

Health Impact Assessment of Cycling Network Expansions in European Cities  
Supplementary material

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**Table 1. Transport infrastructure of the seven PASTA cities**

City	Country	Cycling network distance		Street network distance	
		Cycling network km (OSM) <sup>a</sup>	Km/ 100,000 persons	Street network km (OSM) <sup>b</sup>	Km/ 100,000 persons
Antwerp	Belgium	451.24	91.43	1654.52	335.25
Barcelona	Spain	155.09	9.57	1550.78	95.67
London	United Kingdom	938.18	10.82	16596.90	191.35
Örebro	Sweden	355.12	255.57	3012.87	2168.28
Rome	Italy	120.11	4.19	8251.02	287.55
Vienna	Austria	715.45	39.81	3949.36	219.73
Zurich	Switzerland	118.96	28.99	1190.14	289.99

<sup>a</sup>OpenStreetMaps (OSM) data last updated 03/10/2016

<sup>b</sup>OpenStreetMap (OSM) last updated 23/09/2016

**Table 2. Baseline transport data for the seven PASTA cities**

City	Population	Trips/ person/ day	Transport mode															
			Car				Public transport				Bicycle				Walking			
			%	Persons/ day	Mean distance (km)	Mean time (h)	%	Persons/ day	Mean distance (km)	Mean time (h)	%	Persons/ day	Mean distance (km)	Mean time (h)	%	Persons/ day	Mean distance (km)	Mean time (h)
Antwerp <sup>a</sup>	493,517	2.7	41	202,342	11.81	0.30	16	78,963	9.81	0.57	23	113,509	3.84	0.24	20	98,703	1.31	0.35
Barcelona <sup>b</sup>	1,620,943	3.7	26	344,915	8.77	0.43	40	530,638	6.71	0.55	2	26,532	3.50	0.27	32	424,510	1.35	0.27
London <sup>c</sup>	8,673,713	2.5	38	2,980,311	7.00	0.38	29	2,274,448	7.00	0.75	3	235,288	3.00	0.38	30	2,352,877	1.00	0.27
Örebro <sup>d</sup>	138,952	2.6	55	58,385	7.90	0.30	9	9,554	10.00	0.60	25	26,538	3.30	0.30	11	11,677	1.20	0.30
Rome <sup>e</sup>	2,869,461	2.6	54	1,017,692	11.00	0.73	29	546,538	11.50	0.82	1	18,846	7.70	0.40	16	301,538	NA	NA
Vienna <sup>f</sup>	1,797,337	3.4	27	340,585	12.00	0.40	39	491,955	8.20	0.47	6	75,685	3.30	0.31	28	353,199	1.00	0.25
Zurich <sup>g</sup>	410,404	3.8	30	123,121	5.27	0.31	39	160,058	7.84	0.51	4	16,416	2.77	0.24	27	110,809	1.13	0.27

NA=Not available

<sup>a</sup> Population data is from 2011, mode share data is from 2011, and mean distance and time traveled is from 2013.

<sup>b</sup> Population data is from 2012, mode share data is from 2012, and mean distance and time traveled is from 2006, 2015.

<sup>c</sup> Population data is from 2015, mode share data is for 2012, and mean distance and time traveled is for 2013.

<sup>d</sup> Population data is from 2012, mode share data is for 2011, and mean distance and time traveled is for 2011.

<sup>e</sup> Population data is from 2014, mode share data is for 2014, and mean distance and time traveled is for 2014.

<sup>f</sup> Population data is from 2015, mode share data is for 2012, and mean distance and time traveled is for 2013.

<sup>g</sup> Population data is from 2015, mode share data is for 2010, and mean distance and time traveled is for 2010.

**Table 3. Scenarios and mode share estimations**

City	Mode share				Cycling infrastructure	
	Car (%)	Public transport (%)	Cycling (%)	Walking (%)	Cycling km	Cycling km/100,000 persons
<b>Antwerp (baseline)</b>	41.00	16.00	23.00	20.00	451.24	91.43
S1 10%	41.78	18.35	19.87	20.00	496.37	100.58
S2 50%	41.08	16.24	22.68	20.00	676.87	137.15
S3 100%	40.73	15.19	24.08	20.00	902.49	182.87
S4 Go-Örebro	40.59	14.76	24.65	20.00	1261.29	255.57
S5 All-streets	40.57	14.70	24.74	20.00	1654.52	335.25
<b>Barcelona (baseline)</b>	26.00	40.00	2.00	32.00	155.09	9.57
S1 10%	25.76	39.27	2.97	32.00	170.60	10.52
S2 50%	25.60	38.79	3.61	32.00	232.64	14.35
S3 100%	25.38	38.13	4.50	32.00	310.19	19.14
S4 Go-Örebro	20.34	23.01	24.65	32.00	4142.66	255.57
S5 All-streets	21.68	27.03	19.30	32.00	1550.78	95.67
<b>London (baseline)</b>	38.00	29.00	3.00	30.00	938.18	10.82
S1 10%	37.95	28.85	3.20	30.00	1031.99	11.90
S2 50%	37.76	28.29	3.95	30.00	1407.26	16.22
S3 100%	37.50	27.51	4.99	30.00	1876.35	21.63
S4 Go-Örebro	32.59	12.76	24.65	30.00	22167.50	255.57
S5 All-streets	32.70	13.09	24.21	30.00	16596.90	191.35
<b>Örebro (baseline)</b>	55.00	9.00	25.00	11.00	355.12	255.57
S1 10%	55.07	9.22	24.71	11.00	390.63	281.13
S2 50%	55.06	9.18	24.76	11.00	532.68	383.36
S3 100%	55.06	9.18	24.76	11.00	710.24	511.14
S4 Go-Örebro	55.09	9.26	24.65	11.00	355.12	255.57
S5 All-streets	55.06	9.18	24.76	11.00	3012.87	2168.28
<b>Rome (baseline)</b>	54.00	29.00	1.00	16.00	120.11	4.19
S1 10%	53.72	28.16	2.12	16.00	132.12	4.60
S2 50%	53.67	28.00	2.34	16.00	180.16	6.28
S3 100%	53.58	27.75	2.67	16.00	240.22	8.37
S4 Go-Örebro	48.09	11.26	24.65	16.00	7333.51	255.57
S5 All-streets	55.06	9.18	24.76	11.00	3012.87	2168.28
<b>Vienna (baseline)</b>	27.00	39.00	6.00	28.00	715.45	39.81
S1 10%	26.03	36.08	9.89	28.00	787.00	43.79
S2 50%	25.16	33.47	13.38	28.00	1073.18	59.71
S3 100%	24.24	30.71	17.05	28.00	1430.91	79.61
S4 Go-Örebro	22.34	25.01	24.65	28.00	4593.47	255.57
S5 All-streets	22.38	25.13	24.49	28.00	3949.36	219.73
<b>Zurich (baseline)</b>	30.00	39.00	4.00	27.00	118.96	28.99
S1 10%	29.21	36.62	7.18	27.00	130.85	31.88
S2 50%	28.55	34.64	9.81	27.00	178.43	43.48
S3 100%	27.75	32.24	13.02	27.00	237.91	57.97
S4 Go-Örebro	24.84	23.51	24.65	27.00	1048.87	255.57
S5 All-streets	24.82	23.47	24.71	27.00	1190.14	289.99

S=Scenario

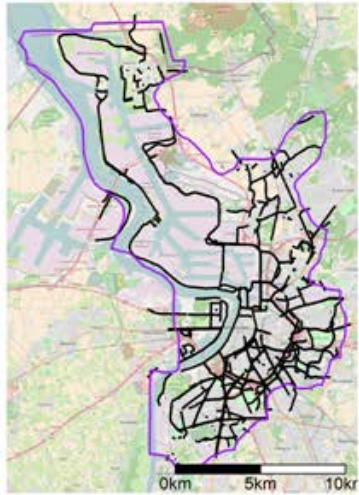
**Table 4. Mortality impact (avoided premature deaths/ year) for each scenario**

City	Physical activity (deaths avoided) (95% CI)	Air pollution active traveler (additional deaths) (95% CI)	Traffic incidents (additional deaths) (95% CI)	Total deaths (95% CI)	Total deaths (per 100,000 persons) (95% CI)
<b>Antwerp</b>					
S1 10%	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
S2 50%	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
S3 100%	-3 (-2;-4)	1 (0;0)	0 (0;0)	-2 (-2;-4)	0 (0;-1)
S4 Go-Örebro	-4 (-3;-6)	1 (0;1)	0 (0;0)	-3 (-2;-6)	-1 (-1;-1)
S5 All-streets	-5 (-3;-6)	1 (0;1)	0 (0;0)	-4 (-2;-6)	-1 (-1;-1)
<b>Barcelona</b>					
S1 10%	-9 (-6;-12)	1 (1;1)	0 (0;0)	-8 (-5;-11)	0 (0;-1)
S2 50%	-14 (-10;-19)	2 (1;2)	1 (1;1)	-11 (-7;-17)	-1 (0;-1)
S3 100%	-22 (-16;-30)	3 (2;4)	1 (1;1)	-18 (-11;-27)	-1 (-1;-2)
S4 Go-Örebro	-199 (-147;-274)	26 (15;33)	11 (11;11)	-162 (-103;-248)	-10 (-6;-15)
S5 All-streets	-152 (-112;-209)	20 (12;25)	8 (8;8)	-124 (-79;-189)	-8 (-5;-12)
<b>London</b>					
S1 10%	-8 (-6;-11)	1 (0;1)	1 (1;1)	-6 (-4;-10)	0 (0;0)
S2 50%	-36 (-27;-50)	5 (3;7)	3 (3;3)	-28 (-17;-44)	0 (0;-1)
S3 100%	-76 (-56;-105)	11 (6;14)	5 (5;5)	-59 (-36;-93)	-1 (-1;-1)
S4 Go-Örebro	-823 (-606;-1139)	120 (69;152)	57 (57;57)	-646 (-397;-1012)	-7 (-5;-12)
S5 All-streets	-806 (-594;-1116)	117 (68;149)	56 (56;56)	-633 (-389;-992)	-7 (-4;-11)
<b>Örebro</b>					
S1 10%	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
S2 50%	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
S3 100%	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
S4 Go-Örebro	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
S5 All-streets	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)	0 (0;0)
<b>Rome</b>					
S1 10%	-14 (-10;-19)	3 (2;3)	1 (1;1)	-11 (-6; -17)	0 (0;-1)
S2 50%	-17 (-12;-23)	3 (2;4)	1 (1;1)	-13 (-8; -20)	0 (0;-1)
S3 100%	-21 (-15;-28)	4 (2;5)	1 (1;1)	-16 (-9;-25)	-1 (0;-1)
S4 Go-Örebro	-291 (-215;-403)	55 (32;70)	12 (12;12)	-224 (-133;-359)	-8 (-5;-13)
S5 All-streets	-292 (-215;-404)	55 (32;70)	12 (12;12)	-225 (-133;-360)	-8 (-5;-13)
<b>Vienna</b>					
S1 10%	-22 (-16;-31)	5 (3;6)	1 (1;1)	-17 (-10;-28)	-1 (-1;-2)
S2 50%	-42 (-31;-59)	9 (5;11)	1 (1;1)	-32 (-19;-53)	-2 (-1;-3)
S3 100%	-63 (-46;-88)	13 (8;16)	2 (2;2)	-49 (-28;-79)	-3 (-2;-4)
S4 Go-Örebro	-107 (-78;-149)	22 (13;28)	3 (3;3)	-82 (-47;-133)	-5 (-3;-7)
S5 All-streets	-106 (-78;-148)	22 (13;28)	3 (3;3)	-90 (-47;-132)	-5 (-3;-7)
<b>Zurich</b>					
S1 10%	-5 (-4;-7)	1 (0;1)	0 (0;0)	-4 (-3;-7)	-1 (-1;-2)
S2 50%	-10 (-7;-13)	2 (1;2)	1 (1;1)	-7 (-4;-12)	-2 (-1;-3)
S3 100%	-15 (-11;-21)	2 (1;3)	1 (1;1)	-12 (-7;-18)	-3 (-2;-4)
S4 Go-Örebro	-34 (-25;-47)	5 (3;7)	2 (2;2)	-27 (-16;-42)	-6 (-4;-10)
S5 All-streets	-34 (-25;-48)	5 (3;7)	2 (2;2)	-27 (-16;-43)	-6 (-4;-10)

S=Scenario; 95% CI =95% Confidence Interval

Figure 1. Cycling networks of the seven PASTA cities

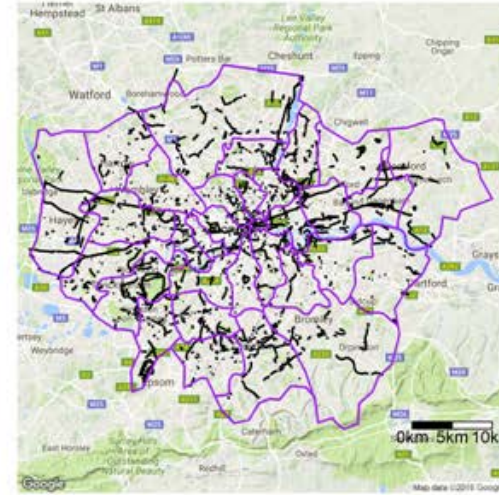
**Antwerp, Belgium**



**Barcelona, Spain**



**London, UK**



**Örebro, Sweden**



**Rome, Italy**



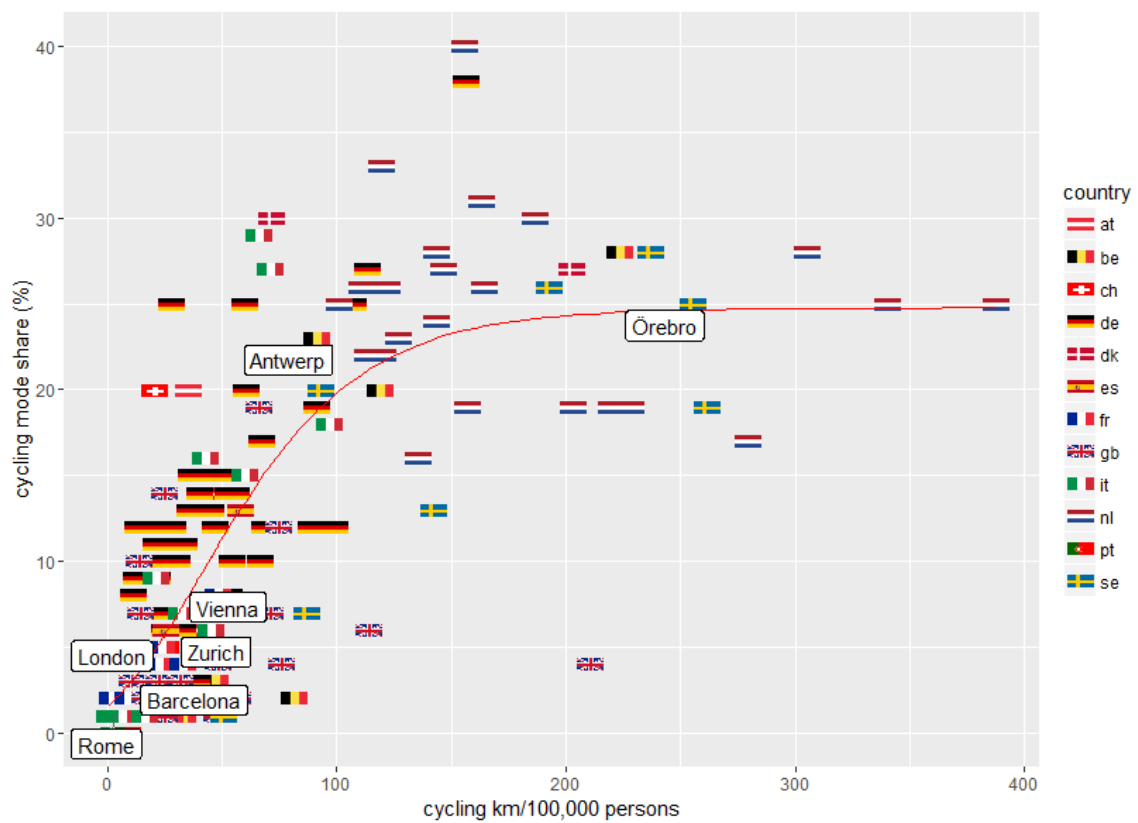
**Vienna, Austria**



**Zurich, Switzerland**



Figure 2. Association between cycling network distance and cycling mode share in European cities



Cycling network distance (km) and mode share (%) data were available for 168 European cities. The cycling network distance was available through OpenStreetMap (OMS) and the mode share data through the European Platform on Mobility Management (EPOMM).