.
- Traffic flows in every street of any area in any given moment is obtained, allowing an understanding of how density of traffic and traffic flows for specific locations, areas, and streets.
- An index is then calculated to work out the average traffic intensity per street. This then provides a traffic intensity model.
- These figures are then used to assign the probabilities distribution or routes

1.1. External counts used in calculating audience volumes

No actual external traffic counts are used, volumes are calculated from the travel survey and density from the satellite imagery.

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

Visibility factors are assigned to each panel based on their own characteristics (size, location, panel orientation, visual sharpness, and obstacles) and includes whether a person is travelling in the direction of the panel.

These elements create the visibility zone.

Cuende has worked with opticians and ophthalmology specialists to define what is called visual sharpness and to obtain the population visual sharpness average.

This visibility zone allows us to move from an Opportunity to See measurement to a Likelihood to See measurement.

2.7. What constitutes a contact/impact/delivered impression

Likelihood to See - the output is distilled to a plain “Respondent & Probability to Contact” file

3. Use of a Travel survey to understand the journeys people make outside their homes

Size of audience and population is collected through a face-to-face travel survey which provides demographic as well as origin and destination information.

The survey gathers all travel behaviour over the past 7 days using a face-to-face recall questionnaire

As of 2022 part of the upper income population will be interviewed using an online survey because it is difficult to interview face-to-face in these homes. An assessment of the results will be conducted to ascertain whether this is a viable option that will stand scrutiny as a media currency.

A probability sample is drawn among those aged 15+, residing in South Africa in communities of 8,000 or more inhabitant

3.7. Approach to calculating reach/travel patterns

Traffic densities are then calculated by Cuende using satellite imagery from Maxar. This data is used to model probable travel routes based on the travel survey’s origin and destination information.

The audience data released in ROAD reflects the travel patterns within district municipalities within provinces. This means that the data does not reflect travel patterns across provinces but could in many instances reflect travel across district municipalities within a province where appropriate

4. Inventory Characteristics – how measured and stored.

Initially the media owners provided all the relevant information for each panel, to the OMC and then this was uploaded into the software as a batch by the software provider. Post initial upload, there were two ways that inventory data was uploaded:

1. Media owners with access to the software uploaded the information for new panels themselves and maintained their inventory.
2. Smaller media owner who did not have access to the software made use of the OMC Bureau which loaded the inventory of new members and maintained the database for them.

Historically, the following characteristics were provided:

Company, Site Code, Province and Area, Address, Site Type, Model, Panel Description, Size (height and weight), Number of faces, Position, Digital (or not), Illumination, Orientation to the East, Costs

The same information has been provided to MGE with the addition of photos. MGE will also calculate the distance from the road and the height above the ground.

Historically the OMC/Kuper Research have kept a monthly monitor of new inventory loaded, changes/edits to inventory and deletions of panels to ensure that there is an eye on the state of the database.

Once a year the OMC ran a full audit of all panels using an independent company to randomly check the panels to ensure that all the information supplied was in line with reality on the ground. These audits were primarily to check GPS coordinates as well as orientations to the road.

5. The method or approach to process these data into usable information

The probability of being exposed to a panel is derived from the traffic model and is based on the routes a respondent will use for specific trip.

Because the reach measurement is a time/frequency-based measurement the probability of exposure is also calculated on how frequently within the campaign period a respondent will take the route.

6. Data Delivery (delivery system, data reporting and delivery publishing)

Historically data was delivered within the Quantum software. The data was fully calculated by Cuende, and the users could run reach and frequency analyses based on any target market within the dataset. The data was available against individual panels or against a network of panels.

Going forward the data will be made available to users through MGE's IDS software. MGE will also provide the data fully calculated within the software

and users will be able to run panel or network data against any target market they require.

6.1. Delivery software to end users, and users access to these data

Cuende loads the inventory, demographic and traffic flow data on their Quantum software which is managed and serviced by Telmar in South Africa.

End users access the data through Quantum by paying a monthly subscription to Telmar.

As an extra incentive we have made the travel survey data available to subscribers for strategic insights. This data can be accessed via any cross-tabbing software package.

The OMC has set up a bureau to assist the smaller media owners who cannot afford the costs of subscribing to Quantum. The bureau provides a service for loading inventory, running campaigns, and providing any other information the media owners require

Additional areas of detail

i. Scope of measurement – environments/formats covered

Currently we only focus on any roadside inventory.

Most of the panels are roadside billboards of varying sizes.

The only requirement is that the inventory must be visible from the road to passing traffic or pedestrians.

ii. Volume of frames/locations

We have approximately 6,500 public panels loaded.

iii. Measurement of seasonality/variability across the year

None at this stage. We may consider this for future modelling.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

Currently we do not measure DOOH in our data. Due to the fact that we measure the past 7-day travel behaviour of respondents in a face-to-face survey, we do not have the granularity available to measure DOOH.

We have been using the AM4DOOH formula and calculating a potential DOOH audience based on the reach of static panels.

We use a GIS company called Esri who use HERE maps to provide us with average speeds on different days and dayparts. These speeds are fed into the formula to estimate the possible digital reach.

We have created an Excel worksheet for the media owners to use to assist with calculating the AM4DOOH formula.

v. The use of contemporary data.

At this stage we do not apply any contemporary data to our measurement, we only release data from our travel survey and traffic modelling methodology.

vi. Data release schedule.

Up until 2019 we had been releasing a new travel survey and a satellite imagery update once a year with a three-year rolling sample, with a sample of 45,000.

We then released a satellite imagery update 6-months after this release but using the same travel survey.

vii. The management of data privacy, and Personally Indefinable Information (PII).

Ask Afrika subscribes to the EU GDPR regulations as this is much more stringent than SA's POPI regulations which is currently being promulgated.

viii. The security, and sustainability of data supply.

Travel survey is 1st party data.

Volume data via Cuende.

ix. Trading metrics offered in market.

Reach, frequency, impacts, GRPs, costs and costs per thousands.

x. Governance or management structure

The OMC is a non-profit company with a Board of Directors, initially represented by members of the 4 founding members of the OMC, and subsequently a representative for the smaller members has been voted onto the board. The board approves all monetary spending and investments.

The daily running of the OMC is handled by the General Manager who reports into the BOD on a regular basis. Board meetings are held every quarter and an annual AGM is held to bring all members up to speed with what is planned for the year ahead

Depending on the number of panels that each member has loaded on the Quantum software and depending on the monetary investment, each member has a number of voting rights. The 4 founding members have the majority votes.

With the OMC having now reached 29 members in total, our first AGM was held in 2020.

xi. Funding structure

Our Travel Survey is funded by our members. The OMC started with 4 founding members who invested all budget required to get the research up and running. We have subsequently added on 25 new members.

The founding members have to date, heavily subsidised the smaller media

owners as the 4 founding members have more than 700 panels each. The small media owners have between 5 and 300 panels each. We charge a flat OMC membership fee per panel that the media owners upload onto the Quantum software.

Cuende bills the members directly for their once off uploading cost and then an annual membership fee that covers the upgrading and maintenance of the Quantum software as well as the use of the Maxar digital satellite traffic images.

xii. Data/research/platform partners

- Ask Afrika — Fieldwork and processing of the travel survey.
- Cuende Infometrics — Data processing and traffic modelling.
- Kuper Research — Technical oversight and scrutiny of data.
- Cuende/Telmar — Quantum – media metrics/inventory tool
- As of 2022 the South African JIC has changed their data processing and modelling partner to MGE Data

xiii. Approach to Cross Media Measurement

None at this stage but would be extremely interested in doing so.

We have ensured that the methodology and process of ROAD will stand scrutiny by the high media currency standards that exist in our market and is therefore a comparable source of information should we have access to any cross-media measurements that could exist in the market in the future

3.8. Market Analysis - Sweden, *Outdoor Impact*

Summary

Outdoor Impact (OI) – the system that provides the currency for outdoor media for buyers and sellers. The current Simon Cooper system is known as OI 1.1. and the upcoming Ipsos system is called OI 2.0.

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

TIM – Traffic intensity modelling (in Sweden, HERE is the main source for traffic modelling)

1.1. External counts used in calculating audience volumes

Public travel data. from sources such as Trafikverket (National Transportation Authority) and public (national/regional) transport operators. This gives data for cars, bicycles, trains, buses, trams and (to a lesser degree) pedestrians.

Data from property owners. Shopping malls report visitor volumes to HUI (The Retail Research Institute), and OI verifies this using different methods. Most malls use ViaMetrics to measure traffic volumes, and OI works directly with ViaMetrics to verify the data. For other malls, an independent media auditor, ECI, is employed to verify the data.

For national railway stations the data is supplied by Jernhusen, a publicly-owned property company set-up to own and manage all national railway-related real estate.

For commuter train stations, underground stations and similar, data is supplied by the relevant local/regional transport company.

Calculated data. For panels outside supermarkets etc., traffic volumes are calculated based on the store's revenue divided by a benchmark figure for average sales receipt. Store revenue is provided through an independent retail analysis firm (Delfi) and average sales receipts are available through a consumer spend study conducted by GfK that has data for around 400 different retail operators.

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

VA – Visibility adjustment

ROTS – Realistic opportunity to see

VAC – Visibility adjusted contacts

2.8. What constitutes a contact/impact/delivered impression

VAC – Visibility adjusted contacts

3. Use of a Travel survey to understand the journeys people make outside their homes

Consumer research data. As part of the Ipsos contract, Ipsos conducts two types of consumer travel research:

A panel survey, where people list their travel habits (3000 respondents)

An MST study, where consumers carry a tracking device mapping their actual travel behaviour. The initial plan was to run the MST study for four years (1000 respondents per year), from 2019 to 2023, but as Covid-19 has impacted travel patterns, the MTS study was halted in spring 2020. It was restarted in Q4 2021 in line with the removal of Covid 19 restrictions issued by the Swedish public health authorities.

3.8. Approach to calculating reach/travel patterns

Traffic flows for roadside are modelled in a traffic intensity model (TIM) based on the traffic counts for each individual mode of transportation, using the HERE traffic database to distribute traffic flows between measurement locations.

Traffic flows for indoor locations are modelled in the same way, using digitized maps to identify traffic flows probabilities based on entrances/exits, the layout of the area, existence of anchor stores, facilities etc.

Each object is registered in a geographic database, the inventory management system (IMS), where established criteria for visibility adjustments are applied (size, distance from traffic flow, angle to traffic, restrictions to view etc). This, together with the TIM gives each object its ROTS and VAC numbers.

The two sets of travel surveys and the travel patterns these generate is then used to create reach and frequency data for the population as a whole and broken down by the different audience attributes (age group, gender, geography).

4. Inventory Characteristics – how measured are stored.

Each object is registered in a geographic database, the inventory management system (IMS), where established criteria for visibility adjustments are applied (size, distance from traffic flow, angle to traffic, restrictions to view etc). This, together with the TIM gives each object its ROTS and VAC numbers.

The TIM is updated annually in accordance with the updates to the HERE database.

5. The method or approach to process these data into usable information

Media owners specify their commercial offering (networks of objects) in the

inventory delivery system, IDS. The IDS provides the VAC, reach and frequency figures for these networks, or combinations of networks. The IDS also breaks down the data by region and audience criteria. Advanced buying side users have more opportunities to work ad hoc in how they combine objects and networks in their campaign planning, but as general principle for the market the focus is on combinations and networks rather than buying individual locations.

The IDS includes five regions: the cities of Stockholm, Gothenburg and Malmö with their respective surrounding areas each form a separate region; a fourth region covers the remaining cities in the top 20 based on population (i.e. cities ranked #4 - #20) and the fifth region represents the rest of the country. Regional VAC, reach and frequency outcomes are primarily calculated based on the people living in the same region, but travel to/from the region can also be included in the model.

6. Data Delivery (delivery system, data reporting and delivery Publishing)

The IDS outlined above is updated quarterly. At present, three of the four updates in a year will only include updates to the inventory, whereas as the fourth update will also include updates to the traffic data (TIM) and the travel survey results.

6.1. Delivery software to end users, and users access to these data

The IDS comes in two versions, standard and advanced. Both are web-based and without cost to users. The standard version is a simplified format, with a more graphic interface, where the options in terms of target groups, networks of objects, regions etc. are pre-defined. This version has no login requirements. It is based on IDS but with a presentation interface created in Tableau.

The advanced version is for registered users only, but registration is free and open to anyone. This version means that the user works directly in the IDS.

Additional areas of detail

i. Scope of measurement – environments/formats covered

All forms of outdoor media, both roadside and in shopping centres, stations etc., except certain parts of public transport (on buses and inside buses/trains) and airport (in-terminal) advertising.

ii. Volume of frames/locations

OI 2.0 has around 40 000 surfaces, i.e. static panels, dynamic panels and digital screens. Digital screens represent around 30% (at start of 2021).

iii. Measurement of seasonality/variability across the year

Given Sweden's geographic location, with large differences in daylight throughout the year and across the country, seasonality is a natural component, and calculated for six different geographic regional bands from north to south

iv. Approach to measuring DOOH and the granularity that this data is available to your users

The system includes visibility adjustment factors that differentiate between fixed and digital screens, and also includes adjustments based on spot length (5 vs 10 seconds) and spot rotation length (normally 60 seconds). The current level of MST travel data does not permit specific breakdown of exposure into dayparts, but the required level of survey data for this is expected to be reached by the end of 2022 so that this level of granularity can be provided by early 2023.

v. The use of contemporary data.

The OC has started to discuss additional data sources such as mobile phone/ GPS tracking data, but has not yet made any decisions on this.

vi. Data release schedule.

Once OI 2.0 is launched, the plan is to issue new releases of OI 2.0 on a quarterly basis

vii. The management of data privacy, and Personally Indefinable Information (PII).

PII generated by the use of MST meters are managed by Ipsos, MGE as the data controller

viii. The security, and sustainability of data supply.

External data is predominantly public data, travel patterns and reach calculations are based on 1st party owned data

ix. Trading metrics offered in market.

VAC – Visibility adjusted contacts, plus reach and frequency for campaign planning

x. Governance or management structure

There are three main bodies in the management structure

1. Outdoor AB (OAB) is the "holding company" responsible for the common currency. OAB is the contract partner for Ipsos. OAB is owned by Clear Channel (49%), JC Decaux (49%) and Sveriges Annonsörer (the Swedish Advertisers' Association, 2%), The OAB board has an independent chair, Carl Wåreus from Google, but Carl has a long and distinguished career in marketing and advertising, including CMO of McDonald's and CEO of both DDB and OMD.

2 Outdoor Impact (OI) – the system that provides the currency for outdoor media for buyers and sellers. The current Simon Cooper system is known as OI 1.1 and the upcoming Ipsos system is called OI 2.0.

3 Outdoor Committee (OC) – the ”formal” JIC, where decisions on data, models, specifications etc. are made. OC has representatives from all media owners in the system, including Ocean Outdoor and Leeads, as well as fromSveriges Annonsörer and media agencies. OC is also chaired by an independent representative, Mats Rönne, who (similarly to Carl Wåreus) has a long track record that spans senior client and agency roles, including former chairman and director of Sveriges Annonsörer.

Staff: OI is managed by a project manager, Ulrika Danielsson. Ulrika and Mats are the only central resources within the OAB/OI set-up. The acronym OI is also used in this report to indicate work done centrally to manage audience measurements.

In addition there is an IAB task force for digital OOH. This is a separate group managed within the IAB structure, but given the nature and size of the business most of the people in this group are also involved in the OC structure.

xi. Funding structure

The funding of the system is split into CAPEX and OPEX, where CAPEX costs are covered by OAB and split equally between the participating media owners Clear Channel and JC Decaux. OPEX is shared pro rata between participating media owners in the OI system, where 50% of the fee is based on the media owner’s share of total objects in the system and 50% on the media owner’s share of “theoretical revenue”, i.e. 100% of inventory sold at 100% of list price. Irrespective of the outcome of the pro rate calculation there is a minimum fee of SEK 100 000.

For advanced users in OI 2.0 there will an opportunity to become a certified user. The certification comes with a small fee, and in return the certified users will be listed on the OI web site.

xii. Data/research/platform partners

Ipsos, MGE

xiii. Approach to Cross Media Measurement

Sweden, and especially Sveriges Annonsörer, is an active partner in the WFA work on CMM. In addition, the Swedish approach is to include all media channels and formats, not just video screens. OI is an active partner in the project group working on this for Sveriges Annonsörer, and in addition JC Decaux is a sponsor of the project. OI/OOH is seen as one of the role models for CMM, as OOH is governed through a JIC and uses independent/third party data for all measurements.

3.9. Market Analysis - Switzerland, *Swiss Poster Research Plus Ltd. (SPR+)*

Summary

Swiss Poster Research Plus Ltd. is the scientific, neutral, transparent research institute for Swiss out-of-home media and mobility. It is supervised by the Research Advisory Council. Over 60'000 OOH and DOOH advertising faces of the providers APG|SGA, Clear Channel Schweiz, Neo Advertising, Swissplakat, Livesystems and horizon! are recorded in the system. These faces/screens are located on streets, railway stations and shopping centres. In the SPR+ Expert planning tool, OOH and DOOH campaigns can be simulated, planned, optimised and controlled. The SPR+ Expert delivers contacts per advertising face/spot weighted by visibility as well as net and gross reach, OTS, GRP, CPM, CPP and affinity for cross-provider outdoor advertising campaigns. The research model complies with ESOMAR's global guidelines for outdoor advertising research. Switch-on plans with cost, performance and panel overviews can be created at the push of a button. SPR+ has a national mobility model including passenger frequencies for every road section in Switzerland.

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

The national mobility model of SPR+ covers the mobility of the entire population living in Switzerland. For each of the approximately one million road sections, it is known how many vehicles and pedestrians move on them, as well as where they come from and where they are going. In addition, socio-demographic characteristics such as age and gender are known for each of these people.

1.1. External counts used in calculating audience volumes

Population (age and gender) for every building in Switzerland with coordinates (FSO, ARE)

- Households geocoded (FSO)
- NOGA working places geocoded, with business field, and no. of employees for every building in Switzerland with coordinates
- Traffic measurement (FSO, SPR+) with 10'000 counting points
- Micro census mobility and transport (FSO, ARE)
- Speeds for all Swiss street segments with 15 minutes granularity (HERE traffic patterns)
- Railway station frequency measurements (SBB)
  - Boarding, alighting, transferring, transit passengers
  - Edge frequencies
  - Total frequencies

- Shopping malls frequency measurements (mall operators)

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

The national mobility model and the outdoor advertising faces are set in relation to each other and the following visibility weightings are included in the model:

- Frame size
- Visibility distance
- Angle of passage
- Speed of passage
- Illumination/Time of day
- Height: Tunnel, street level, bridge
- Clustering (number of faces per outdoor advertising location)
- Temporal visibility
- Digital attraction

2.9. What constitutes a contact/impact/delivered impression

Visibility adjusted contact – Likelihood to see Face/spot was a) physically visible and was b) looked at with the human eyes.

3. Use of a Travel survey to understand the journeys people make outside their homes

More than 11'500 test persons were equipped with GPS trackers, with which all movements of the persons were recorded for seven days. The GPS tracks not only provide individual routes of the test persons, but also allow statements to be made about the variability of the routes - in terms of route length as well as spatial dispersion. In addition, the mobility in residential areas is mapped very precisely via the GPS data, which is incorporated into the route generation for the National Atlas as well as into the route model.

3.9. Approach to calculating reach/travel patterns

The "knowledge matrix" component contains in concentrated form the results of the mobility atlas, route model and panel-specific information. The contents of the matrix are processed and scaled in such a way that they can be understood as probabilities with which a person enters a street segment. A balancing algorithm (iterative proportional fitting) is used to adjust the matrix so that the sums of the columns each realise the segment frequencies of the mobility atlas. The row sums are adjusted to the micro census daily distances.

With the knowledge of which advertising faces are positioned in which angle at which segments, the contacts can now be summed up over all persons. In particular, it is possible to perform target group-specific calculations, e.g. for all men between 30 and 40 in the city of Zurich.

The method described above is simplified. Additional parameters enter into the calculation. These are realised in the form of panel-specific or panel-segment-specific devaluation factors.

4. Inventory Characteristics – how measured and stored.

All 60'000 analogue and digital outdoor advertising faces are digitally recorded and geocoded in relation to the HERE road network. Many individual characteristics of the outdoor advertising faces are included in this process. All information is stored in the central database. Using vectors from all buildings in Switzerland every single face has an individualized visibility area.

5. The method or approach to process these data into usable information

The micro census contains detailed information on the mobility behaviour of more than 33'000 resp. 54'000 Swiss people, respectively, representative of the entire Swiss population. This information is transferred to the population according to the weight of the micro census persons. Thus, each person is assigned a set of trips that satisfy the statistical data of the micro census (e.g. number of trips, length of trips) for an average day. In addition, the routes of more than 10'500 test persons determined by GPS are integrated. In this way, paths are generated from every household in Switzerland for every person registered in the household, taking age and gender into account and considering POI-specific characteristics (coordinates, number of employees in establishments).

A "Knowledge Matrix" of rows that represent the approximately eight million persons of the Swiss resident population and the columns represent the approximately one million road segments. Thus, in its basic form, the matrix has 8 trillion fields. In addition to the street segments, it also contains railway station and shopping centre segments, which are treated according to the same procedure. The contents of the matrix are processed and scaled in such a way that they can be understood as probabilities with which a person enters a street segment. A balancing algorithm (iterative proportional fitting) is used to adjust the matrix so that the sums of the columns each realise the segment frequencies of the mobility atlas. The row sums are adjusted to the micro census daily distances.

With the knowledge of which advertising faces are positioned at which segments, the contacts can now be summed up over all persons. In particular, it is possible to perform target group-specific calculations, e.g. for all men between 30 and 40 in the city of Zurich.

6. Data Delivery (delivery system, data reporting and delivery Publishing)

The results are made available to the market in an online planning tool that is independent of individual outdoor advertising providers and enables the individual calculation of performance values of cross-owner outdoor advertising campaigns and individual faces. Market proximity and market dialogue are ensured by the Research Advisory Council.

SPR+ Expert is a web-based Java application that runs on all common operating systems. The choice of this architecture allows for clear data separation. The research data is kept at SPR+, while the sensitive campaign data is stored exclusively on the client's computer as a local file. In addition, the technology minimises the administrative effort for the user, as programme updates are carried out on the SPR+ server.

6.1. Delivery software to end users, and users access to these data

SPR offers a range of tools to the OOH market with an intuitive UI interface.

"SPR+ Expert", the user interface for the online evaluation of faces and campaigns designed with four components that follow the usual planning process for OOH

SPR+ Studio – audience and budget planning

SPP+ Product – availability and trading

SPR+ Planning – Scenario planning and audience metrics, with optimisation

SPR+ Control – campaign evaluation

Additional areas of detail

i. Scope of measurement – environments/formats covered

Roadside, Railway Stations, Shopping Malls.

ii. Volume of frames/locations

Currently, over 60'000 analogue and digital outdoor advertising faces are recorded in the system. Updated twice a year

iii. Measurement of seasonality/variability across the year

In 2022 seasonality will be introduced with different weighting for each month. Basis is an app based panel, telco data, shopping centre data and data of the Swiss national railway company.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

For digital advertising faces, the international standard from the AM4DOOH research project was adopted and integrated into SPR+. Data delivery for spot length of minimum of one second. Results per spot/loop are differing

according to the time of the day and weekday. Spot and loop length is 100% flexible. VAC for spot: Spot was

a physically visible during the passage and was

b looked at with human eyes.

v. The use of contemporary data.

Currently under evaluation to implement mobile phone data from telecommunication providers in order to weight the plan (model) data according to effective situation during the campaign period. Weather, holidays, sport events, demonstrations and many more factors will cause that reality at a certain point in time is different than the plan data. With this weighting the real performance can be calculated during the campaign and thereafter.

vi. Data release schedule.

Twice yearly

vii. The management of data privacy, and Personally Indefinable Information (PII).

SPR+ is fully GDPR compliant

viii. The security, and sustainability of data supply.

Travel survey is 1st party data, structural and population data are from publicly available or publicly accountable sources – see section 1.1.

ix. Trading metrics offered in market.

Net reach for campaigns and contact value per face/spot, gross reach, OTS, GRP, total cost, CPM, CPP and affinity. . Target area and universe can be defined individually and gradually by the user from a single community up to the nationwide level.

x. Governance or management structure

SPR+ is the only research institute in the field of out-of-home research that makes its concepts, models, methods, data inputs, weighting criteria with their factors and the results absolutely transparent. This is the only permissible scientific approach. Any other approach would not be serious research, but at best marketing. It also ensures the neutrality and objectivity of SPR+, which is a very important client concern. SPR+ is supervised by a Research Advisory Council. The members represent advertisers, media agencies and media owners.

xi. Funding structure

SPR+ operates on a licence fee basis based on number of users and usage of the tools. . The base funding is guaranteed by the participating media owners via long term commitment according to their inventory size.

xii. Data/research/platform partners

Fraunhofer Institute for Intelligent Analysis and Information Systems (IAIS) has been commissioned with the modelling.

The planning tool was programmed in a collaboration between the software developers of Karakun and the Fraunhofer Institute.

The recruitment of the test persons, the traffic counts and the field interviews are carried out by the market research institutes LINK and GfK Switzerland

The companies MGE DATA and Geosat are responsible for the state-of-the-art GPS technology and the related technical aspects.

xiii. Approach to Cross Media Measurement

SPR+ is delivering OOH/DOOH Data to WEMF Ltd. who is conducting the MA Strategy Consumer study that delivers data via an online planning tool. With this tool OOH/DOOH can be planned on the strategic level in combination with all other media as well as with consumer data. OOH/DOOH data is integrated via fusion and touchpoints.

3.10. Market Analysis - UK, *Route*

Summary

Route's remit is to provide accountability for the Out of Home (OOH) medium by publishing audiences that have seen OOH advertising in Great Britain. Route's audience measurement data launched in February 2013 and has seen continual development since. Most recently the provision of spot ratings for digital screens in April 2020. Route provides gold standard audience measurement and common metrics for use as currency across all OOH environments.

Route Audience data is available for single frames/screens to complete campaigns nationally, at a temporal granularity of any combination of 15minute segments up to one year in duration.

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

A Traffic Intensity Model (TIM) ingests volumetric traffic figures at known locations from external sources and maps the volume of vehicles and pedestrians along all roads/paths based on a digitised network of 4.5 million links supplied by HERE, with classification characteristics appended. Frame locations, and the links they can be seen from, are attached to this model.

The model creates volumes of traffic around the network, with vehicle volumes fed by 28,064 Annual Average Daily Flow (AADF) counts at specific locations (from the Department of Transport) and road counts from Local Authorities. The vehicular element of the current model is also informed by additional research, looking at typical flows on smaller road types where AADF counts are less likely to be available.

The pedestrian model is a gravity model, fed by counts from point of interest attractors, for instance, stations, transport hubs, schools, hospital and so forth.

All HERE road links are assigned a weekly TIM audience for both vehicles and pedestrians. The audience for each is then split over 672 quarter hour periods across the week.

The model for roads is matched by similar models created for other environments, fed by multiple external population counts of travellers/visitors. Flows and counts ae matched to HERE venue maps or interior maps digitised for Route.

The suitability of available count datasets is assessed and graded before use. Alternatives are reviewed as and when they become available.

1.1. External counts used in calculating audience volumes

AADF (Average Annual Daily Flow) Traffic counts from the Department for Transport; NTS (National Travel Survey); Bus depot volumes, digitised bus routes; NAPTAN – the National Public Transport Access Node dataset for bus

stop locations and frequency of buses by day-part; RODS (Rolling Origin & Destination Survey). Annual survey of London Underground travellers; LUUS (London Underground Users Survey)/DLR (Docklands Light Railway Survey); Underground, DLR and Glasgow U gate line data; TSGB (Transport Statistics Great Britain); NRTS (National Rail Travel Survey); LENNON (Rail Ticket Database); Civil Aviation Authority (CAA) Gate room survey; PMRS Pedestrian footfall data; Experian daytime and retail counts; Local Data Company – high street footfall counts.

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

Route uses 25+ years of experience in eye tracking research to create an adjustment model that calculates likelihood to see based on both frame and audience attributes. The model first defines the areas from which it is possible to see posters and screens (using the maximum visibility distances within an unobstructed field of vision) and then latterly calculate a 'visibility adjustment' factor which accounts for the likelihood of people seeing the ads when they are in visibility areas.

An adjustment for the likelihood of seeing each frame/spot is calculated from every possible approach path. A further adjustment for the effect of digital or scrolling movement.

The visibility models account for:

Time spent within the visibility areas, the size of the frame, the distance from the frame, the "offset" distance – how far removed from the flow path is the ad, The distortion, or angle at which the poster/screen sits relative to the person, Illumination, Dynamic movement, and mode of transport (vehicular, pedestrian)

For every 0.1 seconds that contacts spend within visibility areas, we calculate the likelihood of it being seen using the variables outlined above. These fractionals are aggregated to give total 'contact visual adjustment' which are in turn aggregated for each frame to give a total frame visual adjustment

This is then applied to the total traffic on the links within the visibility area by mode to provide a measure of impacts

2.10. What constitutes a contact/impact/delivered impression

An audience contact is currently defined as an individual having the "likelihood to see" the advertising structure. This means that they are travelling on links within the defined visibility area in a direction towards thew ad where it is possible to see it. This is then more tightly defined as the "realistic opportunity to see" (ROTS) adjusted by a visibility coefficient and known as "visibility adjusted ROTS".

A contact is an "eyes-on" the advertising structure (panel, screen etc.) to the extent of the visibility adjusted ROTS, with the output in the data as impacts

3. Use of a Travel survey to understand the journeys people make outside their homes

A Travel Survey of 7,200 participants per annum, nationally representative, recruited face to face to carry a passive Multi-Sensor Tracking meter (MST) for a period of 14 days. This records their interior and exterior location, second-by-second, using GPS and a number of other sensors.

Route uses a multi-year database, comprising 25,447 participants carrying MST devices between September 2016 and February 2020, which is weighted and grossed to population estimates provided by JICPOPs

3.10. Approach to calculating reach/travel patterns

A probability model for each environment allows periods from 15minutes to one year to be analysed. Data from the questionnaire completed by Travel Survey participants inform the frameworks for these models by identifying the total pool of travellers/visitors for each environment, their frequency of travel over the course of a year and where they live.

To ensure an appropriate geographical spread for the build in reach over time, this involves creating Travel Zones for each environment i.e. participants are clustered into geographical zones, and all members of the cluster are attributed a probability of undertaking travel. This results in the generation of virtual frame contacts in addition to the actual contacts observed in the Travel Survey, albeit with lower probabilities.

Estimates of net reach for different combinations of frames (which may be in different environments) are derived from the actual and virtual contacts – the former derived from the Travel Survey and the latter from the probability model, in both cases taking into account likely visibility.

4. Inventory Characteristics – how measured and stored.

Details of OOH inventory for each environment are provided by Outsmart via the SPACE database. Further attributes required for the calculation of visibility areas and the application of the visibility model are added by Media Owners into an Inventory management System (IMS). The IMS is subject to peer review. The inventory in the Route data are updated on a quarterly release cycle.

5. The method or approach to process these data into usable information

Route data is the outcome of a series of data models which are brought together in the output data.

A methodology has been developed for each specific environment, and each must be implemented separately before the data are published in a single database allowing for analysis of the different environments in combination.

Although the underlying principles of the methodology are common across environments, adaptations are needed to take account of the specifics to each – for instance whether the environment is open sky or indoor, whether the advertising is moving or static, the nature of the population count data, and any potential weaknesses in representation.

For roadside a digitised map and TIM is held based on the HERE link network. Similar digitised maps and models are held for other environments.

External population data are used to estimate weekly visitor flows. These are held separately for pedestrians and vehicles for those environments that have both. In conjunction with the behavioural models above, they yield an estimate of the audience in contact with each frame i.e. the number of impacts generated.

The calculations for digital frames must also take into account that the amount of time any particular 'spot' will be in view will only be a proportion of the total time the frame is in view – because the ads are rotating copy.

Factors are applied in respect of illuminated and unilluminated frames and in parallel day-time and night-time factors by month and region. These enable the outputs to account for profiling by different parts of the year and the effects of illumination versus non-illumination.

All factors are applied to the external count data before the final audience numbers are generated.

The quality of contact/visibility is determined and appended to each virtual or actual frame contact.

6. Data Delivery (delivery system, data reporting and delivery publishing)

The Route data provider, Ipsos, supply a number of files to approved data bureaux and software analysis systems containing prepared datasets which are be combined 'on-the-fly' when users run their campaign analyses, by means of a proprietary algorithm.

In a separate file are the estimates of the audience in contact with each frame i.e. the number of impacts generated. As above, these are based on the external population data at day part level, after the relevant factors are applied to account for the likely visibility of the frame.

The key functions of the algorithm are:

1. To moderate the probability reach to the actual reach (from the travel survey) at 2 weeks
2. To moderate the traffic volumes to the travel survey

6.1. Delivery software to end users, and users access to these data

Route does not offer delivery software for the analysis of data - Stakeholders analyse the data either via licenced data bureaux's software systems, their own UI, or via the Route API which is provided by Mediatel.

Additional areas of detail

i. Scope of measurement – environments/formats covered

Roadside

Tube & urban transit systems (stations & rolling stock)

Rail (stations, rail side & rolling stock)

Buses (exterior only)

Taxis (exterior only)

Airports (interior and exterior)

Indoor shopping centres

Outdoor shopping centres

Supermarket car parks

Motorway service station car parks

ii. Volume of frames/locations

370,000 Frames and 12,000 Screens (June 2021)

iii. Measurement of seasonality/variability across the year

At present Route features monthly volumetric factors applied to both reach and impacts within environment at regional levels. This allows us to account for monthly variances and hence audiences will differ by month. Monthly factors are derived from volumetric counts, where available, or from the Travel Survey contacts.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

- A 'spot' is the broadcast of a single ad on a single screen.
- A 'spot duration' is the time that the spot is on screen for.
- The 'gap length' is the duration that the ad is not on screen for – the time between spots.
- A 'spot schedule' is the combination of the spot duration and the gap length

Route currently has capability to output audiences for any user defined spot duration from one second through to one week.

Spot schedules are standardised within 15-minute increments. This means that a spot schedule running at any time within a quarter hour period will

deliver the same audience. i.e. a 5/25 spot schedule on screen at 9:01am will deliver the same audience as one at 9:14am but it may be different to that running at 9:16am and 9:33am.

The user defines: Which frames/screens are included in the schedule; the time period(s) that the campaign is scheduled to broadcast on each frame; the campaign duration; the spot duration; the gap length

Using these inputs, alongside the matched exposure data from the Travel Survey (i.e. people in the relevant visibility areas at the selected times) we first calculate the number of times the ad will play and then the average overlap of time in the area and the time on screen. With this we modify our visibility adjustments to enable the viewing of multiple spots in the same exposure where appropriate.

v. The use of contemporary data.

Contemporising data from various sources including telco and ticketing information are currently under review for use as contemporising factors.

vi. Data release schedule.

Quarterly data releases for updated inventory, contemporising factors

Annual release for population counts, overall map and routes, travel survey updates.

vii. The management of data privacy, and Personally Indefinable Information (PII).

Route's data is all opt-in and adheres to MRS guidelines and all data protection requirements. Route does not hold nor access any personally identifiable information.

Ipsos is the data controller for Route data, with MGE Data responsible as the data processor and ensure full GDPR compliance.

viii. The security, and sustainability of data supply.

Route Travel Survey data is based on primary survey + passive meter data which is sustainable, if challenging, with the current data collection means (face to face) – particularly in light of declining response rates, notably amongst young, urban males.

We also rely on secondary (predominantly free) third party volumetric data which populate the Traffic Intensity Model. These tend to emanate from government agencies and so no imminent threats to the continuity of provision is anticipated

ix. Trading metrics offered in market.

Reach: the unique number of people seeing the campaign

Cover: the proportion of the target audience who are exposed to the campaign (Population / Reach)

Impacts: the total number of times the target audience sees the campaign

(Reach * Frequency)

Frequency: the average number of times those exposed to the campaign will see it. (Impacts / Reach)

Gross Rating Points (GRPs): a measure of campaign effect. (useful for cross-channel comparisons)

x. Governance or management structure

As a Joint Industry Currency (JIC), Route is independent of any special interests. Its board of directors has an equal representation from the buyers and sellers of the medium. An action group considers the approach to the research methodology and its future direction.

Route is committed to a continuous programme of research and development to meet the evolving needs of the marketplace.

The Joint Industry Currencies (JICs) are owned by the industry – advertisers, agencies and media owners – to provide transparent and objective audience measurement for each medium. These data are produced and sold at cost providing both industry accountability and a robust trading currency for each medium

xi. Funding structure

Route is a non-profit making organisation, run on commercial principles. The trade associations for the buyers and sellers of the medium underwrite Route jointly.

Route receives additional income from subscriptions to the service.

xii. Data/research/platform partners

Ipsos, MGE, Lumen

xiii. Approach to Cross Media Measurement

Route has had initial discussions with ISBA about the Origin project and it's potential to read in digital OOH data at a later point, however this is very early stages and would require a change in what Route delivers in order to 'fit' with the proposed TV + Video measures being developed.

Route data is available via the Institute of Practitioners in Advertising (IPA) cross media tool 'Touchpoints' which gives predictive estimates for cross media reach based on environment, format group and GRP.

The Route questionnaire has been designed to include other media consumption, to allow for 3rd party fusions with other audience measurement models

3.11. Market Analysis - US, *Geopath*

Summary

Established in 1933, Geopath, originally the Traffic Audit Bureau for Media Measurement Inc., is a not-for-profit organization governed by a tripartite board comprised of advertisers, agencies, and media companies. Geopath's historical mission was to audit the circulation of out of home media in the United States.

Our organization has now expanded its historical focus. Geopath looks to the future with state-of-the-art audience location measurement, deep consumer insight, and innovative market research. We use state-of-the-art data, technology, and media research methodologies along with a holistic, integrated approach to provide powerful tools that measure and analyse audience location and show how consumers engage with out of home advertising.

Geopath is the industry standard that powers a smarter OOH marketplace, with over 400 members currently.

1. Population/volume/OTS – The approach to measuring overall volumes of available audience

Volume calculated through observed trip data, calibrated by road capacity, traffic speed, with demographics applied from observed journeys, benchmarked to US census/Caritas household data, and PRIZM segments. Applying an activity based model to create a complete dataset for all US road links – based on HERE mapping. All vehicular and pedestrian flows are calculated simultaneously creating OTS using Streetlytics.

1.1. External counts used in calculating audience volumes

1.5m external traffic counts used, weighted by historical relevance

HERE circulation metrics

Citilabs – pedestrian count data (Streetlytics)

DOT Traffic counts – federal, local and from private toll roads

Speed data – HERE

2. Visibility Adjustment applied to understand the relative impact of different types of posters.

Geopath bespoke eye camera research in real world scenario's judging fixation rates based on distances, frame characteristics and duration of passage. Fixation rate applied to calculated visible duration of any frame based on its characteristics to flow of audience

2.11. What constitutes a contact/impact/delivered impression

Visually Adjusted Contact (VAC)

3. Use of a Travel survey to understand the journeys people make outside their homes

Anonymised mobile app location data, calibrated weekly determine journeys and trip types to create a trip matrix for origin to destination based on number of persistent devices.

Initially created using 18months of movement data, pre covid, and augmented using current data to forecast future travel behaviour.

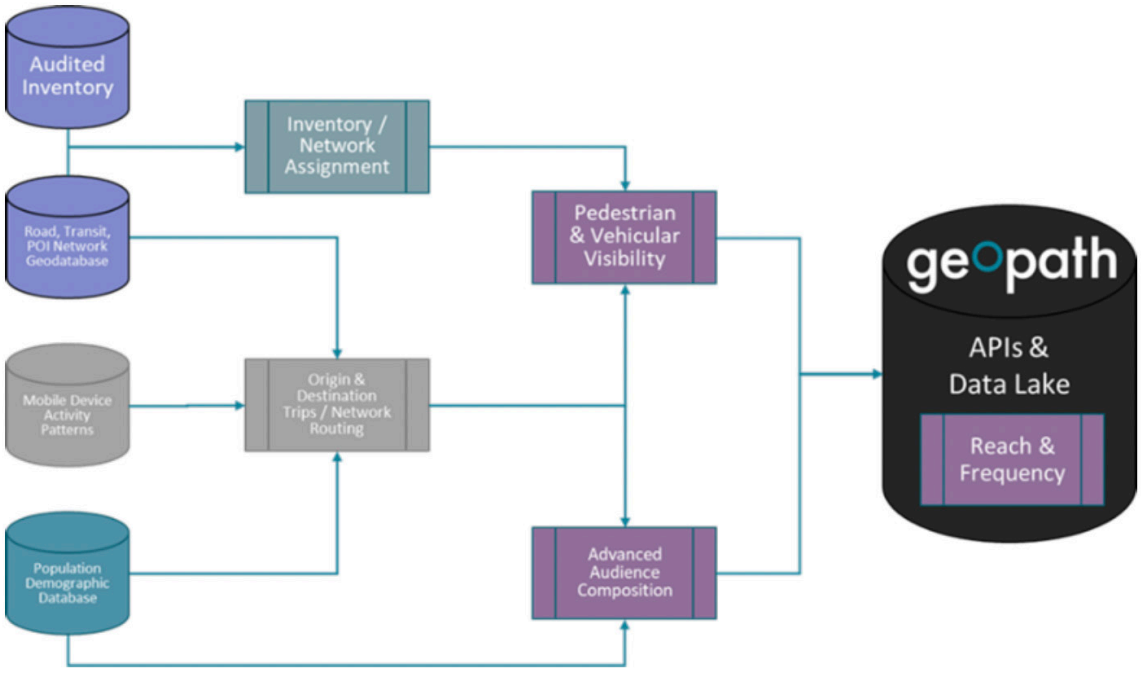
3.11. Approach to calculating reach/travel patterns

Intermx aggregated and cleaned SDK data used to understand travel behaviour and audience composition. Recalibrated weekly to accommodate sample churn and based on three trip types.

4. Inventory Characteristics – how measured and stored.

Geopath hosts a fully audited inventory database of all OOH assets measured, including all appropriate attributes and asset photographs. Published via API/ Insights suite alongside being used to calculate Audience metrics.

5. The method or approach to process these data into usable information



6. Data Delivery (delivery system, data reporting and delivery Publishing)

API's, Data lake, Geopath UI - Inventory search, Audience search, Market planning, Campaign delivery

6.1. Delivery software to end users, and users access to these data

Geopath UI – Inventory search, Audience search, Market planning, Campaign delivery

Additional areas of detail

i. Scope of measurement – environments/formats covered

- Roadside – Billboards, posters, Street Furniture
- Place-based Media – Transit Stations, Commercial, Entertainment
- Fleet/Mobility Media – Transit Scheduled, Dynamic, On-demand
- Event Based Media – Event, Experiential

ii. Volume of frames/locations

~750,00 frames, made up of 500k roadside and street furniture, with 250k place based and transit frames.

iii. Measurement of seasonality/variability across the year

Geopath is currently reviewing a move to offering seasonality in our predictive planning data based on monthly changes in reach and frequency patterns.

iv. Approach to measuring DOOH and the granularity that this data is available to your users

DOOH frames have additional attraction factors based on illumination an movement/transition, applied to existing visibility model. Dwell time and spot length used to calculate increase in overall OTS of a frame which can then be proportionately applied to spots within that frame.

Frame data is available for a standard week at single hour granularity.

Currently developing more temporal granularity to accommodate analysis of multiple audiences and spot display lengths, allowing for data suitable for campaign reconciliation.

v. The use of contemporary data.

Geopath offers contemporary mobility data to be used alongside currency data but does not currently apply contemporising data to currency historically. Since May 2020 a weekly 'Impression Variation Report' has been produced giving impression moderating factors by media type and market (at CBSA level), based on Intermx weekly historical data.

vi. Data release schedule.

The current cadence of Geopath Insights data updates is annual, with a mid-year update produced in 2021, which is the current data set. Next release scheduled for Q4 2022, with plans to move to a monthly release.

vii. The management of data privacy, and Personally Indefinable Information (PII).

Geopath does not leverage any personal identifiable information for its measurement. The data is anonymized and aggregated to the Census Block group level by Geopath's data partners before it is used for developing Geopath Insights. Geopath's data partners comply with all national and state privacy regulations, and conduct privacy audits with their data sources.

viii. The security, and sustainability of data supply.

Intermx has supplied data for Geopath since 2017, Streetlytics since 2016

Count data is either 1st party or publicly available

ix. Trading metrics offered in market.

Reach, Frequency, impressions (VAC), GRP by demography - both in-market impressions and total impressions.

x. Governance or management structure

Tri-partite board made up of media owners, media buyers, with representation from advertisers. Technical committee made up of representatives of the board

xi. Funding structure

Subscription model based on company size

xii. Data/research/platform partners

Intermx

Bentley – Streetlytics

Behaviourly (Perception research Services)

xiii. Approach to Cross Media Measurement

Geopath does not provide cross media measurement, but does provide media consumption profiles in the output data to allow 3rd party fusions with other audience measurement models.

The Need for Clear Definitions in OOH metrics:

Defining the terms used to describe audience metrics should be consistent throughout methodological documentation and in all published materials, to allow for currency to be both understood and adopted.

Several terms used in OOH audience metrics differ in their definition by territory and reflect the usage of those terms across other media in those territories. Although it is tempting to suggest a consistent usage of all terms for OOH globally, that would ignore both existing, established usage and multiple languages. So, to promote the usage of OOH metrics it is important to consider the understanding of the terms used in the local market.

For OOH metrics to be adopted more readily in any market, they should be comparable to other media metrics already in use, and where equivalents are required, they should be made clear to end users and advertisers.

4.1. Contact, Impression or Impact?

The use of terms such as Impression, or Opportunity to See, must be defined clearly in any documentation as these terms are used with differing meanings in different territories. Adopting terminology commonly used in trading other media in the territory may make OOH audience metrics more easily understood and transferable. However, care must be taken to ensure that if more stringent rules are applied in OOH measurement terms than are applied in other media, those differences are clearly reflected and understood.

Broadly there are four levels to defining an OOH audience volume, but the terms are not universal:

i Circulation - The count of audience in proximity to an OOH frame. Where an audience members precise location or path cannot be determined, or where the detailed mapping of inventory, audience flows and obstructions are not available, circulation allows for some comparison between frames based on how busy a location is. This metric does not account for any ability to actually see the frame and might be seen as the equivalent to 'Served Impressions' in on-line measurement.

ii Opportunity to see (OTS) – The count of audience in front of an OOH frame or defined to be in the area that the frame can be viewed from. Where audience members exact location or path can be determined, and the attributes of the frame are accurately recorded such that a visibility area or viewshed can be determined, an OTS metric can be calculated. As OTS is also referred to as 'Exposure' and often used interchangeably with OTC (below), it important to be clear in the definition used as this metric may not account for the audience's direction of travel.

iii Opportunity to Contact (OTC) – The count of audience in the area that the frame can be viewed from, and where their direction of travel places the frame in their field of view, free of any obstruction. This metric may alternatively be referred to as Realistic Opportunity to see (ROTS), Opportunity to see (OTS) or Impression, so again it is important to be clear

in the definition used. This metric does not account for any probability to see the ad message during the time in contact with the frame. OTC may be seen as the equivalent to 'Viewable Impressions' in on-line advertising or as having been recorded to have been 'in the room' whilst a TV or audio advertisement has played.

iv Visually Adjusted Contact (VAC) – The count of audience in the area that the frame can be viewed from, and where their direction of travel places the frame in their field of view, free of any obstruction, and has a calculation to determine whether the audience has a likelihood to see the advertising message. Most often calculated by applying a probabilistic model based on visibility research to determine what proportion of those with an Opportunity to Contact, will actually look at the OOH frame whilst the ad content is playing. This metric may also be referred to as an Impact; Likelihood to See (LTS); Visibility Adjusted Impact (VAI); and has been described as 'Eyes on Impressions'. VAC may be seen as the equivalent to 'Viewed Impressions' in on-line measurement or 'Audience Impressions' in attention-based media metrics.

4.2. Demographic Parameters:

Demographic subsets should be tailored to mirror those used locally by other media to allow for cross media comparisons and for 3rd party fusions with other media audience measurement data. However, consideration should be made, where the confidence exists in the data, to allow advertisers to measure OOH delivery against combinations of:-

- Gender (Male; Female; Non declared)
- Age range (15-17; 18-24; 25-34; 35-44; 45-49; 50-54; 55-64; 65+)
- Household Income / Social Class / Professional Status
- Ethnicity
- Geography (State, Region, Major City, Postal/Zip code)

It is important to segment audience delivery only where the granularity of the data allows it. Segmentation in reporting where it cannot be robustly justified, can produce unrealistic results and undermine the credibility of the overall OOH measurement project.

4.3. A Glossary of OOH Terms:

Term	Description
Accelerometer	An electronic device that helps us to understand respondent movement by measuring vibrations (relative accelerations).
Ad Audience	The number of individuals estimated to be in the Display Audience while ad content is present and deemed viewable
Ad Campaign	A series of Ad Units delivered for an advertiser during a defined period of time

Ad Exposure Time	The length of time the audience spent viewing when ad content is present and deemed viewable
Ad Rotation Duration	The number of seconds required to view all of the ads in a rotation or Loop. (Note: this applies to situations in which an ad rotation or a Loop exists, and neither of these elements are required.)
Ad Segment	The portion of the Loop, or some other defined period of time, containing advertising content
Ad server	An ad server is a web server dedicated to the delivery of advertisements. This specialisation enables the tracking and management of advertising related metrics.
Ad Unit	Relates to Frame or Spot
Ad Unit Length	See Spot Length
Ad unit orientation	The proportions of an OOH frame - referred to as either Landscape or Portrait
Advertiser Market (Trading Area)	A custom market (often a group of counties) defined by an advertiser or buying agency
Advertising spot	See Spot
Affinity	Measures the suitability of an advertising vehicle for a specific target group: The higher the affinity, the lower the scatter loss
Affinity Index	Reach within target group divided by reach in the underlying universe multiplied by 100 (the higher the index, the greater the affinity)
Angled	When a poster frame is angled to oncoming traffic or pedestrian flow.
Approach	See Maximum Visibility Distance
Aspect ratio	The dimensions of a display screen's image expressed as a ratio of the horizontal width to the vertical height.
Audience	The number of individuals counted as having consumed media., Audiences can be segregated based on demographic or other characteristics for reporting purposes as well as dayparts and/or week-parts
Audience Delivery	The size of an audience that notices Out of Home advertising
Audience impression	See Visibility Adjusted Contacts (VAC)
Automated guaranteed	A programmatic ad transaction that most closely mirrors a traditional digital direct sale. The deal is negotiated directly between buyer and seller, the inventory and pricing are guaranteed
Behavioural profiles	Profile based on past-observed behaviour
Billboards	Stationary inventory outdoor whose audience moves by those locations on a trip to a destination. Billboard audiences are primarily within moving vehicles, but also include some pedestrians.

Campaign Delivery	The audience delivered by an Out of Home advertising campaign
Circulation	Audience count in proximity to an OOH frame
Cone of vision	The field of view for an individual. Also known as the area of sight. It, typically, extends from the subject as (typically) a 120° cone
Contact	See Realistic Opportunity to See (ROTS)
Content	Editorial material displayed alongside OOH advertisements
Content management software/system (CMS)	An application used to create, schedule, manage and modify digital content
Content Segment	The portion of the Loop, or some other defined period of time, containing program or non-advertising content
Copy	The advertising displayed on an outdoor frame
Copy area	The viewing area on an OOH frame
Cost per Play (CPP)	The cost (price) to deliver an ad play on a screen
Cost per Ratings Point (CPRP)	The cost of advertising exposure opportunities that equals one Gross Rating Point (GRP)
Cost Per Thousand (CPM)	The cost for delivering 1,000 Impacts or Impressions
Cost per Thousand (CPT)	See Cost Per Thousand (CPM)
Coverage	The number of individuals delivered by an advertising campaign or network of frames
Cycle	See Display Period
Data Management Platform (DMP)	A piece of software that collects, stores, manages data about users for the purposes of profiling, analysing and targeting an audience
Day Part	A set period of time or proportion of a day to define audience delivery
Deal ID	Also known as a 'deal identifier', is the unique number assigned to an automated ad buy.
Delivered play	The number of times a creative (with a defined spot length) plays fully
Demand Side Platform (DSP)	A piece of software used to purchase advertising in an automated fashion (programmatic).
Demographic Audiences	Audience breakdowns based on various characteristics such as age, sex, income, education, etc.
Digital Out Of Home Media (DOOH)	Any Out of Home display that can change its advertising content remotely - generally LCD or LED screens
Display	See Frame
Display Exposure Zone	See Visibility Area
Display Period	The interval of time when an outdoor advertising frame or campaign is run
Duration	See Dwell Time

Dwell Time	The time spent by an audience member in the visibility area of an OOH Frame
Dynamic OOH	An OOH frame that shows more than one advertising message
Eccentricity	The angle of viewing between the audience and the face at a specific distance
Environment	The place and location of the advertising network and screens
Exposure	See Opportunity to See (OTS)
Eye tracking	A survey methodology that records the movement of the eye and its fixations in relation to what an individual is looking at
Face	The number of advertisements shown individually on a frame
Facing	The direction a Frame is pointing - may be relative to audience flow or to true north (Azimuth)
Flight	See Display Period
Format	Refers to the type of OOH media
Frame	The surface area on an outdoor unit where advertising copy is displayed
Frequency	The average number of times an individual notices an out of home advertising message during a defined period of time
Frequency distribution	Distribution showing the percentage of the target audience population who have viewed a schedule of faces at each level of frequency.
Gap length	The time gap between spots of the same advertiser
Geofencing	A technology that allows an advertiser to select a geographic point using latitude and longitude information and then to create a radius, or virtual “fence” around that point to deliver a digital communication to a particular audience.
Global Positioning System (GPS)	The satellite navigation system that provides precise location information for electronic devices,
Gross Impressions	The number of individuals over a period of time with presence in the defined Exposure Zone, may be also defined as OTS or ROTS
Gross Rating Points (GRPs)	The total number of impacts delivered by an Out of Home schedule expressed as a percentage of total market population
Head-on	When a poster frame is facing oncoming traffic or pedestrian flow.
Impact	See Visibility Adjusted Contacts (VAC)

Impression	A term that varies by market and can refer to Opportunity to see (OTS), Opportunity to Contact (OTC) or Visibility Adjusted Contacts (VAC)
Impression multiplier	The multiplier is an OOH specific metric which informs the buyer exactly how many impacts are delivered in a single ad play
In-Charge	See Posting Date
Internal	Frames that have no external viewing opportunity are classified as internal
Likelihood-To-See (LTS)	See Visibility Adjusted Contacts (VAC)
Line of sight	The simultaneous viewing of more than one OOH unit.
Location Traffic	See Circulation
Loop	Segments of content and advertising programmed to a specific length that repeats on standard intervals
Maximum visibility distance	The distance measured along the line of travel from the point where an advertising unit first becomes fully visible to the point where the copy is no deemed viewable
Media Agency	A company that provides advice to companies on how and where to advertise, and to negotiate costs on behalf of an advertiser.
Media Owner	Individuals, groups or business entities that own a medium of mass communication
Media plan	A plan for an advertising campaign that specifies details of the selected media, advertising content, dates and delivery goals
Mode	See Travel Mode
Occupancy factor	The average occupancy of a vehicle. Generally defined as adults and often derived from governmental or transport authority statistics
Offset	In relation to 'straight ahead' the OFFSET is the angle away from this path at which the poster is located. (see also Eccentricity)
OOH Specialist Agency	A company that provides advice to companies on how and where to advertise using OOH, and to negotiate costs on behalf of an advertiser.
Open auction	A way to buy/sell programmatic advertising. It is the least-restrictive type of ad auction, with a media owner/publisher generally allowing any and all buyers to participate
OpenRTB	The IAB standard for Real Time Bidding (RTB) now used by most DSPs
Operating hours	The period of time each day the frame location is displaying advertising and content to audiences
Operator	See Media Owner
Opportunity to Contact (OTC)	See ROTS

Opportunity to See (OTS)	The number of individuals over a period of time with presence in the defined Visibility Area
Orientation	The direction a Frame is pointing - relative to true north (Azimuth)
Out of Home Media (OOH)	All media formats specifically intended to reach consumers outside the home
Panel	See Frame
Parallel	When a poster frame is parallel to a particular flow of traffic or pedestrian flow.
Participant	See Respondent
Passive	Describes research fieldwork that requires minimal input from the participant. At a practical level the data is simple to process and subject to fewer input errors than in active or survey-based methods
Performance	Evaluation of a campaign's achievements after the event
Place-Based	Located at a destination venue (indoors or outdoors) with associated dwell time. Place-based media audiences are typically pedestrians, or can be individuals located within a venue.
Plant	A media company's entire outdoor advertising inventory
Plant operator	See Media Owner
Point of Purchase	See POS
Point Of Sale (POS)	The time and place that a customer executes the payment for goods and services
Population	The total potential audience available to be measured - population can be segregated based on demographic or other characteristics for reporting
Poster specialist	See OOH Specialist Agency
Posting Date	The date when an advertising billboard is set up or digital LED screen display program is scheduled to commence
Private marketplace	A way to buy/sell programmatic advertising. This auction type is very similar to an open auction, except a publisher restricts participation to select buyers/advertisers
Programmatic	A trading technique applying automation in the buying and selling of media, often using data to value the media bought.
Reach	The percentage of a target audience who notice an advertising message at least once
Real time bidding (RTB)	An automated auction process in which multiple buyers can bid in real time for available digital ad inventory
Realistic Opportunity to See (ROTS)	The number of individuals in the defined Visibility Area, facing the advertising Frame whilst the advertisement is displayed
Respondent	A respondent is a participant in a research study.
Return on Investment (ROI)	The value of increased sales or other measured outcomes over the cost of achieving those outcomes

Rotation	The process of moving the advertiser's message from one location to another at stated intervals to achieve a more balanced coverage of a market
Share of time (SOT)	A percentage share of time on a Dynamic frame that has been used by an advertiser
Share Of Voice (SOV)	A percentage share of a defined market that has been used in an advertising campaign
Sign	See Frame
Site classification	Each advertising frame needs to be classified according to its location, format, size and other specific characteristics
Splay	See Angled
Spot	A piece of advertising creative content
Spot length	The amount of time the advertiser has to play their creative in
Start date	See Posting Date
Street furniture	Advertising displays, many that support the provision of a public amenity, positioned at close proximity to pedestrians for eye-level viewing or at a curb side to impact vehicular traffic
Supply Side Platform (SSP)	A piece of software used to sell advertising in an automated fashion (programmatic).
Target Audience	The audience defined by the advertiser to most closely fit their desired consumers
Target Rating Point (TRP)	The total number of impacts delivered by an Out of Home schedule against a specified target audience group expressed as a percentage of the population of that target group
Traffic Count	The measured number of vehicles (including their occupancy rate) and/or pedestrians passing a given point
Transit	Outdoor and indoor inventory affixed to moving vehicles or positioned at transport hubs.
Transit Advertising	OOH advertising appearing on the exterior or interior of public transportation vehicles or stations
Transition	The change from one message to another on a Dynamic OOH frame
Travel Mode	The mode of travel used by people when passing advertising units
Vendor	See Media Owner
Venue	The place and location of the advertising network and displays
Venue Traffic	The total number of individuals estimated to be present in the venue
View	See VAC
Viewable Impressions	See ROTS

Viewed Impressions	See VAC
Viewshed	See Visibility Area
Visibility Adjusted Contacts (VAC)	The number of individuals in the defined Visibility Area, facing the advertising Frame whilst the advertisement is displayed, adjusted for the probability that they have looked at that ad content
Visually Adjusted Contacts (VAC)	See Visibility Adjusted Contacts (VAC)
Visibility Adjusted Impacts (VAI)	See VAC
Visibility Adjustment (VA)	A ratio or the percentage of a frame's total OTS audience who are likely to notice an ad (VAC)
Visibility Adjustment Index (VAI)	See VA
Visibility Area	The area from which an OOH frame can be viewed without defined obstruction
Visibility Index Score (VI)	See VA
Wastage	The proportion of an advertising campaign's expenditure or advertising weight which is not seen or heard by the specified target audience.
Zone of Visibility	See Visibility Area

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Additional Documentation:

ESOMAR – Global Guidelines on Out-of-Home Audience Measurement https://www.worldooh.org/slider/Global-Guidelines-on-Out-of-Home-Audience-Measurement.pdf

AM4DOOH – Audience Measurement for Digital Out of Home https://www.worldooh.org/members/legislation/258/AM4DOOH%20Whitepaper.pdf

Route – a methodological review https://static1.squarespace.com/static/6131e11f6422a9503c98aad4/t/6138dd896866c938e3f81ecf/1631116705931/ROUTE-A+Methodological+Overview-April+20-V1%5B1%5D.pdf

Route Visibility paper – Pedestrians https://static1.squarespace.com/static/6131e11f6422a9503c98aad4/t/6149efde4dce8766dd93d168/1632235489888/route-report-peds-final.pdf

Route Visibility paper – Drivers and passengers https://static1.squarespace.com/static/6131e11f6422a9503c98aad4/t/6149efd4451d2513465d49c9/1632235478187/route-poster-panel-visibility-for-drivers-and-passengers-a-first-look.pdf

Route Visibility paper – Dynamic Scenes https://static1.squarespace.com/static/6131e11f6422a9503c98aad4/t/6149efe84dce8766dd93d1c9/1632235503232/route-visibility-dynamic-scenes-report.pdf

POSTAR - Visibility Research https://static1.squarespace.com/static/6131e11f6422a9503c98aad4/t/6149eff8c289723cc63972b2/1632235514954/Visibility+Research+-+Visibility+Hit+Rates+for+Poster+Panels.pdf

Swiss Poster Research Ltd - Organization, Studies, Model, Planning Tool https://www.worldooh.org/members/legislation/53/SPR%20-20Swiss%20Poster%20Research%20Ltd.pdf

COMMB – Driving Innovation in OOH https://www.worldooh.org/members/legislation/8/COMMB_NewMeasurement_v1.1.pdf

WORLD OUT OF HOME ORGANIZATION

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