

Annexes

Annex 1: table of cities included in the ranking

City	Definition	Country	City area (km ²)	Population
Amsterdam	Municipality	Netherlands	219.0	882,633
Antwerp	Municipality, excluding port area	Belgium	140.3	565,039
Barcelona	Municipality	Spain	100.8	1,636,732
Berlin	Municipality and State	Germany	891.8	3,677,472
Bologna	Municipality	Italy	140.9	390,734
Bratislava	Municipality	Slovakia	367.6	475,503
Bristol	Municipality	United Kingdom	110.0	472,467
Brussels-Capital Region	Region	Belgium	162.4	1,222,637
Bucharest	Municipality	Romania	239.0	2,161,347
Budapest	Municipality	Hungary	1044.9	1,706,851
Cologne	Municipality	Germany	406.7	1,073,096
Copenhagen	Municipality	Denmark	93.6	644,431
Florence	Municipality	Italy	102.3	362,353
Ghent	Municipality	Belgium	157.9	264,666
Hamburg	Municipality and State	Germany	742.5	1,904,000
Helsinki	Municipality	Finland	214.0	658,457
Krakow	Municipality	Poland	326.8	802,583
Lisbon	Municipality	Portugal	84.7	545,923
Ljubljana	Municipality	Slovenia	275.1	294,113
Greater London	Region	United Kingdom	1595.2	8,799,730
Lyon	Municipality	France	48.0	518,635
Madrid	Municipality	Spain	604.9	3,305,408
Manchester	Municipality	United Kingdom	115.6	568,996
Marseille	Municipality	France	242.1	868,277
Milan	Municipality	Italy	181.8	1,374,582
Munich	Municipality	Germany	311.4	1,515,860
Oslo	Municipality	Norway	480.8	702,543
Paris	Municipality	France	105.4	2,175,601
Prague	Municipality	Czech Republic	496.3	1,301,432
Rome	Municipality	Italy	1285.8	2,823,000
Sofia	Municipality	Bulgaria	1339.0	1,248,452
Turin	Municipality	Italy	130.1	858,205
Vienna	Municipality	Austria	414.9	1,914,743
Warsaw	Municipality	Poland	517.2	1,863,056
Wrocław	Municipality	Poland	292.8	673,531
Zaragoza	Municipality	Spain	973.8	686,986

Table 7: Table of cities included in the ranking. Source: Clean Cities

Annex 2: indicators

School streets

Definition of the metric

Share of primary schools within the city area with permanent or time-based school streets limiting motorised traffic at least during drop-off and pick-up times

Additional information

- All public and private schools of primary education age ([ISCED 1](#) as defined by UNESCO). Nurseries and preschools, which in some cities also have been treated with school streets, are therefore not included.
- Private, free, independent schools have been included where figures were available but special education schools have been excluded because education systems differ too much across countries.
- We counted measures that were identified as school streets by the cities and that include permanent or time-base access restrictions for motorised traffic, at least during drop-off and pick-up times.
- Short term trials of less than 12 months, advisory-only and other non-binding schemes have not been included.
- Schemes that exclusively rely on traffic-calming measures have not been included as they do not limit motorised traffic. The same applies to heart zones, more common in Scandinavian countries.
- Other measures restricting motorised traffic (e.g. pedestrianised zones) that have not been created with the explicit aim of limiting motorised traffic around a school are not counted, as are schools that have always had a car-free street.

Uncertainties and limitations

- We counted institutions not sites or buildings - a school might have more than one site or building, but this is overall rare and has thus at worst a limited impact.
- This is a purely quantitative assessment of the numbers of school streets. It does not attempt to be a qualitative judgment on the - often differing - extent, ambition, quality of implementation and effectiveness of school streets across European cities.
- Not all school streets are equal. Generally speaking, the more permanent, pedestrianised, redesigned, and greened, the more play and other uses beyond traffic are encouraged, the bigger the positive impact. However, for the purpose of this indicator, permanently pedestrianised and temporarily closed school streets are not weighted differently.

Safe speeds

Definition of the metric

Share of the total road network that is limited to max. 30km/h (20mph) or less

Additional information

- For this indicator, the entire public road network within the city area has been considered.
- This includes also motorways (see explanation below) and trunk roads, any other public roads not managed by the city authority (province, regional or national roads) and local streets open to the public (excluding private roads and footpaths). Moreover, the road network includes all public roads within the municipality and is not limited to the roads within the built-up area.
- Private roads and footpaths were excluded. However, pedestrian zones and streets were included.
- Only the general legal speed limit has been taken into account (no speed limits for specific vehicle types or in adverse weather or during smog).
- For the UK, speed limits of 20mph or less were used as equivalent to 30km/h.
- The number of lanes or directions on a road does not affect the road network length, .i.e. a road with 3 lanes counts for the same as a single-lane road, a two-way street the same as a one-way street.
- In absence of city data, data from Openstreetmap (OSM) was used, selecting OSM objects with the 'highway' key and the following values:
 - 'motorway','trunk', 'primary', 'secondary', 'tertiary', 'motorway_link', 'trunk_link', 'primary_link', 'secondary_link', 'tertiary_link', 'residential', 'unclassified', 'living_street'

Uncertainties and limitations

- Cities' exact definitions or methods to count the length of their road network might differ.
- Some cities might have only provided the length of the road network with recorded maximum speed, which might have excluded non-motorised roads (e.g. pedestrian streets).
- In some cases, estimates from either city administrations, other government departments or Openstreetmap (in order of preference) had to be used as the city was not able to provide the exact figure.
- The distribution of road types and the legal power cities have over them differs from country to country and affects the share of roads cities can limit to 30km/h.
- A high proportion of rural/not built-up areas within municipalities affects the share of roads with speed limits of 30km/h or less negatively.
- A number of road types should and could likely not be limited to 30km/h, such as motorways or trunk roads. Due to technical limitations and the lack of harmonized road network data across countries, it was not possible to exclude them from the analysis. However, those usually account for not more than 15% of any city's road network

Protected cycling infrastructure

Definition of the metric

Ratio of length of protected cycling infrastructure versus length of road network (in km)

Additional information

- Protected cycling infrastructure is defined as any cycling infrastructure that is physically segregated (by a barrier, height difference or distance) and thus provides protection from motorised traffic, increasing actual and perceived safety.
- This includes cycle tracks but also shared foot and bike paths, pedestrian streets or greenways. It doesn't include cycle lanes that are painted on the road, nor [cycle streets](#), nor living streets or shared spaces, nor shared bus lanes.
- For the total road network, the same criteria and limitations apply as mentioned for the 'Safe Streets' indicator above.
- In absence of official city data, OSM data compiled by the European Cyclists' Federation (ECF) was used, following ECF's [cycling infrastructure tracker methodology](#) selecting OSM objects with key highways and the following values:
 - (highway = cycleway) & ((foot != designated) | (segregated = yes))
 - (highway = footway | path | pedestrian) & (bicycle = designated) & (segregated = yes)
 - cycleway* = track | opposite_track
 - (highway = footway | path | pedestrian) & (bicycle = designated) & (segregated != yes)
 - (highway = cycleway) & (foot = designated) & (segregated != yes)

Uncertainties and limitations

- The figure calculated is a ratio and is comparable to, but not equivalent to, the share of the road network that is equipped with protected cycling infrastructure, as not all cycling infrastructure is necessarily adjacent to a road.
- Road junctions are often collision hotspots for cyclists but are not counted and not addressed by this indicator. Proper junction design and treatment is also essential for safe cycling networks.
- The indicator is purely quantitative in the sense that it only counts the length of protected cycling infrastructure but doesn't assess the quality of the existing protected cycling infrastructure (e.g. whether minimum design standards are respected, whether the infrastructure is located at the most frequented routes or whether this results in a coherent and attractive cycling network).
- Differences in definitions or methodologies for counting different cycling infrastructure types across cities can influence the figures provided by cities.
- Missing OSM data might distort city figures, OSM tagging guidelines might not have been applied correctly when mapping.

Annex 3: scoring and grading

For each of the three indicators, the cities' results were scored on a scale of 0 to 10 points, with 0 being the worst and 10 the best score. The lower and upper thresholds as well as the scoring approach for the indicators are outlined below.

School streets

For the share of primary schools with temporary or permanent school streets, the lower threshold (0 points) was set to 0%, reflecting the absence of any school street. The upper threshold (10 points) was set to 80% based on considering both the current progress of leading cities and our demand that all European cities establish school streets in front of every primary school by 2030. An [analysis](#) of the potential for school streets around primary schools in the Brussels-Capital region by *Les Chercheurs d'Air* found that for around 70% of all primary schools there are no major barriers and the city could thus put in place a school street in the short term, suggesting that more than 70% of primary schools could receive a school street in the medium term.

The scoring approach used is shown in the table below. To reward cities that have started deploying permanent school streets, it differentiates strongly between cities that have not a single school street (0 points) and those that have created at least one or more (3 points) even if this does not represent an important percentage of all schools (<2% of all primary schools). A second bracket (2 to 10%) is assigned 4 points. The following brackets correspond to 10% (10 to <40%) and 20% (40 to <80%) increases up to the maximum of 10 points, which is awarded to any city with 80% or more of primary schools equipped with school streets.

Score	Points
≥80%	10
60 - <80%	9
40 - <60%	8
30 - <40%	7
20 - <30%	6
10 - <20%	5
2 - <10%	4
>0 - <2%	3
0	0

Table 8. Scoring scale for the school streets indicator

Safe speeds

For the share of the road network with a maximum speed of 30km/h or less, the lower threshold (0 points) was set to 0%, i.e. no 30km/h speed limit applicable in the entire city area. The upper threshold (10 points) was set to the theoretical maximum of 100%, i.e. the entire road network has a speed limit of 30km/h or less. Results are assigned a score according to the scale shown below.

Scores	Points
100%	10
90% - <100%	9
80% - <90%	8
70% - <80%	7
60% - <70%	6
50% - <60%	5
40% - <50%	4
30% - <40%	3
20% - <30%	2
10% - <20%	1
0 - <10%	0

Table 9. Scoring scale for the safe speeds indicator

Protected cycling infrastructure

For the ratio of the protected cycling infrastructure, the lower threshold (0 points) was set to 0%, representing the complete absence of any protected cycling infrastructure. The upper threshold (10 points) was set to 0.50, reflecting the results of the best performing cities and an expert judgment on what ratio is sufficiently high to enable people to reach most daily destinations using protected cycling infrastructure. Results between the two were assigned scores using linear interpolation for any results between 0 and 0.50.

Overall score and grade

The overall score was calculated as the sum of the individual scores for each indicator and ranges therefore between a minimum of 0 points and a maximum of 30 points. Each indicator is equally weighted and contributes to a third of the total potential score.

Finally, each overall score is assigned a school grade (A-F), with A representing the best and F the worst performance. The grading table used is shown below:

Score out of 100%	Grade
80% up to 100%	A
60% up to 80%	B
40% up to 60%	C
20% up to 40%	D
10% up to 20%	E
< 10%	F

Table 10. Grading scale for the overall score

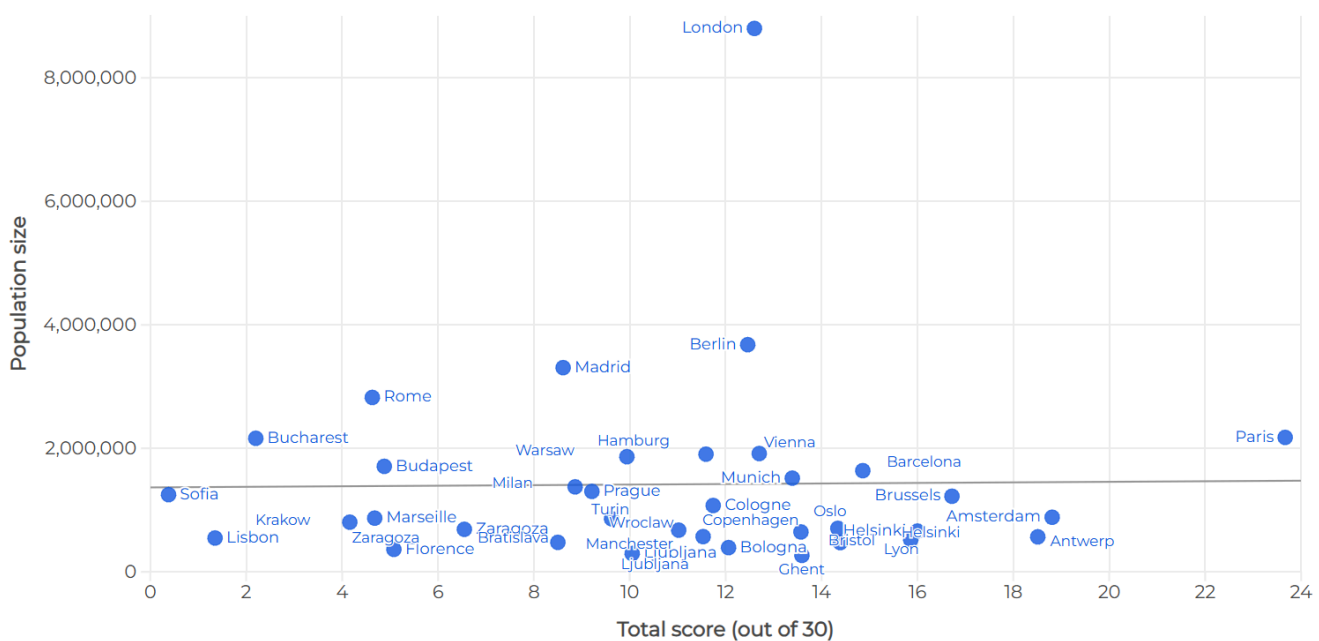
Annex 5: correlation of total score with population size and density

In addition to the correlation analysis presented in the report, we also analysed whether the overall scores were correlated with city population or population density in order to assess to what extent these characteristics might generally influence the ability of cities to promote child-friendly mobility.

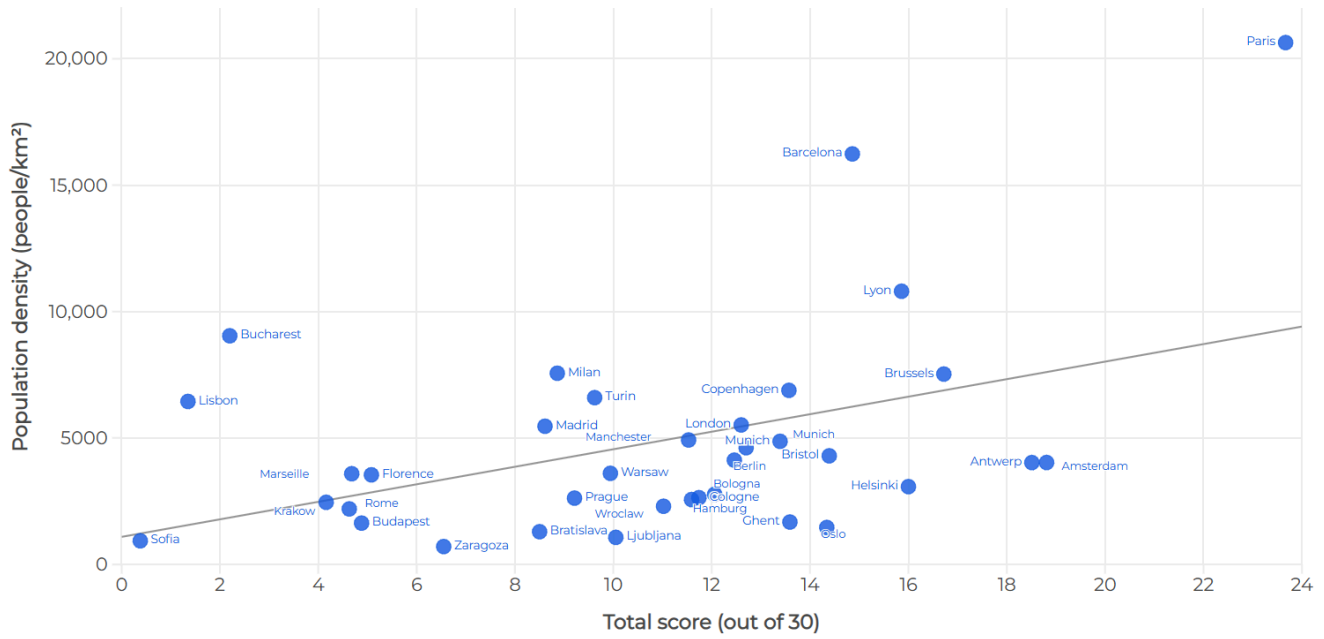
The first scatterplot illustrates the relationship between a city's total score and its overall population size. The very weak correlation coefficient ($r = 0.016$), indicates that the city's population size is not decisive for their performance in child-friendly urban mobility. Both heavily populated cities and those with fewer residents can achieve meaningful actions to encourage children's active mobility.

In contrast, the second scatterplot compares the total scores against population density, showing a moderate positive correlation ($r = 0.437$). This suggests that cities with higher scores tend to be more densely populated, highlighting that compact urban environments may be more conducive to implementing child-friendly mobility measures such as school streets, protected cycling infrastructure and generalised 30km/h speed limits.

There is no relationship between the total score and a city's population size



Cities with a higher overall score have higher population density



Moderate positive correlation (0.437), i.e. cities with a high score tend to be more densely populated.