



Outdoor Media Math Formulas

Daily Gross Rating Points:

Daily GRP's = ((# of panels x per panel average DEC)/total market population) x 100

Frequency:

F = ((Target audience weights* x Daily GRP's x days in campaign)/100) + 2 weight factor for posters
4 weight factor for rotaries
6 weight factor for perm bulletins

Reach:

R = (Target audience weights* x Daily GRP's x days in campaign)/Frequency

CPM:

Average CPM for 28 days = (Per panel 4-week cost/(average DEC x 28)) x 1000

*Target Audience Weight for Adults 18+ is 1.00

Reach and Frequency for Multiple Media Formats:

Use this formula when calculating GRP's, reach and frequency for different media—ie: TV and outdoor

To combine the GRP's, reach and frequency for formats X and Y:

$$\text{Combined GRP's} = X \text{ GRP} + Y \text{ GRP}$$

$$\text{Combined Reach} = (X \text{ reach} + Y \text{ reach}) - (.01 \times X \text{ reach} \times Y \text{ reach})$$

$$\text{Combined Frequency} = \text{Combined GRP's} / \text{Combined reach}$$

Reach and Frequency for Multiple Outdoor Formats:

Use this formula when calculating GRP's, reach and frequency when combining different outdoor formats

To combine the GRP's, reach and frequency, use the gallop math models above. The only difference is the weight factor in the frequency formula. The total Combined GRP is divided into the total of the individual GRP level multiplied by the product weight factor.

For example, to find the weight factor for rotary bulletins at a 25 GRP level and posters at a 50 GRP level,

$$(25 \text{ GRP} \times 4 \text{ rotary weight factor}) + (50 \text{ GRP} \times 2 \text{ poster weight factor}) = 200$$

$$\text{Combined GRP Total} = 75\text{GRP} \qquad \text{Weight factor} = 200/75=2.6$$

Use the weight factor of 2.6 in the regular outdoor frequency formula.

Source: Gallop Math Model



Calculating Daily Effective Circulation

Advertising exposure to Outdoor Advertising is called Daily Effective Circulation (DEC). DEC is computed by using factors which calibrate period of exposure, directional traffic and vehicle occupancy. When appropriate, pedestrian traffic is also included.

Non-illuminated displays are allowed 12 hours of exposure, while illuminated displays are allowed 18 to 24 hours depending upon whether the lights are turned off at midnight or daybreak.

All two-way traffic is converted to effective directional traffic and DEC further converts traffic counts to people exposure. The current load factor used for adult 18+ vehicle occupancy is 1.38.

Official counts are generally available from departments of transportation at city, county or state agencies. State counts are taken on most roadways in three-year cycles, while city and other regional agencies provide new data less frequently. Factors used for converting official 24-hour traffic counts to DEC are shown below.

Factors Used to Convert Official 24-Hour Counts to DEC

Period of Exposure	Factor
24 hours	.69
18 hours	.656
12 hours	.46

Derivation of Factors for Official Counts

Period of Exposure	Formula
24-hour =	$100 \times 1.38 / 2 = .69$
18-hour =	$100 \times .95 \times 1.38 / 2 = .656$
12-hour =	$100 \times .66 \times 1.38 / 2 = .46$

.95 = percentage of the total daily traffic that passes in an 18-hour period

.66 = percentage of the total daily traffic that passes in a 12-hour period

Convert 24 hour count of 27,600 to 12-hour DEC

$$27,600 \times .46 = \mathbf{12,696 \text{ DEC}s}$$

Source: Traffic Audit Bureau