

Programmatic Digital Out of Home

Technical Specifications

Version	1.0
Date	July 6th, 2017
Contact	Frank Goldberg Digital Media Institute Maximilianstr. 13 80539 München frank.goldberg@dmi-org.com

Table of Contents

1.	The DMI Standards for Programmatic Digital Out of Home.....	4
2.	Existing methodology	4
3.	Digital Out of Home specific parameters	4
4.	Process flow	7
5.	DMI & DPAA Programmatic Specs	7
6.	DMI & DPAA DOOH Extensions	8
a.	Object BidRequest (3.2.1)	8
b.	Object Imp (3.2.2).....	10
c.	Object Banner (3.2.3)	10
d.	Object Video (3.2.4).....	11
e.	Object Audio (3.2.5).....	11
f.	Object Native (3.2.6).....	11
g.	Object Format (3.2.7)	11
h.	Object Site (3.2.8).....	11
i.	Object App (3.2.9)	11
j.	Object Publisher (3.2.10).....	11
k.	Object Content (3.2.11)	11
l.	Object Producer (3.2.12)	12
m.	Object Device (3.2.13).....	12
n.	Object Geo (3.2.14)	12
o.	Object User (3.2.15)	13
p.	Object Data (3.2.16)	13
q.	Object Segment (3.2.17)	14
r.	Object Reqs (3.2.18)	14
s.	Object PMP (3.2.19)	14
t.	Object Deal (3.2.20)	14
7.	DMI & DPAA DOOH Responses	15

u.	Object Device (4.2.3).....	15
8.	Appendix A: Device Venue.....	16
9.	Appendix B: Age Ranges	18
10.	Appendix C: HHI Ranges	19
11.	Appendix D: Education.....	20
12.	Appendix E: Employment.....	20
13.	Appendix F: Job Description	20
14.	Appendix G: Other.....	21
15.	Appendix H: Exemplary „contactmultiply“ values	23

1. The DMI Standards for Programmatic Digital Out of Home

The following standards have been adapted from technical standards for Programmatic Digital Out of Home (version 0.5) published by the Digital Place Based Advertising Association (DPAA) in January 2017 (<http://dp-aa.org/wp-content/uploads/2017/02/DPAA-Tech-Specs-FINAL-for-Review-2.7.175-1.pdf>).

The DMI standards take into account specific requirements by and available data about the German Digital Out of Home market. In the following document, **deviations** from the DPAA standards are marked **in red**.

The DMI will try to coordinate further development of these standards with other industry associations to arrive at an internationally accepted version.

2. Existing methodology

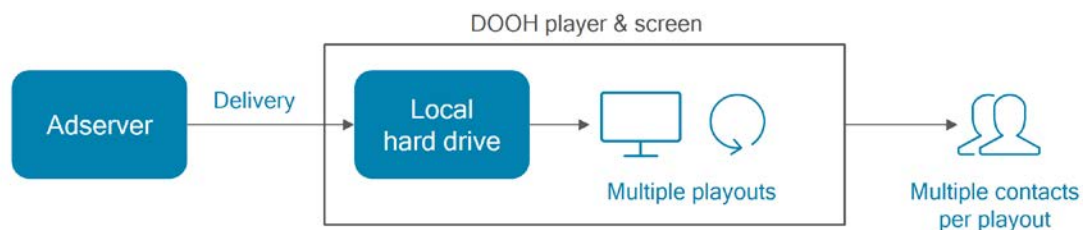
While the needs for digital place-based advertising is unique, these specs will leverage (build-upon) existing protocols. As other standards are already in place covering the basic protocols, these specifications will address the unique needs for place-based. The foundation for these specs in the [Open RTB 2.4 protocols](#).

3. Digital Out of Home specific parameters

There are many unique elements tied to Digital Out of Home advertising that need to be addressed within the programmatic protocols. These include:

- **Impressions vs. deliveries vs. playouts vs. contacts:**
 - **Impressions:** The term „impression“ **should be avoided** when defining reach of DOOH media. „Impression“ is defined as a term for one-to-one media, where delivery of the ad creative, display (or playout) of the ad creative, and contact with (exactly one) target group are treated as the same thing. For one-to-many media such as DOOH, delivery, playout, and contacts have to be treated separately:
 - **Delivery:** A delivery of an ad creative is NOT the saleable item. The delivery only covers the physical transmission of the creative to the DOOH playout system (where it is usually stored on the local hard drive and played out more than once - see below).

- Playout: After delivery an ad creative is usually played out more than once (usually the smallest bookable unit is 1 hour with multiple playouts) on more than one DOOH screen (usually the smallest bookable unit is one location - such as one supermarket or one electronics store - with multiple screens). As such, the „contact“ counts will be adjusted to account for the expected audience (Ex. 10 playouts in 1 hour were viewed by 90 people; therefore, 90 contacts should be recorded). This is a very different consideration to the existing process.
- Measured contacts: In the German market, the reach of DOOH media is measured in „contacts“, not „impressions“. A „contact“ is recorded when a viewer remembers seeing a screen or a creative (utilizing a standardized methodology by DMI & GfK). Together with a „contact“, all demographics of the viewer are recorded. In the future, „contacts“ will be measured or verified using technology such as cameras and/or beacons/ smartphones. Note: Not every person passing a DOOH screen will generate a contact. (In the above example: During the 10 playouts in 1 hour 150 people may have passed the DOOH screen(s), only 90 of which remember having seen the screen or ad creative).

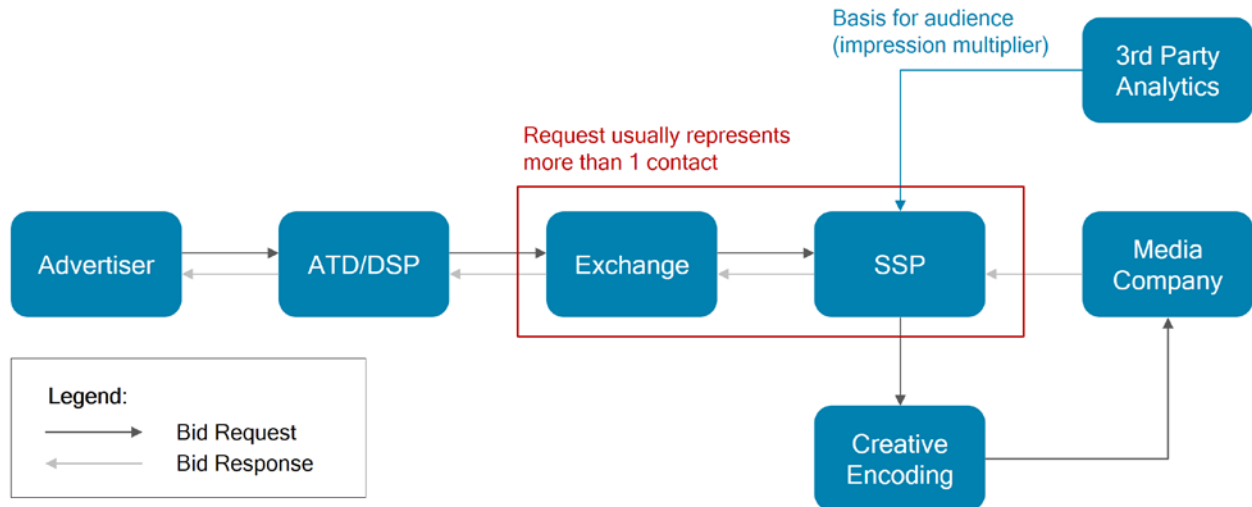


- One-to-many: The audience for Digital Out of Home advertising will generally delivery more than one **contact** (one-to-many) vs the one-to-one impression delivery of traditional programmatic. In some instances this value may be less than 1 (**per playout and screen**) when audience reporting identifies a small audience over a period of time (ex. 45 **contacts** per 60 **playouts** over an hour).
- Decimal value: The basis for the actual number of **contacts** is based on audited statistics provided by analytics providers (e.g. DMI, GfK) which are produced based on weekly, monthly, or yearly summaries. As such, for each ad display a calculation is leveraged which could result in fractional (non-integer) **contact** numbers. The proposed approach is to use decimal values to ensure accuracy (in audience delivery and revenue). The expectation is that the DSP platforms can accept the fractional values and then ultimately present the totals as rounded integer values. If this is later deemed unsupportable, we can alter the standards to be integer based.

- Creative management: There are many unique considerations tied to creatives:
 - Specs: Due to infrastructure and bandwidth access considerations there are unique formats and encoding standards that need to be managed against.
 - Delivery timing: Often times creatives need to be delivered to the platform in advance of the actual **playout**. As such, this transaction may not always be real-time, but instead a “delayed” delivery. Typically, **delivery-to-payout** latency will be thirty mins to two hours, though it can additionally require an overnight process.
 - Creative encoding or adjustments: Creatives will be received by the SSP platform and converted to the necessary formats for delivery to all of the platform’s publisher customers. As such, real-time **playout** will not occur. This needs to be done once for every new creative. As such, the initial creative **playout** will be skipped (to enable conversion) and subsequent **playouts** will be „delivered“.
- Video pixels: Video is traditionally tracked with quartile pixels to verify start through completion. In Digital Out of Home advertising, these values are always 100%.
- Demographics: The audience is a collection of users, not a pre-defined user. As such, additional data elements need to be shared for accuracy.
- Real-time: As there are unique creative requirements the transaction will not be real-time, but instead introduce some latency (a few mins to a few hours) in the delivery from the original bid time.
- Pricing: Pricing will be based on CPM (cost per thousand **contacts**). Each bid request will follow the “One-to-many **contacts**” value. The **contacts** value **will usually be greater than 1** (see **Appendix H for exemplary values**).
- Booking Unit: Most of the time, the smallest sellable (or „bookable“) item will not be a single contact or a single playout (as opposed to a single impression in one-to-one advertising). Rather, the smallest bookable item (of time) is usually 1 hour with several playouts during that hour (generating several contacts with the target group). Some publishers may specify 3 hours as the smallest bookable item (of time), others may specify one full day. The smallest bookable item (of screens) will not be a single screen but a collection of screens - usually one entire location such as one supermarket or one electronics store with multiple screens. A „**booking unit**“ is a collection of bookable screens for a defined number of playouts (usually defined by a unit of time). Each „booking unit“ is assigned a **unique identifier (the „booking unit ID“ or „BUID“)** by the DMI. Information on number and type of screens, playouts, contacts, demographics etc. per booking unit is stored in the [DMI’s DOOHRY database](#), where it can be looked up by SSPs and DSPs using the BUID. Therefore, it is sufficient to pass the BUID between SSPs and DSPs.

4. Process flow

Programmatic Process Flow for Digital Out of Home Inventory:



Note: as the creative is pre-fetched, the initial selection of an ad where the creative has not been processed will be skipped from display (pending encoding and delivery to the platform). Subsequent impression requests will be eligible for delivery (post encoding). A separate platform level creative caching integration between an SSP and DSP can significantly improve this process.

5. DMI & DPAA Programmatic Specs

These programmatic specs for Digital Out of Home advertising are extensions build upon the [DPAA's specs \(version 0.5\)](#) which in turn are build upon the [IAB's OpenRTB API Specifications v2.4 \(Jan 2016\)](#). The IAB standards are the basis for existing connections that advertisers and publishers have with buying platforms. The IAB standards do not adequately support the unique requirements for Digital Out of Home advertising. The OpenRTB framework enables custom extensions to be created to account for variations. The unique Digital Out of Home criteria can be included within these newly developed DMI & DPAA extensions.

6. DMI & DPAA DOOH Extensions

a. Object BidRequest (3.2.1)

The BidRequest contains all of the basics tied to the impression requests. Some modifiers need to exist to account for latency (delayed ad delivery).

Extension: DOOH

Attribute	Description	Type	Status
displaytime	Expected time in epoch seconds UTC the ad will be shown. This is an estimated display time used for day & time targeting.	Int64	Required
advancebid	The number of minutes in advance that the bid will close before the creative is rendered	Int16	Required
buid	"Booking unit identifier": unique identifier in the DMI's DOOHRY database describing the bookable unit in terms of number of DOOH screens, number of playouts and time.	Int64	Required

The „advancebid“ attribute is specific for every network of DOOH screens, i.e. there is a different „advancebid“ value for e.g. a network of supermarket screens or a network of screens in highway rest areas. Within a network of screens, the „advancebid“ attribute represents the **average delay** between the bid request and the first playout of the creative. The „advancebid“ parameter is therefore **not** location-specific or screen-specific but identical for all locations / screens in the same DOOH network. Furthermore, there are no seasonal or time-specific changes to the „advancebid“ attribute, i.e. the value is constant over time. The „advancebid“ value is only changed after changes in the average delay between bid request and first playout (e.g. due to changes in the transmission technology, shortening the transmission latency, or to changes in the program loop length or playout frequency).

It is recommended to pre-load the creative before the start of a campaign (whenever possible), i.e. transmit the creative to all playout systems before the first bid request. This eliminates the transmission latency but leaves the playout latency (resulting from e.g. a fixed playout frequency of a creative in a DOOH programm loop or simply from having to wait for the current playout to finish before being able to execute the bid request).

The „buid“ attribute is the unique „booking unit identifier“ assigned by the publisher in the DMI's [DOOHRY database](#) to a booking unit. A booking unit contains:

- The number of locations (e.g. supermarkets or trains stations) in the Bid Request
- The number of DOOH screens in the Bid Request
- Size, orientation, and resolution of DOOH screens in the Bid Request
- The playout frequency of the creative (e.g. every 2 minutes)
- The number of playouts per screen and day (EBL)
- Playout time (e.g. all day, 8:00-9:00, 9:00-12:00)
- Playout day (e.g. Mondays only, workdays only, weekends only)
- Playout period (e.g. 1 month, 1 week, 1 day)
- Contacts (i.e. measured contacts of target group, not ad impressions) per booking unit
- Demographics (sex, age, HHI, education, employment etc.) per booking unit
- Interests and media usage of target group per booking unit

Booking Units and all of the above information are available through the DMI's DOOHRY database.

The „buid“ attribute is part of the bid request and can be passed on from the SSP to the DSP. The DSP can use the „buid“ to access the above information e.g. via [DOOHRY](#).

b. Object Imp (3.2.2)

As the number of DOOH viewers is usually greater than 1 (multiple contacts per ad delivery), the Impression object will need to account for the actual number of contacts offered with the bid request. The number of contacts will depend on the time and day and the number of locations or screens in the booking unit (see Appendix H for exemplary values).

Extension: DOOH

Attribute	Description	Type	Status
contactmultiply	Adjustment to represent the number of expected contacts (i.e. measured contacts of target group with creative) ContactMultiply is usually greater than 1 and will depend on time of day and on weekday.	Float	Required (see Appendix H for values)

Note:

- **ContactMultiply** is proposed as a non-integer value to reflect the accuracy of the available data and the associated pricing associated with the delivery. The assumption is that the DSPs will aggregate the real numbers (non-integer) values to ultimately present the aggregated delivery totals as integer based values.
- When the „buid“ attribute in Object BidRequest is used (see above), the ContactMultiply attribute is redundant, since the number of contacts is passed on (together with other information) in the „buid“ attribute.

c. Object Banner (3.2.3)

This generally will be used for image (non-video) assets. While the creative sizes will account for the unique specs (else we'll have to add additional modifiers here), the text based resolution will need to be clarified.

Extension: DOOH

Attribute	Description	Type	Status
dpi	This identifies if there is a minimum DPI for any text-based elements of the creative to ensure it is clearly legible and clear on the display	Integer	Required

d. [Object Video \(3.2.4\)](#)

This section is not expected to be utilized as this is not a delivery format utilized.

e. [Object Audio \(3.2.5\)](#)

This section is not expected to be utilized as this is not a delivery format utilized.

f. [Object Native \(3.2.6\)](#)

This section is not expected to be utilized, unless certain creative specs do not account for the unique creative requirements.

g. [Object Format \(3.2.7\)](#)

This section is not expected to be used.

h. [Object Site \(3.2.8\)](#)

This section is not expected to be utilized. The content will be identified as Apps (as opposed to Sites).

i. [Object App \(3.2.9\)](#)

The App name will be used (as opposed to Site) to identify the device. This will be additional to the Publisher record (which might be similar).

j. [Object Publisher \(3.2.10\)](#)

This identifies the media company selling the opportunity and will be used to identify the provider (media company).

k. [Object Content \(3.2.11\)](#)

This section is not expected to be utilized.

I. Object Producer (3.2.12)

This section is not expected to be utilized.

m. Object Device (3.2.13)

The device attributes need to be appended with the device venue to accurately identify the opportunity.

Extension: DOOH

Attribute	Description	Type	Status
devicevenue	This identifies the venue of the console.	Integer	Required. (See Appendix A for valid values)
audio	Identifies whether sound is available for video playback	Integer	Required (0=No sound, 1=sound)

Note:

- When the „buid“ attribute in Object BidRequest is used (see above), the „devicevenue“ and „audio“ attributes are redundant, since the respective information is passed on (together with other information) in the „buid“ attribute.
- The DMI has upgraded the DPAA’s original list of device venues to incorporate all venues with DOOH screens in the German market. At the same time, a hierarchical structure is recommended to be able to group similar venues and to add new venues without having to change the numbering. The proposed structure currently does not match the structure of venues in the DMI’s DOOHRY database (but will in the future). In the future, the DMI and the DPAA structures will be matched in the DOOHRY database as well. (For mapping of all three structures, see Appendix A.)

n. Object Geo (3.2.14)

The Geo object captures the lat/long as well as other attributes necessary. Most of these attributes should be required in the bid request.

o. [Object User \(3.2.15\)](#)

While user attributes (viewer audience in the DOOH context) is critical, it is not user ID specific. As such, the additional audience attributes will be added in 3.2.16 (Data).

p. [Object Data \(3.2.16\)](#)

The Data object is intended to capture additional information about the user. In the DPB perspective the fields will reveal attributes about the expected viewers, not just an individual user.

Every age range will be provided enabling the user to see the volume per segment to meet the buyer's needs.

Extension: DOOH

Attribute	Description	Type	Status
dataprovder	This identifies the source of the audience related data	Integer	Optional (0=DMI, 1=Nielsen, 2=Publisher research, 3=Other)
agerange	This identifies the pre-defined age ranges	Integer	Optional (See Appendix B for values)
agerangepersent	This identifies the percentage of the given age range band to the overall audience enabling buyers to determine percentage of composition of the audience.	Integer	Optional
hhirange	This identifies the pre-defined household income ranges	Integer	Optional (See Appendix C for values)
hhipersent	This identifies the percentage of the given household income range to the	Integer	Optional

Note:

- When the „buid“ attribute in Object BidRequest is used (see above), the „agerange“, „agerangepersent“, „hhirange“, and „hhipersent“ attributes are redundant, since the respective information is passed on (together with more demographic information, see Appendices D to G) in the „buid“ attribute.

- The Age Ranges for programmatic DOOH in the German market should reflect the standards already adopted in the German market which deviate slightly from the DPAA's standards (see Appendix B).
- The Household Income Ranges for programmatic DOOH in the German market should reflect the standards already adopted in the German market which are given as monthly income (in Euros) as opposed to yearly income (in dollars) (see Appendix C).
-

q. [Object Segment \(3.2.17\)](#)

This section is not expected to be utilized uniquely.

r. [Object Reqs \(3.2.18\)](#)

This section is not expected to be utilized uniquely.

s. [Object PMP \(3.2.19\)](#)

This section is not expected to be utilized uniquely.

t. [Object Deal \(3.2.20\)](#)

This section is not expected to be utilized uniquely.

7. DMI & DPAA DOOH Responses

u. Object Device (4.2.3)

The device attributes need to be appended with the device location descriptor to accurately identify the opportunity.

Extension: DOOH

Attribute	Description	Type	Status
contactmultiply	This confirms the impression multiplier at the time of delivery	Integer	Required

Note: this value is to confirm that corresponding **contact** value. While this value was in the bid request, it is confirmed in the bid response in case the timing of the actual creative **playout** (due to latency) delivered in a different time slot where the audience value can be different.

Example: at 8:59 am the audience is expected to be 4 people. At 9:01 the audience is expected to be 11 people. As the **playout** time is not precise, this enables the most accurate value to be delivered in case it was different from the bid request value.

8. Appendix A: Device Venue

DMI	
Name	ID
Transport	1
AIRBORNE	1.1
AIRPORTS	1.2
AIRPORTS_BAGGAGE_CLAIM	1.2.1
AIRPORTS_IN_TERMINAL	1.2.2
AIRPORTS_LOUNGES	1.2.3
AIRPORTS_ARRIVALS	1.2.4
AIRPORTS_DEPARTURES	1.2.5
AIRPORTS_DUTY_FREE	1.2.6
AIRPORTS_GATES	1.2.7
AIRPORTS_PUBLIC_AREAS	1.2.8
AIRPORTS_RESTRICTED_AREAS	1.2.9
HIGHWAYS	1.3
HIGHWAYS_REST_AREAS	1.3.1
HIGHWAYS_ROADSIDE	1.3.2
PUBLIC_TRANSPORT	1.4
RAIL	1.4.1
RAIL_RAILWAY_STATION_ENTRANCES	1.4.1.1
RAIL_RAILWAY_STATION_PLATFORMS	1.4.1.2
RAIL_PASSENGER_TV	1.4.1.3
SUBWAY	1.4.2
SUBWAY_ENTRANCES	1.4.2.1
SUBWAY_PLATFORMS	1.4.2.2
SUBWAY_PASSENGER_TV	1.4.2.3
BUSES & TRAMS	1.4.3
BUSES_TRAMS_SHELTERS	1.4.3.1
BUSES_TRAMS_PASSENGER_TV	1.4.3.2
TAXIS	1.5
TAXIS_IN_CAR	1.5.1
TAXIS_IN_CAR_INTERACTIVE	1.5.2
TAXIS_ROOFTOP	1.5.3
TAXIS_WRAPPED_VEHICLES	1.5.4
PARKING_GARAGES	1.6
TRUCKSIDE	1.7
MARINE	1.8
FERRIES	1.9

Name	ID
RETAIL_POS	2
CONVENIENCE_STORES	2.1
ELECTRONICS_STORES	2.2
ELECTRONICS_STORES_CHECKOUT	2.2.1
ELECTRONICS_STORES_INSTORE	2.2.2
GAS_STATIONS	2.3
KIOSKS	2.4
MALLS	2.5
MALLS_FOOD_COURTS	2.5.1
NEWSSTANDS	2.6
LOTTERY_RETAILER	2.7
POST_OFFICES	2.8
SUPERMARKETS	2.9
SUPERMARKETS_CHECKOUT	2.9.1
SUPERMARKETS_INSTORE	2.9.2
HARDWARE_STORES	2.10
FASHION	2.11
SPORTS	2.12
BAKERIES	2.13
MEAT_FISH	2.14
OPTICIAN	2.15
TOURISM	2.16
CAR_DEALERSHIP	2.17
OTHER	2.18
FINANCIAL_SERVICES	2.19
ATMS	2.20

DPAA	
Name	ID
AIRBORNE	1
AIRPORTS	2
AIRPORTS_BAGGAGE_CLAIM	3
AIRPORTS_IN_TERMINAL	4
AIRPORTS_LOUNGES	5
RAIL	43
SUBWAY	50
BUSES	12
SHELTERS	48
TAXIS_WRAPPED_VEHICLES	51
TRUCKSIDE	52
MARINE	35
FERRIES	24

RETAIL	46
CONVENIENCE_STORES	18
GAS_STATIONS	26
KIOSKS	32
MALLS	33
MALLS_FOOD_COURTS	34
NEWSSTANDS	38
FINANCIAL_SERVICES	25
ATMS	6

DOOHRY	
Kategorie	Oberkategorie
Verkehr/Reisen	
Flughafen	Verkehr/Reisen
Gepäckband	Verkehr/Reisen > Flughafen
Business Bereich	Verkehr/Reisen > Flughafen
Ankunft	Verkehr/Reisen > Flughafen
Abflug	Verkehr/Reisen > Flughafen
Flugsteig	Verkehr/Reisen > Flughafen
Öffentlicher Bereich	Verkehr/Reisen > Flughafen
Sicherheitsbereich	Verkehr/Reisen > Flughafen
Autobahn	Öffentlich
Rasthof	Verkehr/Reisen
Fernbahnhof	Verkehr/Reisen > Bahnhof
U-Bahn / S-Bahn	Verkehr/Reisen > Bahnhof
Bus / Strassenbahn	Verkehr/Reisen > Bahnhof
Taxi	Verkehr/Reisen
Parkhaus	Öffentlich

Stores	Point of Interest
Elektronik	Einkaufen
Tankstellen	Einkaufen
Shopping Malls	Einkaufen
Zeitschriften	Einkaufen
Lotto	Einkaufen
Deutsche Post	Einkaufen
Lebensmittelhandel	Einkaufen
Sport	Einkaufen
Automaten	Geld

DMI

Name	ID
OUTDOOR	3
POSTERS	3.1
JUNIOR_POSTERS	3.2
URBAN_PANELS	3.3
WALLS_SPECTACULARS	3.4
MOBILE_BILLBOARDS	3.5
PHONE_KIOSKS	3.6
CITY_INFORMATION_PANELS	3.7
DEDICATED_WILD_POSTING	3.8
RECEPTACLES	3.9
BACKLIGHTS	3.10
BENCHES	3.11
BIKE_RACKS	3.12
BULLETINS	3.13

Name	ID
Healthcare	4
DOCTORS_OFFICES	4.1
DOCTORS_OFFICES Obstetrics	4.1.1
DOCTORS_OFFICES_PEDIATRICS	4.1.2
DOCTORS_OFFICES_DENTIST	4.1.3
DOCTORS_OFFICES_DENTIST	4.1.4
PHARMACIES	4.2
HOSPITALS	4.3
VETERINARIAN_OFFICES	4.4
PHYSIOTHERAPIST	4.5

Name	ID
EDUCATION_WORKPLACE	5
SCHOOLS	5.1
UNIVERSITY	5.2
UNIVERSITY_LIBRARIES	5.2.1
UNIVERSITY_BIOCENTERS	5.2.2
UNIVERSITY_LOBBY	5.2.3
UNIVERSITY_AUDITORIUM	5.2.4
UNIVERSITY_CANTEEN	5.2.5
UNIVERSITY_GYM	5.2.6
TECHNICAL_COLLEGES	5.3
CHILD_CARE	5.4
OFFICE_BUILDINGS	5.5
MILITARY	5.6

Name	ID
ENTERTAINMENT_LEISURE	6
HOSPITALITY	6.1
HOSPITALITY_BARS_CLUBS_DISCOS	6.1.1
HOSPITALITY_CAFES	6.1.2
HOSPITALITY_RESTAURANTS	6.1.3
HOSPITALITY_CASUAL_DINING_RESTAURANTS	6.1.3.1
HOSPITALITY_QUICK_SERVICE_RESTAURANTS	6.1.3.2
HOSPITALITY_HIGH_END_RESTAURANTS	6.1.3.3
HOSPITALITY_HOTELS	6.1.4
MOVIE_THEATER	6.2
MOVIE_THEATER_CINEMA	6.2.1
MOVIE_THEATER_LOBBIES	6.2.2
THEATER_OPERA_MUSICAL	6.3
SPORTS	6.4
SPORTS_GOLF_COURSES	6.4.1
SPORTS_GYMS	6.4.2
SPORTS_SWIMMING	6.4.3
SPORTS_ARENAS	6.4.4
RESORTS_LEISURE	6.5
SALONS	6.6
TANNING_STUDIOS	6.7
FAMILY_ENTERTAINMENT	6.8
NIGHTLIFE	6.9

DPAA

Name	ID
POSTERS	41
JUNIOR_POSTERS	31
URBAN_PANELS	54
WALLS_SPECTACULARS	56
MOBILE_BILLBOARDS	36
PHONE_KIOSKS	40
CITY_INFORMATION_PANELS	17
DEDICATED_WILD_POSTING	19
RECEPTACLES	44
BACKLIGHTS	7
BENCHES	9
BIKE_RACKS	10
BULLETINS	11

DOCTORS_OFFICES	20
DOCTORS_OFFICES Obstetrics	21
DOCTORS_OFFICES_PEDIATRICS	22

HOSPITALS	29
VETERINARIAN_OFFICES	55

UNIVERSITIES	53
CHILD_CARE	15
OFFICE_BUILDINGS	39

BARS	8
CAFES	13
CASUAL_DINING_RESTAURANTS	14
QSR	42
HOTELS	30
CINEMA	16
MOVIE_THEATER_LOBBIES	37
GOLF_COURSES	27
GYMS	28
SPORTS_ARENAS	49
RESORTS_LEISURE	45
SALONS	47
FAMILY_ENTERTAINMENT	23

DOOHRY

Kategorie	Oberkategorie
Strasse	Öffentlich

Wartezimmer	Point of Interest
Apotheken	Einkaufen
Krankenhaus	Öffentlich

Bildungseinrichtungen	Bildungseinrichtungen
Schulen	Bildungseinrichtungen
Universität	Bildungseinrichtungen
Bibliothek	Gebäude
Biozentrum	Gebäude
Foyer	Gebäude
Hörsaal	Gebäude
Mensa	Gebäude
Sporthalle	Gebäude
(Fach-)Hochschule	Bildungseinrichtungen
Bundeswehr	Bildungseinrichtungen

Freizeit/Leisure	Freizeit/Leisure
Bar/Bistro/Club/Disco	Gastro/Szene
Restaurants	Gastro/Szene
Fastfood	Gastro/Szene
Premium-Gastronomie	Gastro/Szene
Hotel	Urlaub
Kino	Freizeit/Leisure
Theater/Oper/Bühne	Freizeit/Leisure
Sport	Freizeit/Leisure
Schwimmen	Freizeit/Leisure
Friseur	Beauty
Sonnenstudios	Beauty
Nightlife	Freizeit/Leisure

9. Appendix B: Age Ranges

DPAA		
ID#	Gender	Age Range
1	Female	All
2	Female	15-17
3	Female	18-24
4	Female	25-34
5	Female	35-44
6	Female	45-49
7	Female	50-54
8	Female	55-64
9	Female	65+
10	Male	All
11	Male	15-17
12	Male	18-24
13	Male	25-34
14	Male	35-44
15	Male	45-49
16	Male	50-54
17	Male	55-64
18	Male	65+
19	Persons	15-17
20	Persons	18-24
21	Persons	25-34
22	Persons	35-44
23	Persons	45-49
24	Persons	50-54
25	Persons	55-64
26	Persons	65+

DMI		
ID#	Gender	Age Range
1	Female	All
2	Female	14-19
3	Female	20-24
4	Female	25-34
5	Female	35-44
6	Female	45-49
7	Female	50-54
8	Female	55-64
9	Female	65+
10	Male	All
11	Male	14-19
12	Male	20-24
13	Male	25-34
14	Male	35-44
15	Male	45-49
16	Male	50-54
17	Male	55-64
18	Male	65+
19	Persons	14-19
20	Persons	20-24
21	Persons	25-34
22	Persons	35-44
23	Persons	45-49
24	Persons	50-54
25	Persons	55-64
26	Persons	65+
27	Persons	All
28	Female	18-19
29	Male	18-19
30	Persons	18-19

10. Appendix C: HHI Ranges

DPAA	
ID#	HHI Range (yearly)
1	0 - \$24,999
2	\$25,000 - \$39,999
3	\$40,000 - \$59,999
4	\$60,000 - \$74,999
5	\$75,000 - \$99,999
6	\$100,000+

DMI	
ID#	HHI Range (monthly)
1	0 - €999
2	€1,000 - €1,499
3	€1,500 - €1,999
4	€2,000 - €2,499
5	€2,500 - €2,999
6	€3,000 - €3,499
7	€3,500 - €3,999
8	€4,000 - €4,499
9	€4,500 - €4,999
10	€5,000+

11. Appendix D: Education

ID#	Education
1	Volksschule/Hauptschule ohne abgeschlossene Lehre
2	Volksschule/Hauptschule mit abgeschlossener Lehre
3	Weiterführende Schule ohne Abitur
4	Abitur
5	Studium
6	kein Abschluss

12. Appendix E: Employment

ID#	Employment
1	berufstätig
2	voll berufstätig
3	teil-berufstätig (halbtags/stundenweise)
4	In Ausbildung (Schüler, Student, Azubi)
5	in Berufs-Ausbildung, Azubi
6	Hausfrau ohne Berufstätigkeit
7	Schüler(in)
8	Student(in)
9	Rentner(in)
10	nicht berufstätig, arbeitslos

13. Appendix F: Job Description

ID#	Job description
1	Selbständig
2	freiberuflich tätig
3	Angestellter
4	Beamter
5	selbständiger Landwirt
6	Facharbeiter
7	Arbeiter
8	noch nie berufstätig gewesen
9	Hausfrau/-mann ohne Berufstätigkeit
10	In Ausbildung (Schüler, Student, Azubi)
11	nicht berufstätig/keine Angabe

14. Appendix G: Other

ID#	Head of Household
1	ja
2	nein

ID#	Persons in Household
1	1 Person
2	2 Personen
3	3 Personen
4	4 Personen
5	5 Personen oder mehr

ID#	Children
1	Kein Kind
2	1 Kind
3	2 Kinder
4	3 Kinder oder mehr

ID#	Age of Children
1	bis 2 Jahre
2	2 bis 6 Jahre
3	6 bis 10 Jahre
4	10 bis 13 Jahre
5	Keine Kinder im Haushalt

ID#	Decision Maker
1	ja
2	nein

ID#	Management Level
1	Gesamtleitung
2	Teilbereichsleitung
3	Keine leitende Funktion

ID#	Decision Making Authority
1	Treffe Entscheidung über Etat & Finanzierungsmöglichkeiten
2	Treffe Kaufentscheidung zu einem konkreten Angebot oder Produkt
3	Treffe Entscheidungen in Personalfragen
4	Treffe P+O-Entscheidungen
5	Keine leitende Funktion

ID#	Number of Employees in Company
1	Unter 10 Mitarbeiter
2	10 bis unter 50 Mitarbeiter
3	50 bis unter 250 Mitarbeiter
4	250 bis unter 500 Mitarbeiter
5	500 bis unter 1.000 Mitarbeiter
6	1.000 Mitarbeiter oder mehr

15. Appendix H: Exemplary „contactmultiply“ values

Venue	Booking Unit (time)	Days per Booking Unit	Playouts per day	Playouts per Booking Unit	Locations	Screens	Booking Unit (geography)		
							Measured contacts (ContactMultiply) entire Network (all Screens)	Measured contacts (ContactMultiply) per Location	Measured contacts (ContactMultiply) per Screen
Airport	Mo-Su all day	7	360	2.520	7	948	20.137.000	2.876.714	21.242
	Mo-Fr all day	5	360	1.800	7	948	15.701.000	2.243.000	16.562
	Sa all day	1	360	360	7	948	3.102.000	443.143	3.272
	Su all day	1	360	360	7	948	1.334.000	190.571	1.407
	Mo-Su 06 - 09 h	7	60	420	7	948	4.921.000	703.000	5.191
	Mo-Su 09 - 12 h	7	60	420	7	948	3.866.000	552.286	4.078
	Mo-Su 12 - 15 h	7	60	420	7	948	2.321.000	331.571	2.448
	Mo-Su 15 - 18 h	7	60	420	7	948	2.796.000	399.429	2.949
	Mo-Su 18 - 21 h	7	60	420	7	948	2.991.000	427.286	3.155
	Mo-Su 21 - 24 h	7	60	420	7	948	3.241.000	463.000	3.419
	Mo-Su 00 - 06 h	7	0	0	7	948	0	0	0
	Mo-Fr 06 - 09 h	5	60	300	7	948	3.795.000	542.143	4.003
	Mo-Fr 09 - 12 h	5	60	300	7	948	3.019.000	431.286	3.185
	Mo-Fr 12 - 15 h	5	60	300	7	948	1.596.000	228.000	1.684
	Mo-Fr 15 - 18 h	5	60	300	7	948	2.144.000	306.286	2.262
	Mo-Fr 18 - 21 h	5	60	300	7	948	2.427.000	346.714	2.560
	Mo-Fr 21 - 24 h	5	60	300	7	948	2.720.000	388.571	2.869
	Mo-Fr 00 - 06 h	5	0	0	7	948	0	0	0
	Sa 06 - 09 h	1	60	60	7	948	896.000	128.000	945
	Sa 09 - 12 h	1	60	60	7	948	651.000	93.000	687
	Sa 12 - 15 h	1	60	60	7	948	533.000	76.143	562
	Sa 15 - 18 h	1	60	60	7	948	346.000	49.429	365
	Sa 18 - 21 h	1	60	60	7	948	364.000	52.000	384
	Sa 21 - 24 h	1	60	60	7	948	312.000	44.571	329
	Sa 00 - 06 h	1	0	0	7	948	0	0	0
	Su 06 - 09 h	1	60	60	7	948	231.000	33.000	244
	Su 09 - 12 h	1	60	60	7	948	196.000	28.000	207
	Su 12 - 15 h	1	60	60	7	948	193.000	27.571	204
	Su 15 - 18 h	1	60	60	7	948	306.000	43.714	323
	Su 18 - 21 h	1	60	60	7	948	200.000	28.571	211
Su 21 - 24 h	1	60	60	7	948	209.000	29.857	220	
Su 00 - 06 h	1	0	0	7	948	0	0	0	
Highway	Mo-Su all day	7	720	5.040	360	3.259	13.246.000	36.794	4.064
	Mo-Fr all day	5	720	3.600	360	3.259	9.795.000	27.208	3.006
	Sa all day	1	720	720	360	3.259	2.358.000	6.550	724
	Su all day	1	720	720	360	3.259	1.093.000	3.036	335
	Mo-Su 06 - 09 h	7	90	630	360	3.259	2.046.000	5.683	628
	Mo-Su 09 - 12 h	7	90	630	360	3.259	2.153.000	5.981	661
	Mo-Su 12 - 15 h	7	90	630	360	3.259	2.130.000	5.917	654
	Mo-Su 15 - 18 h	7	90	630	360	3.259	3.084.000	8.567	946
	Mo-Su 18 - 21 h	7	90	630	360	3.259	2.232.000	6.200	685
	Mo-Su 21 - 24 h	7	90	630	360	3.259	885.000	2.458	272
	Mo-Su 00 - 06 h	7	180	1.260	360	3.259	717.000	1.992	220
	Mo-Fr 06 - 09 h	5	90	450	360	3.259	1.687.000	4.686	518
	Mo-Fr 09 - 12 h	5	90	450	360	3.259	1.590.000	4.417	488
	Mo-Fr 12 - 15 h	5	90	450	360	3.259	1.443.000	4.008	443
	Mo-Fr 15 - 18 h	5	90	450	360	3.259	2.373.000	6.592	728
	Mo-Fr 18 - 21 h	5	90	450	360	3.259	1.626.000	4.517	499
	Mo-Fr 21 - 24 h	5	90	450	360	3.259	542.000	1.506	166
	Mo-Fr 00 - 06 h	5	180	900	360	3.259	535.000	1.486	164
	Sa 06 - 09 h	1	90	90	360	3.259	255.000	708	78
	Sa 09 - 12 h	1	90	90	360	3.259	398.000	1.106	122
	Sa 12 - 15 h	1	90	90	360	3.259	514.000	1.428	158
	Sa 15 - 18 h	1	90	90	360	3.259	520.000	1.444	160
	Sa 18 - 21 h	1	90	90	360	3.259	364.000	1.011	112
	Sa 21 - 24 h	1	90	90	360	3.259	217.000	603	67
	Sa 00 - 06 h	1	180	180	360	3.259	90.000	250	28
	Su 06 - 09 h	1	90	90	360	3.259	105.000	292	32
	Su 09 - 12 h	1	90	90	360	3.259	165.000	458	51
	Su 12 - 15 h	1	90	90	360	3.259	173.000	481	53
	Su 15 - 18 h	1	90	90	360	3.259	190.000	528	58
	Su 18 - 21 h	1	90	90	360	3.259	242.000	672	74
Su 21 - 24 h	1	90	90	360	3.259	125.000	347	38	
Su 00 - 06 h	1	180	180	360	3.259	92.000	256	28	
Supermarket	Mo-Su all day	6	300	1.800	430	2.254	2.442.000	5.679	1.083
	Mo-Fr all day	5	300	1.500	430	2.254	1.942.000	4.516	862
	Sa all day	1	300	300	430	2.254	501.000	1.165	222
	Su all day	1	300	300	430	2.254	0	0	0
	Mo-Su 06 - 09 h	6	0	0	430	2.254	181.000	421	80
	Mo-Su 09 - 12 h	6	60	360	430	2.254	909.000	2.114	403
	Mo-Su 12 - 15 h	6	60	360	430	2.254	462.000	1.074	205
	Mo-Su 15 - 18 h	6	60	360	430	2.254	625.000	1.453	277
	Mo-Su 18 - 21 h	6	60	360	430	2.254	265.000	616	118
	Mo-Su 21 - 24 h	6	60	360	430	2.254	0	0	0
	Mo-Su 00 - 06 h	6	0	0	430	2.254	0	0	0
	Mo-Fr 06 - 09 h	5	0	0	430	2.254	142.000	330	63
	Mo-Fr 09 - 12 h	5	60	300	430	2.254	665.000	1.547	295
	Mo-Fr 12 - 15 h	5	60	300	430	2.254	385.000	895	171
	Mo-Fr 15 - 18 h	5	60	300	430	2.254	517.000	1.202	229
	Mo-Fr 18 - 21 h	5	60	300	430	2.254	232.000	540	103
	Mo-Fr 21 - 24 h	5	60	300	430	2.254	0	0	0
	Mo-Fr 00 - 06 h	5	0	0	430	2.254	0	0	0
	Sa 06 - 09 h	1	0	0	430	2.254	39.000	91	17
	Sa 09 - 12 h	1	60	60	430	2.254	243.000	565	108
	Sa 12 - 15 h	1	60	60	430	2.254	77.000	179	34
	Sa 15 - 18 h	1	60	60	430	2.254	108.000	251	48
	Sa 18 - 21 h	1	60	60	430	2.254	33.000	77	15
	Sa 21 - 24 h	1	60	60	430	2.254	0	0	0
Sa 00 - 06 h	1	0	0	430	2.254	0	0	0	