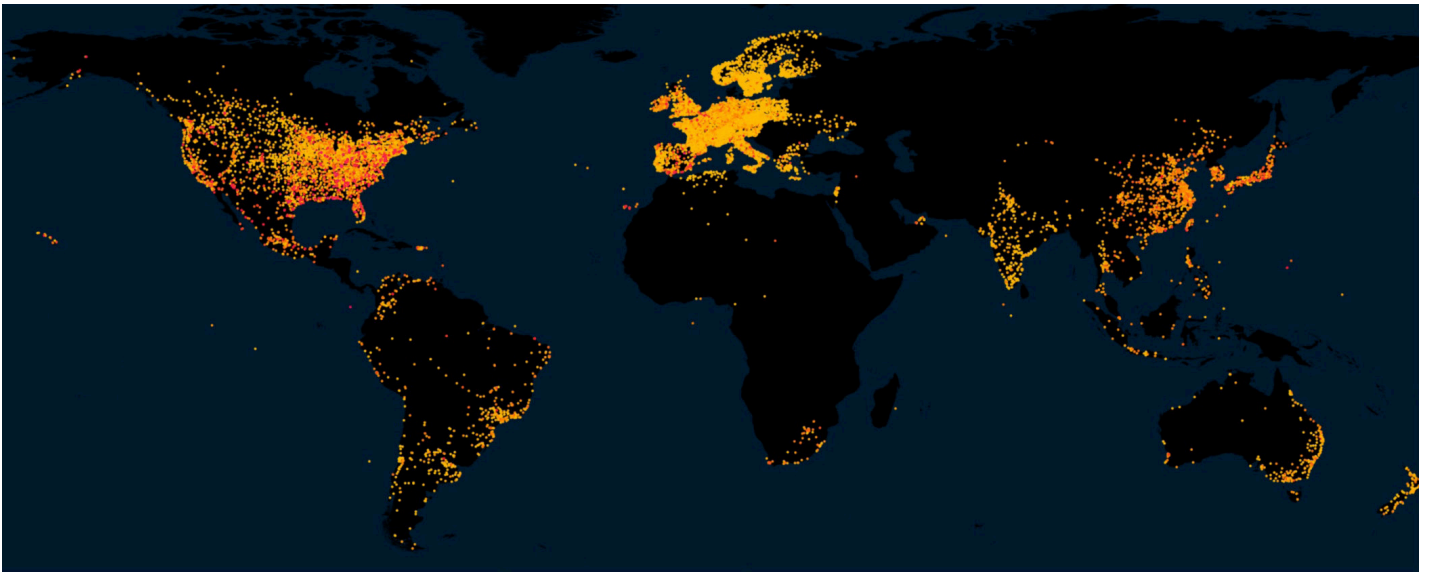# CINEMA CITIES INDEX

The Cinema Cities Index ranks the world's top cities for film lovers.

Using a global dataset of information about cinema venues and showtimes we have ranked the cities of the world for their 'cinemability', their ability to support cinemagoing.

We have collected data for 311 cities with populations in excess of one million, from 48 countries (spanning mainly Europe, North America, South America, Asia, and Australasia). You can see the locations we are tracking in the following map:

The process of determining a 'ranking algorithm' for the cinema cities index was quite detailed. The purpose of this article is to outline our approach to determining key concepts and factors, geographical data, and temporal span.

The 5 Key Concepts of Cinemability:

The Cinema Cities Index is currently based around five main concepts for measuring cinemability:

1. access to venues including a diversity of venue types
2. film variety
3. screening volume
4. the presence of film festivals within the city, and
5. the monetary cost associated with seeing a film

The Cinema Cities website invites the public to participate in producing their own cinemability rankings and based on this activity we will be able to determine which concepts make the most sense to cinema lovers around the world.

Cinema City Index Variables

These five main concepts cover ten variables that are each assigned a specific weighting used to calculate the index. The variables include:

- Number of screens per capita
- Total number of separate movie titles screened
- Number of separate movie titles screened per capita
- Number of screenings per capita
- Total number of screenings
- Number of multiplexes
  (7 or more screens) per capita
- Number of small cinemas
  (1-6 screens) per capita
- Total number of film festivals
- Number of film festivals per capita
- Affordability of a movie ticket relative to average income

These variables were chosen to balance the advantages of larger cities (through their sheer force of size) with the relative performance of smaller cities through the inclusion of measurements based on per capita adjustments.

THE RESULTS – Top Ten Ranked Cities

RANKING	CITY
1	Los Angeles-Long Beach-Santa Ana
2	Paris
3	New York
4	Chicago
5	London
6	Vancouver
7	Brussels
8	Washington, D.C.
9	Berlin
10	San Francisco-Oakland

City Selection Criteria

Cities included in the index were extracted from the kinomatics database. The kinomatics database consists of film screening ('showtime') information for every movie shown in 48 countries over a twelve month period (2013). Therefore, only cities that are in the named 48 countries were considered for inclusion in the index (see http://kinomatics.com/about/data-and-technology/ for a list of the countries included). From these cities, only those with a population of over one million were used for the index (for details on this see section Population). This resulted in a dataset of 311 cities.

The Hobbit Year

The 12 month period of 2013 has been adjusted slightly from a calendar year to what we call the 'Hobbit Year'. The reason why the calendar year hasn't been used as the basis for our research is its evident lack of suitability in accounting for big movie release dates. For many countries the day after Christmas ('Boxing Day') is a critical release date for blockbuster movies. Using a calendar year to determine industry performance means that a critical period for calculating showtimes and revenue is split between two different years (since the lucrative release period between December 26 and January 1 occurs in the previous calendar year). We wanted to remove this division (and therefore the calendar year) from our understanding and analysis of cinema data. However, although starting the adjusted year 2013 on December 26 would have worked well for gathering data about most films, it failed to account for one extraordinary factor: the massive international release of *The Hobbit: An Unexpected Journey*. The sheer weight of anticipation, marketing, international spread, and box office for this film compelled us to manipulate our year so that it incorporated a full, global *Hobbit* release – from December 11 2012 to December 10 2013. This also had the benefit of encompassing other major releases starting on Boxing Day.

Defining Urban Agglomerations

Cities (or UN Urban Agglomerations) were defined in line with the United Nations, Department of Economic and Social Affairs (http://esa.un.org/unup/CD-ROM/Urban-Agglomerations.htm).

To calculate which venues belonged to which cities, the boundaries of each of the urban agglomerations needed to be defined. This presented some difficulty as each cinema venue within the kinomatics dataset did not always consistently include city name. In some instances suburb name instead of city was provided. Furthermore, even where city names were provided these did not always correspond to the UN agglomeration titles.

There is no definitive source of information on the spatial extents of the defined urban agglomerations. Indeed the space a city or urban agglomeration occupies is not a fixed concept over time. Yet, in order to produce a cinema city ranking we needed to spatially define the agglomeration areas as they currently lie. To facilitate the spatial definition of the urban agglomerations, the point location of the cities were used as a basis for analysis (http://esa.un.org/unpd/wup/GIS-Files/gis_1.htm). The following source was used to depict areas of urban concentration: http://www.naturalearthdata.com/downloads/10m-cultural-vectors/10m-urban-area/. This dataset is based on MODIS satellite imagery at a 1km resolution which has been used to depict urbanised areas. Using this dataset, together with the point location of cities and GoogleEarth imagery, each cities urban agglomeration area was defined and drawn. This then formed the basis of determining which cinema venues fell within the spatially defined boundaries of any given urban agglomeration, which in turn forms the basis for all variables tied to a particular city used in the index.

THE RESULTS - Performance of Australian Cities in Top 100

RANKING	CITY
16	Melbourne
37	Sydney
62	Brisbane
82	Adelaide
100	Perth

Population

Population information for each city was calculated using the population of urban agglomerations sourced also from the United Nations. Specifically this data was taken from the UN defined urban agglomerations using the latest available figures from 2010 that exist in spatial form: http://esa.un.org/unpd/wup/GIS-Files/gis_1.htm. On the basis of this data, cities with populations in excess of 1 million inhabitants were identified to form the sample of cities covered by the index. This data is also referenced for the calculation of per capita variables that are included within the index.

Cinema Venue and Movie Showtime Data

The first 7 variables (*Number of screens per capita; Total number of separate movie titles screened; Number of separate movie titles screened per capita; Number of screenings per capita; Total number of screenings; Number of multiplexes per capita; and Number of small cinemas per capita*) are based on data from the kinomatics database (see http://kinomatics.com/) which consists of over 120 million records that describe every film screening in 48 countries over a 12 month period. This dataset includes information on the title of each movie screened, the time and date of each screening, and also the number of screens in each venue.

Film Festivals

For each of the 311 cities covered, further supplementary information deemed to be of relevance in terms of assessing cinemability, was sought. The presence of film festivals linked to a city location was an important feature that needed to be captured to make our index robust and meaningful. Indeed film

festivals are typically tied to a specific location, with the name of the host city frequently featuring in the title of the festival itself, such as the Melbourne International Film Festival. The linking of cities to film festivals is also noted as part of the criteria by UNESCO in guiding cities interested in joining the Creative Cities Network to become officially recognised as a City of Film.

Data on film festivals were sourced from Festival Focus (http://www.festivalfocus.org/breakdown.php) which has a comprehensive listing of film festivals by country. By searching through the records on countries linked to the cities within our dataset a supplementary film festivals database was constructed.

Price Data on the Cost of a Movie Ticket

Price data on the typical or average cost of purchasing a movie ticket, within a particular city was sourced from Expatisan (http://www.expatistan.com/cost-of-living). Expatisan provides a cost of living calculator that allows comparison in the overall cost of living between different cities as well as allowing comparison on common items, which includes the cost of purchasing 2 cinema tickets. The price information collected by Expatisan is based on the volunteered responses of individuals within the stated cities that it covers. All of the cities included within our dataset were also covered by Expatisan which facilitated the collection of this price information, although despite being covered by Expatisan there were still 56 cities (52 of which were Chinese cities) where no specific observation on the price of 2 movie tickets was provided. For these cities that lacked ticket price information, estimates were instead based on the national average ticket prices. The price for 2 movie tickets reported by Expatisan was converted to the unit level and is stated in 2012 USD price equivalents to enable comparison across currencies.

To assess the relative affordability of purchasing a movie ticket across different cities we also needed to account for the different income levels that exist. Unfortunately average income estimates are not readily available at the city level, so instead estimates of national income (or GDP) on a per capita basis is used. These estimates are based on figures sourced from the United Nations National Accounts Main Aggregates Database (http://unstats.un.org/unsd/snaama/dnllist.asp) and are expressed in 2012 USD price equivalents that were converted to a weekly average.

The average cost of a cinema ticket as a percentage of weekly income was then able to be calculated to become the variable: *Importance of affordability of a movie ticket relative to average income*.

Normalising the Data

Each of the variables were normalised to ensure a relatively even distribution and to fit a range of between 0 and 1. This ensured that all variables are evenly weighted and statistically comparable.

Our Weightings

In terms of each of the five concepts used in creating our own index, the following ten variables are taken into account and are assigned a weighting as indicated:

- Number of screens (Total 20%)
  - → *Number of screens per capita*   20%

- Number of separate movie titles screened (Total 18%)
  - → *Total number of separate movie titles screened*   12%
  - → *Number of separate movie titles screened per capita*   6%

- Number of screenings (Total 18%)
  - → *Number of screenings per capita*   12%
  - → *Total number of screenings*   6%

- Number of film festivals (Total 18%)
  - → *Total number of film festivals*   12%
  - → *Number of film festivals per capita*   6%
- Type of movie venue (Total 16%)
  - → *Number of multiplexes (7 or more screens) per capita*   6%
  - → *Number of small cinemas (1-6 screens) per capita*   10%
- Affordability of cinema-going (Total 10%)
  - → *Importance of affordability of a movie ticket relative to income*   10%

The index is calculated using the following **algorithm**:

```
=((Variable1*0.20)+(Variable2*0.12)+(Variable3*0.06)+(Variable4
*0.12)+(Variable5 *0.06)+(Variable6*0.12)+(Variable7*0.06)+(Variable8*
0.06)+(Variable9*0.1)+(Variable10*0.1)*100
```

THE RESULTS - Top 100 Ranked Cities

RANKING	CITY
1	Los Angeles-Long Beach-Santa Ana
2	Paris
3	New York
4	Chicago
5	London
6	Vancouver
7	Brussels
8	Washington, D.C.
9	Berlin
10	San Francisco-Oakland
11	Tokyo
12	Buenos Aires
13	Boston
14	Austin
15	Cologne
16	Melbourne

cinemacities.com

THE RESULTS - Top 100 Ranked Cities (continued)

17	Mexico City
18	Portland
19	Tel Aviv-Jaffa
20	So Paulo
21	Madrid
22	Marseille
23	Barcelona
24	Milan
25	Seattle
26	Miami
27	Santiago
28	Lyon
29	Houston
30	Minneapolis-St. Paul
31	Amsterdam
32	Osaka-Kobe
33	Dallas-Fort Worth
34	Rio de Janeiro
35	West Yorkshire
36	Rome
37	Sydney
38	Atlanta
39	Toronto
40	Munich
41	Zurich
42	Kansas City
43	Manchester
44	Hamburg

cinemacities.com

THE RESULTS - Top 100 Ranked Cities (continued)

45	Lille
46	Dublin
47	Denver-Aurora
48	Caracas
49	Lisbon
50	Philadelphia
51	Phoenix-Mesa
52	Bogota
53	San Diego
54	Detroit
55	Columbus
56	Turin
57	Salt Lake City
58	San Jose
59	Bridgeport-Stamford
60	Glasgow
61	Cleveland
62	Brisbane
63	Seoul
64	Montreal
65	Nagoya
66	Pittsburgh
67	Stockholm
68	Ottawa-Gatineau
69	Birmingham
70	Rotterdam
71	Edmonton
72	Orlando

THE RESULTS - Top 100 Ranked Cities (continued)

73	Lima
74	Haifa
75	Tampa-St. Petersburg
76	Guadalajara
77	Cordoba
78	Fukuoka-Kitakyushu
79	Medellin
80	San Antonio
81	Puebla
82	Adelaide
83	Monterrey
84	Mumbai
85	Riverside-San Bernardino
86	St. Louis
87	Delhi
88	Virginia Beach
89	Hong Kong
90	Baltimore
91	Singapore
92	Charlotte
93	Kyoto
94	Bangalore
95	Sacramento
96	Indianapolis
97	Athens
98	Dubai
99	Auckland
100	Perth

Credits and Questions

Concept and calculations for the Cinema Cities Index by the **Kinomatics Team** (http://kinomatics.com/about/the-team/)

Technical development by **James Verhoeven** (http://www.linkedin.com/in/jamesverhoeven)

Website designed by **Viveka de Costa** (http://www.thecommonroom.com.au/)

Australian Government
Australian Research Council

Any questions, please contact **Alwyn Davidson** at: alwyn.davidson@deakin.edu.au

cinemacities.com