

November 2010

# FIFA World Cup 2018

## An Assessment of Air Transport and Accessibility in the Bidding Countries

### **Methodology: How we computed the Air Accessibility Index for the candidates bidding to host the FIFA World Cup 2018**

To calculate the Air Accessibility Index for each candidate bidding to host the FIFA World Cup 2018, we employed a procedure that can be broken down into five steps. First, all international airports in the candidate countries were identified and subsequently treated as potential access points for foreign visitors to the candidate countries (1). Second, the centrality of the candidate countries' international airports was measured by calculating the inverse of the average distance from each airport to the candidate countries' proposed host cities (2). Third, the number of inbound flights to each international airport was weighted by the estimated participation likelihood of each country that the inbound flights depart from (using two different methods of estimating the likely participants at the World Cup 2018, see note at the bottom of this page) (3). Next, we combined the results of step (2) and (3) above by multiplying the centrality index for each international airport with the weighted number of inbound flights from expected participating countries. The product of (2) and (3) provided us with an air accessibility contribution index for each international airport in the candidate countries (4). Finally, the air accessibility contribution index per airport was summed for all international airports in each of the candidate countries, producing an overall Air Accessibility Index for each bidding country (or combination of two countries in the case of joint bids) (5).

Based on this procedure, the Air Accessibility Index produces higher scores for countries with more international airports, more inbound flights, and shorter distances between proposed host cities. Put differently, the Air Accessibility Index indicates the relative ease with which foreign visitors from likely participating countries can be absorbed with current air transportation capacities and distributed from airports to host cities in the candidate countries.

Our approach required us to predict the likely participants at the FIFA World Cup 2018. To minimize any potential bias from choosing one out of many possible prediction methods, we performed all our calculations for two different sets of predicted participating countries:

- a) WC 2018 participating countries were assumed to be the 32 top-ranked countries by confederation, using the official FIFA ranking as of October 2010.
- b) WC 2018 participation likelihood was weighted by the participation frequency of the 59 countries that participated at the five most recent World Cups (1994-2010).

### Calculation example

The following is a calculation example for England as candidate host country, and using participation prediction method (b) above, i.e. flights from the 59 countries participating at the five most recent World Cups are included and weighted by the participation frequency of each country.

(1.) International airports and (2.) centrality:

Airports		Host Cities (distance from airports in kms)				Results	
Code	Airport	London	Manchester	Birmingham	...	Avg. Distance	Centrality
BHX	Birmingham	163	117	0	...	148.92	0.00672
BLK	Blackpool	325	65	168	...	183.17	0.00546
BOH	Bournemouth	151	310	194	...	268.92	0.00372
BRS	Bristol	171	229	122	...	210.58	0.00475
CWL	Cardiff	213	232	139	...	224.17	0.00446
DSA	Doncaster/Sheffield	236	73	130	...	153.83	0.00650
MME	Durham	376	147	257	...	222.25	0.00450
EXT	Exeter	254	324	226	...	291.17	0.00343
FZO	Filton	170	223	116	...	207.00	0.00483
HUY	Humberside	234	104	150	...	170.08	0.00588
LBA	Leeds/Bradford	274	53	150	...	156.00	0.00641
LPL	Liverpool	289	53	128	...	165.08	0.00606
LON	London	0	264	163	...	227.83	0.00439
LYX	Lydd	94	355	258	...	312.50	0.00320
MAN	Manchester	264	0	117	...	146.25	0.00684
MSE	Manston-Kent	104	341	257	...	306.75	0.00326
NCL	Newcastle	400	170	281	...	239.42	0.00418
NWI	Norwich	159	254	218	...	255.58	0.00391
NQT	Nottingham	178	92	75	...	143.42	0.00697
PLH	Plymouth	307	369	277	...	331.25	0.00302
SOU	Southampton	111	294	178	...	254.00	0.00394

(3.) Inbound flights and weightings:

[illegible]

(4.) Centrality index \* weighted flights = Air Accessibility Index (per airport)

Code	Airport	Centrality	Total weighted flights	Air Access. Index
BHX	Birmingham	0.00672	346.6	2.327
BLK	Blackpool	0.00546	10.0	0.055
BOH	Bournemouth	0.00372	21.6	0.080
BRS	Bristol	0.00475	200.0	0.950
CWL	Cardiff	0.00446	45.4	0.203
DSA	Doncaster/Sheffield	0.00650	19.0	0.124
MME	Durham	0.00450	18.8	0.085
EXT	Exeter	0.00343	18.2	0.063
FZO	Filton	0.00483	2.4	0.012
HUY	Humberside	0.00588	17.2	0.101
LBA	Leeds/Bradford	0.00641	140.8	0.903
LPL	Liverpool	0.00606	194.6	1.179
LON	London	0.00439	4858.6	21.325
LYX	Lydd	0.00320	1.6	0.005
MAN	Manchester	0.00684	578.0	3.952
MSE	Manston-Kent	0.00326	0.6	0.002
NCL	Newcastle	0.00418	149.4	0.624
NWI	Norwich	0.00391	22.8	0.089
NQT	Nottingham	0.00697	138.4	0.965
PLH	Plymouth	0.00302	2.8	0.008
SOU	Southampton	0.00394	48.8	0.192
(5.) Air Accessibility Index per candidate country:				33.243

## Results

Air Accessibility Index for set a) 32 top-ranked countries by confederation:

1. Belgium-Netherlands	30.9
2. England	27.8
3. Portugal-Spain	8.8
4. Russia	1.1

Air Accessibility Index for set b) 59 participants weighted by participation frequency:

1. Belgium-Netherlands	33.6
2. England	33.2
3. Portugal-Spain	11.5
4. Russia	1.1

Air Accessibility Index overall, average of a) and b)

1. Belgium-Netherlands	32.3
2. England	30.5
3. Portugal-Spain	10.2
4. Russia	1.1