Physical Activity and the Environment

Evidence Reviews – Appendix 3

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1. Search Strategy

Search methods

A systematic search of electronic databases was conducted to identify relevant studies. Searching took place on 22-24 June 2016 for transport interventions and on 29 June 2016 for open space interventions. The strategies were developed by an information specialist at NICE and peer reviewed by a colleague from the same team.

The databases were searched using a combination of subject headings and free-text terms arranged in the following format:

- (Physical activity AND Transport interventions) OR Named interventions AND 2006-2016 AND Limits
- (Physical activity AND Open space interventions) AND 2006-2016 AND Limits

Date limits were applied to restrict the database results to 2006-Current. Database functionality was used, where available, to exclude:

- non-English language papers
- studies reporting experiments on animals
- editorials, letters and commentaries
- conference abstracts and posters
- theses and dissertations
- duplicates.

The search strategy was developed in MEDLINE (Ovid interface, 1946 to June 2016) after discussing with PHAC members at meeting 0 in June 2016. The strategy was adapted for use in the other databases, taking into account their size, search functionality and subject coverage. The following databases were searched:

- Applied Social Science Index and Abstracts (ASSIA) via ProQuest - 1987-Current
- Cochrane Central Register of Controlled Trials (CENTRAL) via Wiley - Issue 5 of 12, May 2016
- Cochrane Database of Systematic Reviews (CDSR) via Wiley - Issue 6 of 12, June 2016
- Database of Abstracts of Reviews of Effects (DARE) via Wiley - Issue 2 of 4, April 2015 (last date of entry, no longer being updated)

- Embase via Ovid - 1974 to 2016 June 22 [transport interventions]; 1974 to 2016 Week 26 [open space]
- Greenfile via EBSCO
- Health Management Information Consortium (HMIC) via Ovid - 1979 to May 2016
- MEDLINE via Ovid - 1946 to June Week 3 2016
- MEDLINE-in-Process via Ovid - Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations June 22, 2016 [transport interventions]; June 28, 2016 [open space]
- Social Policy and Practice (SPP) via Ovid - 201604
- Transport via Ovid - Pre-1987 to May 2016
- Trials Register of Promoting Health Interventions (TRoPHI) via https://eppi.ioe.ac.uk/webdatabases4/Intro.aspx?ID=12

The following additional databases were searched to identify cost effectiveness literature:

- Benefit-Costs Results via http://www.wsipp.wa.gov/BenefitCost
- Health Technology Assessment database via Wiley - Issue 2 of 4, April 2016
- EconLit via Ovid - 1886 to May 2016
- EconPapers via http://econpapers.repec.org
- NHS Economics Evaluation Database (NHS EED) via Wiley - Issue 2 of 4, April 2015 (last date of entry, no longer being updated)

The MEDLINE strategy is presented below and the full strategies for the other sources are available on request.

The database searches were supplemented by extracting potentially relevant references from:

- The draft scope consultation for this topic
- NICE Evidence Update (April 2014) Physical activity and the environment
- Papers cited in the surveillance review “Consideration of an update of the public health guidance on ‘Physical activity and the environment’ (PH8). April 2014”.
- The internal NICE document “What’s new in your subject? Public health” from January 2015 to June 2016
- Suggestions received from topic experts, committee members, stakeholders and others

- Papers marked as possibly relevant during the screening process for “Surveillance report - physical activity: walking and cycling (2012) NICE guideline PH41”
- Papers cited in a forthcoming systematic review received in confidence.

The results from this reference harvesting were added to the relevant EndNote files.

For transport interventions, the 10,060 results (10041 from database searching and 19 from reference harvesting) were processed in EndNote and 2325 duplicates were removed using a combination of automated and manual processes. There were 7735 records remaining after removing the duplicates. The 7735 records were exported from EndNote in a ris file for uploading to EPPI-Reviewer.

For the open space interventions, the 10,366 results (10292 from database searching and 74 from reference harvesting) were processed in EndNote and 2578 duplicates were removed using a combination of automated and manual processes. There were 7788 records remaining after removing the duplicates. The 7788 records were exported from EndNote in a ris file for uploading to EPPI-Reviewer.

Systematic reviews potentially relevant to any of the review questions were marked during the screening process for further investigation. The reference lists of 18 relevant systematic reviews that closely met the inclusion criteria were checked. Of the studies included in these systematic reviews, twenty three appeared relevant and were screened at title and abstract. Full papers were ordered for 7 studies. Of these, 4 were included.

A search of relevant websites was conducted from 1 to 5 August 2016. The websites were selected after consultation with PHAC members at meeting 0 in June 2016 and they are listed below. The websites were browsed on screen and the details of documents relevant to any of the review questions were added to a Word document. 259 results were recorded in Word for initial screening.

Search strategy: transport interventions

Database name: MEDLINE
Date searched: 23 June 2016
Searcher: Paul Levay
QA: Tom Hudson
Database platform: Ovid
Database version: Ovid MEDLINE(R) 1946 to June Week 3 2016
No. of results: 3170

Ovid MEDLINE(R) 1946 to June Week 3 2016

Search Strategy:

#	Searches	Results
1	Physical Fitness/	24137
2	Recreation/	5913
3	hobbies/	836
4	leisure activities/	7225
5	Exercise/	78946
6	exp running/	15973
7	exp walking/	24628
8	bicycling/	8984
9	motor activity/	87976
10	((physical or leisure) adj1 (fit* or train* or activit* or endurance* or exercis*) adj3 (barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent* or refus* or facilitat* or uptak* or taking up or take up or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or availab* or provision or provid* or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or disincentiv* or higher* or lower* or affect*)).ti,ab.	27347

11	(outdoor* adj3 (activit* or pursuit* or experience* or adventure* or event*) adj3 (barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent* or refus* or facilitat* or uptak* or taking up or take up or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or availab* or provision or provid* or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or disincentiv* or higher* or lower* or affect*)).ti,ab.	219
12	((bicycle* or exercis* or fitness or walking* or running* or exertion or jogging* or bicycling* or cycling* or bike*1 or biking or hobbies or hobby or rollerskat* or roller skat* or roller blad* or rollerblad* or hike* or hiking or rambling* or ramblers or strength training or resilience training) adj3 (barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent* or refus* or facilitat* or uptak* or taking up or take up or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or availab* or provision or provid* or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or disincentiv* or higher* or lower* or affect*)).ti,ab.	95350
13	((active* or multimodal* or multi-modal* or mixed or healthy or healthier or modal* shift*) adj3 (travel* or trip*1 or transport* or commute* or commuting)).ti,ab.	13162
14	(active* adj3 (living or lifestyle* or ageing or aging or play* or game*)).ti,ab.	7584
15	(physical activit* adj3 (daily or everyday* or incidental* or intens*)).ti,ab.	4167
16	((avoid* or barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent*) adj3 (sedentary or deskbound* or desk bound* or inactiv*)).ti,ab.	12668
17	or/1-16	320753
18	Transportation/	7998
19	exp Motor Vehicles/	17234
20	exp Railroads/	2584
21	Automobile Driving/	15694
22	parking facilities/	342

23	((cycle* or cycling or bike* or bicycl* or cyclist*) adj4 (route* or lane* or path* or trail* or infrastructure* or network* or corridor* or facilit* or storage* or store* or storing or rack* or park* or equipment* or segregat* or highway* or superhighway* or hire* or hiring)).ti,ab.	7906
24	((walk* or pedestrian*1) adj4 (route* or lane* or path* or trail* or infrastructure* or network* or corridor*)).ti,ab.	1130
25	(speed* adj3 (hump* or bump* or limit* or restrict* or reduc* or chicane* or camera* or mph or miles per hour or "m.p.h." or kph or "k.p.h." or kilometres per hour or kilometers per hour)).ti,ab.	4511
26	((limit* or restrict*) adj3 (mph or miles per hour or "m.p.h." or kph or "k.p.h." or kilometres per hour or kilometers per hour)).ti,ab.	79
27	((automobile* or autos or car or cars or motorcycle* or motorbike* or traffic or vehic* or motoring) adj3 (restrict* or restrain* or inhibit* or imped* or delay* or constrain* or decreas* or reduc* or discourag* or prevent* or disincentiv*)).ti,ab.	4479
28	((car or cars) adj3 (use* or usage* or trip* or journey* or share* or sharing or pool* or club*)).ti,ab.	887
29	((driver*1 or motorist*) adj3 (behaviour* or behavior*)).ti,ab.	858
30	((congestion or "rush hour" or tailback* or "tail back*" or road*) adj3 (charge* or charging or price or pricing or zone* or toll or tolls or pay or payment* or levy or levies or tax* or tariff* or duty or duties)).ti,ab.	199
31	((road* or street* or highway*) adj3 (safety or open or calm* or closing or closure* or restrict* or limit* or play* or design* or redesign* or layout* or placement* or chicane* or furniture*)).ti,ab.	2931
32	((junction* or intersection* or roundabout* or pavement* or sidewalk* or footpath* or trail* or kerb* or paving*) adj3 (safety or design* or redesign* or layout* or placement* or repair* or disrepair* or fix or fixing or maintenance* or broke* or dropped or dropping)).ti,ab.	933
33	((road* or street* or highway* or pedestrian*1 or zebra or toucan or pelican or puffin or cone or tactile) adj3 crossing*).ti,ab.	438
34	((parking* or car park*) adj3 (restrict* or restrain* or inhibit* or imped* or delay* or constrain* or decreas* or reduc* or discourag* or prevent* or disincentiv* or workplace* or ratio* or density or densities or charge* or charging or price or pricing or zone* or toll or tolls or pay or payment* or levy or levies or tax* or control*)).ti,ab.	65
35	((shared or share or sharing or allocat* or reallocat* or segregat* or demarcat* or tactile) adj3 (space* or street* or road* or highway* or route* or walkway* or pavement* or footpath* or path* or lane* or trail* or surface*)).ti,ab.	6586

36	(railtrail* or rail trail* or busway* or bus way or playstreet* or play street* or school street* or schoolstreet* or walkab* or safe* route* or cycleway* or cycle way* or traffic calm* or green corridor* or pedestrianis* or pedestrianiz* or carpool* or streetscap* or LEZ or low emission* zone* or rideshar*).ti,ab.	855
37	((bus or buses) adj4 (route* or lane* or infrastructure* or network* or corridor*)).ti,ab.	105
38	((public or community or affordable or rural or sustainable* or green) adj3 (travel* or transport*)).ti,ab.	1928
39	((mechanised or mechanized or motor*4 or personal or private) adj3 (travel* or transport* or vehicle*) adj3 (restrict* or restrain* or inhibit* or imped* or delay* or constrain* or decreas* or reduc* or discourag* or prevent* or disincentiv*)).ti,ab.	460
40	((railway* or light rail* or railroad* or bus or buses or tram or trams or tramway* or train or trains or streetcar* or subway* or underground rail* or non-auto or non-motor*4) adj3 (increas* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or availab* or provision or provid* or offer or incentiv* or start* or utiliz* or utilis* or sustain* or maintain*)).ti,ab.	1732
41	(park adj2 ride*).ti,ab.	14
42	or/18-41	70224
43	17 and 42	5085
44	(ciclovia* or iconnect* or connect2* or guided bus* or "cycling city" or "cycling cities" or "walking city" or "walking cities" or Bikeability or "Cycling Cities and Towns" or "cycling demonstrator town*" or ipen or "International Physical activity and Environment Network" or open streets or dutch roundabout* or bikeshar*).ti,ab.	110
45	43 or 44	5148
46	animals/ not humans/	4233089
47	45 not 46	4782
48	limit 47 to (letter or historical article or comment or editorial or news)	168
49	47 not 48	4614
50	limit 49 to english language	4381
51	limit 50 to yr="2006-Current"	3332

52	remove duplicates from 51	3170

Search strategy – open space interventions

Database name: Medline
Date searched: 29 June 2016
Searcher: Paul Levay
QA: Tom Hudson
Database platform: Ovid
Database version: Ovid MEDLINE(R) 1946 to June Week 3 2016
No. of results: 3517

Database(s): **Ovid MEDLINE(R)** 1946 to June Week 3 2016

Search Strategy:

#	Searches	Results
1	Physical Fitness/	24137
2	Dancing/	2171
3	gardening/	679
4	Recreation/	5913
5	hobbies/	836
6	leisure activities/	7225
7	Exercise/	78946
8	exp Exercise Movement Techniques/	6142
9	exp Sports/	147020
10	exp walking/	24628
11	motor activity/	87976

12	((physical or leisure) adj1 (fit* or train* or activit* or endurance* or exercis*) adj3 (barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent* or refus* or facilitat* or uptak* or taking up or take up or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or availab* or provision or provid* or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or disincentiv* or higher* or lower* or affect*)).ti,ab.	27347
13	(outdoor* adj3 (activit* or pursuit* or experience* or adventure* or event*) adj3 (barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent* or refus* or facilitat* or uptak* or taking up or take up or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or availab* or provision or provid* or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or disincentiv* or higher* or lower* or affect*)).ti,ab.	219
14	((bicycle* or aqua* or exercis* or fitness or walking* or running* or sport* or yoga or tai ji or tai chi or swim* or exertion or jogging* or bicycling* or cycling* or bike*1 or biking or dancing or dance* or gardening* or hobbies or hobby or athletic* or boxing* or football* or golf* or gym* or hockey* or martial art* or karate* or judo or mountaineer* or rugby* or skating* or soccer* or ski* or snowboard* or snow board* or volleyball* or water ski* or wakeboard* or weight lift* or wrestling* or tennis* or badminton* or canoe* or yacht* or rowing or kayak* or bodyboard* or windsurf* or sail* or basketball* or netball* or cricket* or baseball* or lacrosse* or rollerskat* or roller skat* or roller blad* or rollerblad* or hike* or hiking or rambling* or ramblers or orienteering* or climbing or abseil* or aerobics or pilates or "keep fit" or circuits or strength training or resilience training) adj3 (barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent* or refus* or facilitat* or uptak* or taking up or take up or increas* or impact* or effect* or improv* or enhanc* or encourag* or support* or promot* or optimiz* or optimis* or adher* or access* or motivat* or accept* or satisfaction or compliance or comply or complie* or availab* or provision or provid* or offer or incentiv* or start* or attend* or utiliz* or utilis* or sustain* or maintain* or disincentiv* or higher* or lower* or affect*)).ti,ab.	193387
15	((active* or multimodal* or multi-modal* or mixed or healthy or healthier or modal* shift*) adj3 (travel* or trip*1 or transport* or commute* or commuting)).ti,ab.	13162
16	(active* adj3 (living or lifestyle* or ageing or aging or play* or game*)).ti,ab.	7584
17	(physical activit* adj3 (daily or everyday* or incidental* or intens*)).ti,ab.	4167

18	((avoid* or barrier* or hinder* or block* or obstacle* or restrict* or restrain* or obstruct* or inhibit* or imped* or delay* or constrain* or hindrance or decreas* or reduc* or discourag* or prevent*) adj3 (sedentary or deskbound* or desk bound* or inactiv*)).ti,ab.	12668
19	or/1-18	474847
20	Forests/	2342
21	Wetlands/	4497
22	exp fresh water/	45821
23	wilderness/	183
24	trees/	21431
25	bathing beaches/	960
26	public facilities/	1023
27	parks, recreational/	106
28	cities/	11279
29	urban population/	51695
30	urbanization/	4785
31	or/20-30	137247
32	Esthetics/	9666
33	environment design/	4630
34	"Environmental Restoration and Remediation"/	5507
35	Conservation of Natural Resources/	30859
36	"Architecture as Topic"/	2430
37	Toilet facilities/	1255

38	parking facilities/	342
39	"Play and playthings"/	7812
40	health promotion/	61011
41	exp social planning/	9425
42	Health Impact Assessment/	316
43	exp Public Policy/	120310
44	exp Policy Making/	21302
45	or/32-44	250272
46	31 and 45	11139
47	(natural environment* or nature reserve* or nature preserve* or moors or moorland* or heathland* or rural or countryside* or green* or field* or garden*1 or allotment* or outdoor* or park or parks or parkland* or wood or woods or woodland* or forest* or tree* or wetland* or river* or lake* or pond* or canal* or waterway* or sea or seaside* or seashore* or beach* or coast* or foreshore* or piazza* or plaza* or square* or public space* or public realm* or public land* or common land* or recreation* space* or recreation* area* or recreation* ground* or conservation* or footpath* or pedestrianis* or pedestrianiz* or piazza* or pavement* or sidewalk* or footpath* or streetscape* or openspace* or open space* or greyspace* or grey space* or bluespace* or blue space*).ti,ab.	1166021
48	((urban* or town* or city* or cities* or neighbourhood or neighborhood*) adj4 (environment* or square* or plaza* or space*)).ti,ab.	6548
49	47 or 48	1169721
50	(impact adj4 assess*).ti,ab.	30770
51	((local or regional* or city or cities or county* or council* or neighbourhood* or neighborhood* or town* or administration*) adj3 (plan or plans or planning or policy or policies or recommendation* or strategy or strategies or guidance* or guideline*)).ti,ab.	12353
52	(planning adj4 (application* or policy or policies or recommendation* or strategy or strategies or guidance* or guideline*)).ti,ab.	7033
53	((cycle* or cycling or bike* or bicycl* or cyclist*) adj4 (route* or lane* or path* or trail* or infrastructure* or network* or corridor* or facilit* or storage* or store* or storing or rack* or park* or equipment* or segregat* or highway* or superhighway* or hire* or hiring)).ti,ab.	7906

54	((pavement* or sidewalk* or footpath* or trail*) adj4 (safety or design* or redesign* or layout* or placement* or sign or signs or signpost* or signage or wayfind* or way find*)).ti,ab.	287
55	((walk* or pedestrian*1) adj4 (route* or lane* or path* or trail* or infrastructure* or network* or corridor*)).ti,ab.	1130
56	(play* adj4 (ground* or area* or facility or facilities or amenit* or equipment* or space*)).ti,ab.	2862
57	(playground* or playspace*).ti,ab.	1093
58	or/50-57	62430
59	49 and 58	8418
60	(eaprs or "environmental assessment of public recreation spaces" or soparc or "System for Observing Play and Recreation in Communities" or "healthy town*" or "healthy new town*" or "age friendly city*" or "age friendly cities" or "urban 40" or "pocket park*" or "play street*" or "health* street*").ti,ab.	70
61	(environment* adj4 (campaign* or interven* or program* or project* or initiative* or scheme*)).ti,ab.	7133
62	((pavement* or sidewalk* or sign or signs or signpost* or signage or wayfind* or way find* or path* or trail* or footpath* or age friendl* or lighting or fencing or traffic* or securit* or securing or cycleway* or cycle way* or cycling* or bicycling* or transport* or parking or car park* or toilet* or lavator* or bathroom* or washroom* or shelter* or bench or benches or seat or seats or seating or opening time* or opening hour*) adj4 (natural environment* or nature reserve* or nature preserve* or moors or moorland* or heathland* or rural or countryside* or green* or field* or garden*1 or allotment* or outdoor* or park or parks or parkland* or wood or woods or woodland* or forest* or tree* or wetland* or river* or lake* or pond* or canal* or waterway* or sea or seaside* or seashore* or beach* or coast* or foreshore* or piazza* or plaza* or square* or public space* or public realm* or public land* or common land* or recreation* space* or recreation* area* or recreation* ground* or openspace* or open space* or greyspace* or grey space* or bluespace* or blue space*)).ti,ab.	11778
63	((upgrad* or promot* or landscap* or architect* or renew* or regenerat* or conserv* or preserv* or redesign* or structur* or layout* or facilit* or feature* or amenit* or develop* or design* or land us* or aesthetic* or esthetic* or access* or connect* or inclusiv* or safety or renovat* or refurb* or management* or improv* or adapt* or enhanc* or optimiz* or optimis* or sustain* or maintain* or maintenance* or beautify or beautifies or beautific* or infrastructur* or campaign* or intervention* or program* or project* or initiative* or scheme*) adj4 (natural environment* or nature reserve* or nature preserve* or moors or moorland* or heathland* or rural or countryside* or green* or field* or garden*1 or allotment* or outdoor* or park or parks or parkland* or wood or woods or woodland* or forest* or tree* or wetland* or river* or lake* or pond* or canal* or waterway* or sea or seaside* or seashore* or beach* or coast* or foreshore* or piazza* or	99022

	plaza* or square* or public space* or public realm* or public land* or common land* or recreation* space* or recreation* area* or recreation* ground* or openspace* or open space* or greyspace* or grey space* or bluespace* or blue space*)).ti,ab.	
64	46 or 59 or 60 or 61 or 62 or 63	131080
65	19 and 64	6369
66	animals/ not humans/	4233089
67	65 not 66	5355
68	limit 67 to (letter or historical article or comment or editorial or news)	132
69	67 not 68	5223
70	limit 69 to english language	5017
71	limit 70 to yr="2006-Current"	3736
72	remove duplicates from 71	3517

Website searching

The following websites were browsed from 1 to 5 August 2016:

- Active Living Research http://activelivingresearch.org/
- Active Scotland http://www.activescotland.org.uk/
- Association for the Study of Obesity http://www.aso.org.uk/
- Association of Directors of Public Health http://www.adph.org.uk/
- Big Lottery Fund https://www.biglotteryfund.org.uk/
- Centre for Active Design https://centerforactivedesign.org/
- Chartered Institute of Environmental Health http://www.cieh.org/
- Chartered Institute of Logistics and Transport https://www.ciltuk.org.uk/
- Children's Commissioner for England http://www.childrenscommissioner.gov.uk/
- Cycling UK http://www.cyclinguk.org/

- Department for Transport https://www.gov.uk/government/organisations/department-for-transport
- Design Council http://www.designcouncil.org.uk/
- Environment Agency https://www.gov.uk/government/organisations/environment-agency
- Faculty of Public Health http://www.fph.org.uk
- Greenspace Scotland http://greenspacescotland.org.uk/
- Healthy Transport http://www.healthytransport.com/tools-and-projects
- Living Streets https://www.livingstreets.org.uk/
- Local Government Association http://www.local.gov.uk/
- London Cycling Campaign http://lcc.org.uk/
- London Play http://www.londonplay.org.uk/
- National Audit Office http://www.nao.org.uk/
- Natural England https://www.gov.uk/government/organisations/natural-england
- Natural Resources Wales https://naturalresources.wales/?lang=en
- NHS England https://www.england.nhs.uk/
- Public Health Agency for Northern Ireland http://www.publichealth.hscni.net/
- Public Health England https://www.gov.uk/government/organisations/public-health-england
- Public Health Wales http://www.publichealthwales.wales.nhs.uk/
- Ramblers http://www.ramblers.org.uk/
- Royal Society for Public Health https://www.rsph.org.uk/
- Royal Town Planning Institute http://www.rtpi.org.uk/
- RNIB http://www.rnib.org.uk
- Scottish Government http://www.gov.scot/
- Scottish Natural Heritage http://www.snh.gov.uk/
- Scottish Public Health Network http://www.scotphn.net/
- Scottish Public Health Observatory http://www.scotpho.org.uk/
- Sport and Recreation Alliance http://www.sportandrecreation.org.uk/
- Sport England https://www.sportengland.org/

- Sustrans http://www.sustrans.org.uk/
- Town and Country Planning Association http://www.tcpa.org.uk/
- Transport for Greater Manchester http://www.tfgm.com/Pages/default.aspx
- Transport for London https://tfl.gov.uk/corporate/publications-and-reports/
- Transport Research & Innovation Portal http://www.transport-research.info/
- Transport Scotland http://www.transport.gov.scot/
- TRL http://www.trl.co.uk/
- UK Active http://www.ukactive.com/
- UK Health Forum http://www.ukhealthforum.org.uk/
- Urban Transport Group http://www.urbantransportgroup.org/
- Welsh Assembly Government http://www.assembly.wales/en/Pages/Home.aspx
- Wheels for Wellbeing http://www.wheelsforwellbeing.org.uk/

The following websites were searched on 5 August 2016 for terms relating to cycling, walking, physical activity, physical activities, active living, active travel and active transport:

- NICE Evidence Search http://www.evidence.nhs.uk - searches restricted to Area of Interest>Public Health and filters applied for Policy & Service Development, Population Intelligence, Guidance, Primary Research.
- OpenGrey http://www.opengrey.eu/ - searches restricted to documents from the UK and in report format from after 2006 e.g. cycling origin:"GB" doctype:(R - Report) and excluded dissertations.
- Google.co.uk - https://www.google.co.uk/ results were restricted to the .gov.uk, .org.uk and .nhs.uk domains, pdf format and the first 100 results (or 10 pages) were reviewed.

180 ## 2. Review Protocols

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Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 1	Which transport interventions are effective and cost-effective in encouraging and supporting physical activity in all population groups, including those less able to be physically active?	
Context and objectives	To determine the effectiveness and cost effectiveness of interventions that focus on transport, including the planning and provision of walking and cycling routes, prioritising the needs of active transport users and the provision of public transport, to: • support and encourage people to build physical activity into their daily lives • increase opportunities for, and uptake of, formal or informal recreational activity • reduce sedentary time • increase the opportunity for, and uptake of, active travel such as walking or cycling (including the use of adapted cycles)	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit)	• If there is a large number of includes for the question, evidence may be prioritised, where available, by study design (e.g. RCTs prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Cost-effectiveness (Cost per unit of effect) • Cost minimisation • Cost-consequence	evidence for different population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be included – papers reporting costs only will be excluded.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people	

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	Interventions which prioritise the needs of pedestrians, cyclists and users of other modes of active transport, including: • re-allocating road space to support physically active modes of transport such as cycling and walking e.g. shared road space • interventions that enable people with restricted mobility to be physically active by ensuring their local environments are accessible and can be used by all groups e.g. road crossing times, introduction/improvement of pedestrian crossings • planning and providing walking and cycling networks (such as Connect2), infrastructure links with existing networks and facilities e.g. signed only and segregated walking/cycle paths, wayfinding networks/signage, on-street cycle parking • public transport provision, networks, links and facilities (e.g. cycle parking) • parking restrictions and charges e.g. controlled parking zones, parking charges, waiting and loading restrictions • traffic-calming measures to restrict vehicle speeds e.g. sign only speed limits, physical interventions such as road humps and speed cushions • speed restrictions • road-user charging schemes e.g. congestion zones, local emission zones (LEZs) • temporary road closures e.g. ciclovia, 'School Streets' • Other named interventions e.g. 'Cycling Cities', 'Walking Cities'	The following interventions will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		the environment rather than changes to the physical environment itself. • Re traffic calming, speed cushions and speed restrictions to be aware that may be overlap with PH31 and PH29
Comparator(s)/control	Comparators that will be considered are: • Other interventions • Status quo/do nothing/control • Time (before and after) or area (i.e. matched city a vs b) comparisons	
Outcome(s)	The outcomes that will be considered when assessing the impact on physical activity are: Primary outcomes: • total physical activity (as measured by e.g. time/distance/number of steps/levels of activity/levels of recommended PA) • total sedentary time (as measured by time) • Domain-specific physical activity levels (active travel or physical activity in everyday life (such as measures of walking, cycling or active play)) • public transport use (as a proxy measure of physical activity) Secondary outcomes:	• Included studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU for economic modelling and not for the purposes of this review.

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• changes to road environment e.g. introduction of traffic calming measures • changes to transport (such as changes in modal share) • vehicle speeds • car use	

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Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 2	Does the effectiveness and cost effectiveness vary for different population groups in terms of encouraging and supporting physical activity? In particular, does this vary for those groups who are less able to be physically active, and if so how?	
Context and objectives	To determine any variation in the effectiveness and cost effectiveness of transport interventions (such as the planning and provision of walking and cycling routes, prioritising the needs of active transport users and the provision of public transport) between different population groups, in particular for groups who are less able to be physically active.	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies	• If there is a large number of includes for the question, evidence may be prioritised, where available, by study design (e.g. RCTs prioritised over

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation • Cost-consequence	observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be included – papers

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		reporting costs only will be excluded.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	Interventions which prioritise the needs of pedestrians, cyclists and users of other modes of active transport, including: • re-allocating road space to support physically active modes of transport such as cycling and walking e.g. shared road space • interventions that enable people with restricted mobility to be physically active by ensuring their local environments are accessible and can be used by all groups e.g. road crossing times, introduction/improvement of pedestrian crossings • planning and providing walking and cycling networks (such as Connect2), infrastructure links with existing networks and facilities e.g. signed only and segregated walking/cycle paths, wayfinding networks/signage, on-street cycle parking • public transport provision, networks, links and facilities (e.g. cycle parking) • parking restrictions and charges e.g. controlled parking zones, parking charges, waiting and loading restrictions • traffic-calming measures to restrict vehicle speeds e.g. sign only speed limits, physical interventions such as road humps and speed cushions • speed restrictions	The following interventions will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks.

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• road-user charging schemes e.g. congestion zones, local emission zones (LEZs) • temporary road closures e.g. ciclovia, 'School Streets' • Other named interventions e.g. 'Cycling Cities', 'Walking Cities'	• Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself. • Re traffic calming, speed cushions and speed restrictions to be aware that may be overlap with PH31 and PH29
Comparator(s)/control	Comparators that will be considered are: • Other intervention • Status quo Time (before and after) or area (i.e. matched city a vs b) comparisons	
Outcome(s)	The following outcomes will be considered when assessing variation in factors such as age, disability, special needs: Primary outcomes: • total physical activity (as measured by e.g. time/distance/number of steps/levels of activity/levels of recommended PA) • total sedentary time (as measured by time)	• Included studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Domain-specific physical activity levels (active travel or physical activity in everyday life (such as measures of walking, cycling or active play)). • public transport use (as a proxy measure of physical activity) according to factors such as age disability special needs etc Secondary outcomes: • car use according to factors such as age, disability, special needs etc	evidence tables and forwarded on to EMU for economic modelling and not for the purposes of this review.

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Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 3	Are there any adverse or unintended effects of transport interventions in terms of (1) physical activity and (2) other aspects of health and wellbeing? a. Do these vary for different population groups, in particular those who are less able to be physically active? b. How can the effects of any unintended or adverse effects be minimised?	
Context and objectives	To determine if transport interventions which encourage and support physical activity have any unintended or adverse effects in all groups, particularly in those groups that are less able to be physically active.	

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation • Cost-consequence Qualitative studies: • Focus groups • Interviews	• If there is a large number of includes for the question, effectiveness evidence may be prioritised, where available, by study design (e.g. RCTs prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be included – papers reporting costs only will be excluded. Only qualitative studies from the UK which provide insight into the unintended consequences or adverse effects of specific interventions and how these vary by population group will be included. Studies will be limited to the UK (rather than EU/OECD countries as for effectiveness studies) as the context (national legislation, local government structures

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		and powers etc) will be particularly relevant here. Qualitative studies which are linked to interventions identified through reviews 1 and 2 may be prioritised if the volume of studies is high. This would be agreed with PHAC.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	Interventions which prioritise the needs of pedestrians, cyclists and users of other modes of active transport, including: • re-allocating road space to support physically active modes of transport such as cycling and walking e.g. shared road space • interventions that enable people with restricted mobility to be physically active by ensuring their local environments are accessible and can be used by all groups e.g. road crossing times, introduction/improvement of pedestrian crossings	The following interventions will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• planning and providing walking and cycling networks (such as Connect2), infrastructure links with existing networks and facilities e.g. signed only and segregated walking/cycle paths, wayfinding networks/signage, on-street cycle parking • public transport provision, networks, links and facilities (e.g. cycle parking) • parking restrictions and charges e.g. controlled parking zones, parking charges, waiting and loading restrictions • traffic-calming measures to restrict vehicle speeds e.g. sign only speed limits, physical interventions such as road humps and speed cushions • speed restrictions • road-user charging schemes e.g. congestion zones, local emission zones (LEZs) • temporary road closures e.g. ciclovia, 'School Streets' • Other named interventions e.g. 'Cycling Cities', 'Walking Cities'	behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are: • Other intervention • Status quo Time (before and after) or area (i.e. matched city a vs b) comparisons	
Outcome(s)	From comparative studies	• Included studies should have an

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	Indicators of physical activity and variation in these according to factors such as age, disability, special needs: • decrease in total physical activity • increase in total sedentary time • decrease in domain-specific physical activity levels • decrease in public transport use (as a proxy measure of physical activity) Other aspects of health and wellbeing and variation in these according to factors such as age, disability, special needs, including: • Rates/numbers of accidents, injuries or fatalities e.g. road traffic accidents, falls <u>From qualitative studies</u> Adverse/unintended effects of interventions in terms of: • Intentions to be physically active • Perceptions (such as barriers, stigma, safety, isolation, feeling of exclusion, lack of sense of belonging and connectedness, increased fear of crime)	indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU for economic modelling and not for the purposes of this review.

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Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 4	What factors relating to transport interventions to encourage and support physical activity, ensure that interventions are acceptable to all groups, including those less able to be physically active?	
Context and objectives	To identify any factors relating to transport interventions that may facilitate the uptake of opportunities to be physically active or conversely prevent uptake of those opportunities. In particular to identify factors which may facilitate uptake by one group but in doing so create barriers for others.	
Types of study to be included/excluded	Inclusions: Qualitative studies: • Focus groups • Interviews	Exclusions: • All quantitative studies • Systematic reviews will only be included as a source for primary evidence. Only qualitative studies from the UK which provide insight into the unintended consequences or adverse effects of specific interventions and how these vary by population group will be included. Studies will be limited to the UK (rather than EU/OECD countries as for effectiveness studies) as the context (national

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		legislation, local government structures and powers etc) will be particularly relevant here. Qualitative studies which are linked to interventions identified through reviews 1 and 2 may be prioritised if the volume of studies is high. This would be agreed with PHAC.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	Interventions which prioritise the needs of pedestrians, cyclists and users of other modes of active transport, including: • re-allocating road space to support physically active modes of transport such as cycling and walking e.g. shared road space • interventions that enable people with restricted mobility to be physically active by ensuring their local environments are accessible and can be used by all groups e.g. road crossing times, introduction/improvement of pedestrian crossings • planning and providing walking and cycling networks (such as Connect2), infrastructure links with existing networks and	The following interventions will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	facilities e.g. signed only and segregated walking/cycle paths, wayfinding networks/signage, on-street cycle parking • public transport provision, networks, links and facilities (e.g. cycle parking) • parking restrictions and charges e.g. controlled parking zones, parking charges, waiting and loading restrictions • traffic-calming measures to restrict vehicle speeds e.g. sign only speed limits, physical interventions such as road humps and speed cushions • speed restrictions • road-user charging schemes e.g. congestion zones, local emission zones (LEZs) • temporary road closures e.g. ciclovia, 'School Streets' • Other named interventions e.g. 'Cycling Cities', 'Walking Cities'	behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are: • Other intervention • Status quo Time (before and after) or area (i.e. matched city a vs b) comparisons	
Outcome(s)	• Intentions (e.g. to be physically active) • Perceptions (e.g. feelings of inclusion, increased sense of belonging and connectedness, increased sense of safety, reduced fear of crime)	

Topic 1	Transport interventions in the built or natural environment	
Component of protocol	Description	Additional comments
	• Preferences (e.g. for different modes of transport) • Knowledge / Attitudes / beliefs (e.g. of interventions) • Acceptability of interventions	

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Topic 1	Transport interventions in the built or natural environment	
Component of protocol	Description	Additional comments
Review question 5	Who needs to be involved to ensure that transport interventions are effective and cost-effective for everyone in encouraging and supporting them to be physically active (including those less able to be physically active)?	
Context and objectives	To determine what the key characteristics of the people involved in the development and delivery of transport interventions (e.g. job roles and competencies) are which affect an intervention's effectiveness and cost effectiveness.	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation	• If there is a large number of includes for the question, effectiveness evidence may be prioritised, where available, by study design (e.g. RCTs prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Cost-consequence Qualitative studies: • Focus groups • Interviews	population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be included – papers reporting costs only will be excluded. Only qualitative studies from the UK which provide insight into the

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		unintended consequences or adverse effects of specific interventions and how these vary by population group will be included. Studies will be limited to the UK (rather than EU/OECD countries as for effectiveness studies) as the context (national legislation, local government structures and powers etc) will be particularly relevant here. Qualitative studies which are linked to interventions identified through reviews 1 and 2 may be prioritised if the volume of studies is high. This would be agreed with PHAC.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people	

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	Interventions which prioritise the needs of pedestrians, cyclists and users of other modes of active transport, including: • re-allocating road space to support physically active modes of transport such as cycling and walking e.g. shared road space • interventions that enable people with restricted mobility to be physically active by ensuring their local environments are accessible and can be used by all groups e.g. road crossing times, introduction/improvement of pedestrian crossings • planning and providing walking and cycling networks (such as Connect2), infrastructure links with existing networks and facilities e.g. signed only and segregated walking/cycle paths, wayfinding networks/signage, on-street cycle parking • public transport provision, networks, links and facilities (e.g. cycle parking) • parking restrictions and charges e.g. controlled parking zones, parking charges, waiting and loading restrictions • traffic-calming measures to restrict vehicle speeds e.g. sign only speed limits, physical interventions such as road humps and speed cushions • speed restrictions • road-user charging schemes e.g. congestion zones, local emission zones (LEZs) • temporary road closures e.g. ciclovia, 'School Streets' • Other named interventions e.g. 'Cycling Cities', 'Walking Cities'	The following interventions will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		the environment rather than changes to the physical environment itself. • Re traffic calming, speed cushions and speed restrictions to be aware that may be overlap with PH31 and PH29
Comparator(s)/control	Comparators that will be considered are: • Other interventions • Status quo/do nothing/control • Time (before and after) or area (i.e. matched city a vs b) comparisons	
Outcome(s)	The outcomes that will be considered when assessing the impact on physical activity are: Primary outcomes: • total physical activity (as measured by e.g. time/distance/number of steps/levels of activity/levels of recommended PA) • total sedentary time (as measured by time) • Domain-specific physical activity levels (active travel or physical activity in everyday life (such as measures of walking, cycling or active play)) • public transport use (as a proxy measure of physical activity) Secondary outcomes:	• Included effectiveness studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU for economic modelling and not for

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• changes to road environment e.g. introduction of traffic calming measures • changes to transport (such as changes in modal share) • vehicle speeds • car use Qualitative outcomes: • Perceptions (e.g. of the key characteristics of the people involved in the development and delivery of transport interventions which make them effective) • Preferences (e.g. for the person delivering the intervention) Descriptive outcomes: • Key characteristics of the people involved in the development and delivery of transport interventions which make them effective e.g. job roles, competencies	the purposes of this review.

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Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 6	Which interventions related to the design and accessibility of public open spaces are effective and cost-effective at encouraging and supporting physical activity in all population groups, including those less able to be physically active?	

[1] Public open spaces in the built and natural environment include open urban spaces (such as the external areas of buildings and open 'grey' space e.g. urban squares and pedestrianised areas), green spaces (such as urban parks, open green areas, woods and forests, coastland and countryside, and paths and routes connecting them) and blue spaces (including the sea, lakes, rivers and canals).

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
Context and objectives	To determine the effectiveness and cost effectiveness of interventions that focus on the design and accessibility of public open spaces (such as access by public transport, on foot, by bicycle and using other modes of physically active transport and through ensuring open spaces are managed maintained safe and welcoming to everyone), which may result in: • supporting and encouraging people to build physical activity into their daily lives • increasing opportunities for, and uptake of, formal or informal recreational activity • reducing sedentary time • increasing the opportunity for, and uptake of, active travel such as walking or cycling (including the use of adapted cycles)	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation	• If there is a large number of includes for the question, evidence may be prioritised, where available, by study design (e.g. RCTs prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different population groups, in

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Cost-consequence	particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be included – papers reporting costs only will be excluded.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people	

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	• Access to open spaces by public transport, on foot, by bicycle or using other forms of active transport (such as Connect2) • Connections between open spaces through traffic-free networks of footpaths, trails or cycle routes (such as green corridors) • Maintenance and management, conservation or landscaping of open spaces • Facilities in open spaces such as accessible toilets, shelter, signage, accessible parking • Safety of open spaces, for example through layout, lighting or security • Regeneration projects • Street and neighbourhood design • Named interventions that involve changes to the design and accessibility of public open spaces, such as Healthy Towns/Healthy New Towns, Age Friendly Cities, Urban 40 project, Olympic parks, Pocket Parks, Play Streets, Healthy Streets	The following interventions related to the design and accessibility of public open spaces will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
		cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are: • Other intervention • Status quo Time (before and after) or area (i.e. matched area a vs b)	
Outcome(s)	The outcomes that will be considered when assessing the impact on physical activity are: Primary outcomes: • total physical activity (as measured by e.g. time/distance/number of steps/levels of activity/levels of recommended PA) • total sedentary time (as measured by time) Domain-specific physical activity levels (active travel or physical activity in everyday life (such as measures of walking, cycling or active play)). • public transport use (as a proxy measure of physical activity) Intermediate outcomes: • changes to urban planning	• Included studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU for economic modelling and not for the purposes of this review.

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• changes to transport (such as changes in modal share) • changes to the infrastructure for both green and blue spaces • access to and use of natural environment including green and blue space • access to grey space	

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Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 7	Does the effectiveness and cost effectiveness of interventions related to the design and accessibility of public open spaces vary for different population groups in terms of encouraging and supporting physical activity? In particular, does this vary for those groups who are less able to be physically active, and if so how?	
Context and objectives	To determine any variation in the effectiveness and cost effectiveness of interventions related to the design and accessibility of public open spaces, between different population groups, in particular for groups who are less able to be physically active.	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies	• If there is a large number of includes for the question, evidence may be prioritised, where available, by study design (e.g. RCTs

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation • Cost-consequence	prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
		included – papers reporting costs only will be excluded.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	• Access to open spaces by public transport, on foot, by bicycle or using other forms of active transport (such as Connect2) • Connections between open spaces through traffic-free networks of footpaths, trails or cycle routes (such as green corridors) • Maintenance and management, conservation or landscaping of open spaces • Facilities in open spaces such as accessible toilets, shelter, signage, accessible parking • Safety of open spaces, for example through layout, lighting or security • Regeneration projects • Street and neighbourhood design • Named interventions that involve changes to the design and accessibility of public open spaces, such as Healthy Towns/Healthy New Towns, Age Friendly Cities, Urban 40 project, Olympic parks, Pocket Parks, Play Streets, Healthy Streets	The following interventions related to the design and accessibility of public open spaces will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
		environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are: • Other intervention • Status quo Time (before and after) or area (i.e. matched area a vs b)	
Outcome(s)	The following outcomes will be considered when assessing variation in factors such as age, disability, special needs: Primary outcomes: • total physical activity (as measured by e.g. time/distance/number of steps/levels of activity/levels of recommended PA) • total sedentary time (as measured by time)	• Included studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Domain-specific physical activity levels (active travel or physical activity in everyday life (such as measures of walking, cycling or active play)). • public transport use (as a proxy measure of physical activity) according to factors such as age disability special needs etc Secondary outcomes: • access to and use of natural environment including green and blue space and variation in this according to factors such as age, disability, special needs • access to grey space and variation in this according to factors such as age, disability, special needs	for economic modelling and not for the purposes of this review.

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Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 8	Are there any adverse or unintended effects of interventions related to the design and accessibility of public open spaces in terms of (1) physical activity and (2) other aspects of health and wellbeing? a. Do these vary for different population groups, in particular those who are less able to be physically active? b. How can the effects of any unintended or adverse effects be minimised?	

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
Context and objectives	To determine if interventions related to the design and accessibility of public open spaces have any adverse or unintended effects, in all groups and particularly in those groups that are less able to be physically active.	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies • Case-control studies Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation • Cost-consequence Qualitative studies: • Focus groups • Interviews	• If there is a large number of includes for the question, effectiveness evidence may be prioritised, where available, by study design (e.g. RCTs prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
		included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence. • Only full economic analyses will be included – papers reporting costs only will be excluded. Only qualitative studies from the UK which provide insight into the unintended consequences or adverse effects of specific interventions and how these vary by population group will be included. Studies will be limited to the UK (rather than EU/OECD countries as

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
		for effectiveness studies) as the context (national legislation, local government structures and powers etc) will be particularly relevant here. Qualitative studies which are linked to interventions identified through reviews 1 and 2 may be prioritised if the volume of studies is high. This would be agreed with PHAC.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	• Access to open spaces by public transport, on foot, by bicycle or using other forms of active transport (such as Connect2) • Connections between open spaces through traffic-free networks of footpaths, trails or cycle routes (such as green corridors) • Maintenance and management, conservation or landscaping of open spaces	The following interventions related to the design and accessibility of public open spaces will not be included:

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Facilities in open spaces such as accessible toilets, shelter, signage, accessible parking • Safety of open spaces, for example through layout, lighting or security • Regeneration projects • Street and neighbourhood design • Named interventions that involve changes to the design and accessibility of public open spaces, such as Healthy Towns/Healthy New Towns, Age Friendly Cities, Urban 40 project, Olympic parks, Pocket Parks, Play Streets, Healthy Streets	• Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are:	

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Other intervention • Status quo Time (before and after) or area (i.e. matched area a vs b)	
Outcome(s)	<u>From comparative studies</u> Indicators of physical activity and variation in these according to factors such as age, disability, special needs: • decrease in total physical activity • increase in total sedentary time • decrease in domain-specific physical activity levels • decrease in public transport use (as a proxy measure of physical activity) Other aspects of health and wellbeing and variation in these according to factors such as age, disability, special needs, including: • Rates/numbers of accidents, or injuries or fatalities e.g. road traffic accidents, falls <u>From qualitative studies</u> Adverse/unintended effects of interventions in terms of: • Intentions to be physically active • Perceptions (such as barriers, stigma, safety, isolation, feeling of exclusion, lack of sense of belonging and connectedness, increased fear of crime) •	• Included studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU for economic modelling and not for the purposes of this review.

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Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 9	What factors relating to interventions which focus on the design and accessibility of public open spaces ensure that interventions are acceptable to all groups, including those less able to be physically active?	
Context and objectives	To identify any factors relating to the design and accessibility of public open spaces, that may facilitate the uptake of opportunities to be physically active or conversely prevent uptake of those opportunities. In particular to identify factors which may facilitate uptake by one group but in doing so create barriers for others.	
Types of study to be included/excluded	Inclusions: Qualitative studies: • Focus groups • Interviews	Exclusions: • All quantitative studies • Systematic reviews will only be included as a source for primary evidence. Only qualitative studies from the UK which provide insight into the unintended consequences or adverse effects of specific interventions and how these vary by population group will be included. Studies will be limited to the UK (rather than EU/OECD countries as

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
		for effectiveness studies) as the context (national legislation, local government structures and powers etc) will be particularly relevant here. Qualitative studies which are linked to interventions identified through reviews 1 and 2 may be prioritised if the volume of studies is high. This would be agreed with PHAC.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	• Access to open spaces by public transport, on foot, by bicycle or using other forms of active transport (such as Connect2) • Connections between open spaces through traffic-free networks of footpaths, trails or cycle routes (such as green corridors) • Maintenance and management, conservation or landscaping of open spaces	The following interventions related to the design and accessibility of public open spaces will not be included:

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Facilities in open spaces such as accessible toilets, shelter, signage, accessible parking • Safety of open spaces, for example through layout, lighting or security • Regeneration projects • Street and neighbourhood design • Named interventions that involve changes to the design and accessibility of public open spaces, such as Healthy Towns/Healthy New Towns, Age Friendly Cities, Urban 40 project, Olympic parks, Pocket Parks, Play Streets, Healthy Streets	• Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks. • Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are:	

Topic 2	**Design and accessibility of public open spaces[1] in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Other intervention • Status quo • Time (before and after) or area (i.e. matched area a vs b)	
Outcome(s)	• Intentions (e.g. to be physically active) • Perceptions (e.g. feelings of inclusion, increased sense of belonging and connectedness, increased sense of safety, reduced fear of crime) • Knowledge / Attitudes / beliefs (e.g. of interventions) • Acceptability of interventions	

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Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
Review question 10	Who needs to be involved to ensure that interventions related to the design and accessibility of public open spaces are effective and cost-effective for everyone in encouraging and supporting them to be physically active, including those less able to be physically active?	
Context and objectives	To determine what the key characteristics of the people involved in the design and accessibility of public open spaces (e.g. job roles and competencies) are which affect an intervention's effectiveness and cost effectiveness.	
Types of study to be included/excluded	Inclusions: Comparative studies including: • Randomised or non-randomised controlled trials • Before and after studies • Cohort studies	• If there is a large number of includes for the question, effectiveness evidence may be prioritised, where

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• Case-control studies Economic studies: • Economic evaluations • Cost-utility (cost per QALY) • Cost benefit (i.e. Net benefit) • Cost-effectiveness (Cost per unit of effect) • Cost minimisation • Cost-consequence Qualitative studies: • Focus groups • Interviews	available, by study design (e.g. RCTs prioritised over observational studies) in consultation with PHAC. Where there is a lack of higher quality evidence for different population groups, in particular those who are less able to be physically active, a lower quality of evidence may be considered. • It is unlikely that cross-sectional and other surveys will be included in the review unless there is an absence of other evidence. This will be agreed with PHAC as appropriate. • Systematic reviews will only be used as a source for primary evidence.

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		• Only full economic analyses will be included – papers reporting costs only will be excluded. Only qualitative studies from the UK which provide insight into the unintended consequences or adverse effects of specific interventions and how these vary by population group will be included. Studies will be limited to the UK (rather than EU/OECD countries as for effectiveness studies) as the context (national legislation, local government structures and powers etc) will be particularly relevant here. Qualitative studies which are linked to interventions identified through reviews 1 and 2 may be prioritised if the volume of

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		studies is high. This would be agreed with PHAC.
Participants/population	Whole population (adults and children) with particular consideration of groups who are less able to be physically active including: • Older people • People with disabilities including mental, physical, sensory and learning impairments which impact on their ability to be physically active	
Intervention(s)	• Access to open spaces by public transport, on foot, by bicycle or using other forms of active transport (such as Connect2) • Connections between open spaces through traffic-free networks of footpaths, trails or cycle routes (such as green corridors) • Maintenance and management, conservation or landscaping of open spaces • Facilities in open spaces such as accessible toilets, shelter, signage, accessible parking • Safety of open spaces, for example through layout, lighting or security • Regeneration projects • Street and neighbourhood design • Named interventions that involve changes to the design and accessibility of public open spaces, such as Healthy Towns/Healthy New Towns, Age Friendly Cities, Urban 40 project, Olympic parks, Pocket Parks, Play Streets, Healthy Streets	The following interventions will not be included: • Interventions to increase physical activity as part of managing chronic or other conditions. • Interventions that aim to change individual behaviour by providing and encouraging people to take up activities that take place in the built or natural environment e.g. exercise classes, green gyms and organised walks.

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
		• Interventions covered by PH41 (walking and cycling) which covers the design, deliver and promotion of interventions within the environment rather than changes to the physical environment itself.
Comparator(s)/control	Comparators that will be considered are: • Other interventions • Status quo/do nothing/control • Time (before and after) or area (i.e. matched city a vs b) comparisons	
Outcome(s)	The outcomes that will be considered when assessing the impact on physical activity are: Primary outcomes: • total physical activity (as measured by e.g. time/distance/number of steps/levels of activity/levels of recommended PA) • total sedentary time (as measured by time) • Domain-specific physical activity levels (active travel or physical activity in everyday life (such as measures of walking, cycling or active play)) • public transport use (as a proxy measure of physical activity) Secondary outcomes:	• Included effectiveness studies should have an indicator of physical activity reported. • Included studies reporting any health outcomes will be noted in EPPI/the evidence tables and forwarded on to EMU for economic modelling and not for

Topic 1	**Transport interventions in the built or natural environment**	
Component of protocol	Description	Additional comments
	• changes to urban planning • changes to transport (such as changes in modal share) • changes to the infrastructure for both green and blue spaces • access to and use of natural environment including green and blue space • access to grey space Qualitative outcomes: • Perceptions (e.g. of the key characteristics of the people involved in the development and delivery of transport interventions which make them effective) • Preferences (e.g. for the person delivering the intervention) Descriptive outcomes: • Key characteristics of the people involved in the design and accessibility of public open spaces which make them effective e.g. job roles, competencies	the purposes of this review.

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3. Quality Appraisal Checklists

QA EPOC Checklist for RCTs, non-randomised controlled trials and controlled before-after studies

Administrative details

Study name or author and year **[Type study name, or author and year (include letter if more than 1 paper with the same author and year, e.g. 'Smith 2010a')]**	**STAR ID** **[Type STAR ID]**
Citation **[Include citation details – usually authors, title of study, journal details, year]**	
Linked studies (study name or author, year, STAR ID) **[Include study name or author, year and STAR ID of any related studies, or state 'None']**	
Final study quality score **[Click to choose the final quality score. See 'Calculation of final study quality score' below for details on how to complete this.]**	
Date of QA **[Click to choose the date the QA was completed]**	**Reviewer(s) names** **[Type name of the reviewer/reviewers completing the quality assessment]**

Calculation of final study quality score (from box 6.1 on page 95 of the NICE Guidelines Manual)

- **++** All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter.
- **+** Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or are not adequately described, the conclusions are unlikely to alter.
- **-** Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

Quality Assessment

For all questions:

++	'Yes'	The study full meets the criterion.
+	'Partly'	The study largely meets the criterion but differs in some important respect.
-	'No'	The study deviates substantially from the criterion.
	'Unclear'	Report provides insufficient information to judge whether the study complies with the criterion.
	'NA (not applicable'	The criterion is not relevant in this particular instance.

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Item	Decision	Comments
1. Was the allocation sequence adequately generated?	[Click here to choose a decision. ++ if a random component in the sequence generation process is described (e.g. a random number table), - if a non-random method is used (e.g. date of admission) or if study is a non-randomised controlled trial or controlled before-after study]	[State how the allocation sequence was generated.]
2. Was the allocation adequately concealed?	[Click here to choose a decision. ++ if allocation by institution, team or professional and allocation performed on all units at start of the study, or if the unit of allocation was by patient or episode of care and there was a centralised randomisation scheme (on-site computer system or sealed opaque envelopes). – if controlled before-after study.]	[State how the allocation was concealed.]
3. Were baseline outcome measurements similar?	[Click here to choose a decision.++ if performance or patient outcomes were measured prior to intervention and no important differences present across study groups. In RCTs score ++ if imbalanced but appropriate adjusted analysis was performed (e.g. analysis of covariance). Score - if important differences were present and not adjusted for in analysis.]	[State whether the baseline outcome measurements were similar.]
4. Were baseline characteristics similar?	[Click here to choose a decision. ++ if baseline characteristics of the study and control providers are	[State whether the baseline characteristics were similar.]

	reported and similar. Score - if there is no report of characteristics or if there are differences between control and intervention providers.]	
5. Were incomplete outcome data adequately addressed?	[Click here to choose a decision. ++ if missing outcome measures were unlikely to bias the results (e.g. the proportion of missing data was similar in the intervention and control groups or the proportion of missing data was less than the effect size i.e. unlikely to overturn the study result). Score - if missing outcome data was likely to bias the results.]	[State whether incomplete outcome data were adequately addressed.]
6. Was knowledge of the allocated interventions adequately prevented during the study?	[Click here to choose a decision. ++ if the authors state explicitly that primary outcome variables were assessed blindly, or outcomes are objective, e.g. length of hospital stay. Score - if primary outcomes were not assessed blindly.]	[State whether knowledge of the allocated interventions was adequately prevented during the study.]
7. Was the study adequately protected against contamination?	[Click here to choose a decision. ++ if allocation by community, institution or practice and it is unlikely that the control group received the intervention. Score - if it is likely that the control group received the intervention (e.g. if patients rather than professionals were randomised). Score “unclear” if professionals were allocated within a clinic or practice and it is possible that communication between intervention and control professionals could have occurred (e.g. physicians within practices	[State whether the study was adequately protected against contamination.]

	were allocated to intervention or control).]	
8. Was the study free from selective outcome reporting?	[Click here to choose a decision. ++ if there is no evidence that outcomes were selectively reported (e.g. all relevant outcomes in the methods section are reported in the results section). Score - if some important outcomes are subsequently omitted from the results.]	[State whether the study was free from selective outcome reporting.]
9. Was the study free from other risks of bias?	[Click here to choose a decision. Score ++ if there is no evidence of other risk of biases.]	[State whether the study was free from other risks of bias.]

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QA EPHPP Checklist for uncontrolled before and after studies (EPHPP)

Administrative details

Study name or author and year **[Type study name, or author and year (include letter if more than 1 paper with the same author and year, e.g. 'Smith 2010a')]**	***STAR ID*** **[Type STAR ID]**
Citation **[Include citation details – usually authors, title of study, journal details, year]**	
Linked studies (study name or author, year, STAR ID) **[Include study name or author, year and STAR ID of any related studies, or state 'None']**	
Final study quality score **[Click to choose the final quality score. See 'Calculation of final study quality score' below for details on how to complete this.]**	
Date of QA **[Click to choose the date the QA was completed]**	***Reviewer(s) names*** **[Type name of the reviewer/reviewers completing the quality assessment]**

Calculation of final study quality score (from EPHPP tool http://www.ephpp.ca/PDF/Quality%20Assessment%20Tool_2010_2.pdf)

- **++** Strong. No weak ratings.
- **+** Moderate. One weak rating.
- **-** Weak. Two or more weak ratings.

Quality Assessment

Item	*Component Rating*	*Section Rating*	*Comments*
Selection bias			

1. Are the individuals selected to participate in the study likely to be representative of the target population?	[Click here to choose a rating. Score 'very likely' if randomly selected from a comprehensive list of individuals in target population, 'somewhat likely' if referred from a source (e.g. clinic) in a systematic manner, 'not likely' if self-referred.]	[Click here to choose a decision. 'Strong' if Q1 is 'very likely' and Q2 is 80 to 100%. 'Moderate' if Q1 is 'very likely' or 'somewhat likely' and Q2 is 60 or 79% or 'can't tell'. 'Weak' if Q1 is 'not likely' or 'can't tell' and Q2 is 'can't tell'.]	[Add comments if necessary.]
2. What percentage of selected individuals agreed to participate?	[Click here to choose a rating.]		
Study design			
3. What is the study design?	[Click here to choose a rating.]	[Click here to choose a decision. 'Strong' if RCT or CCT, 'moderate' if cohort analytic study, case control study, a cohort design, or interrupted time series, 'weak' for any other method or did not state method used.]	[Add comments if necessary, including description of study design if 'other'.]
4. Was the study described as randomised?	[Click here to choose a rating. If 'no', mark questions 5 and 6 as 'not applicable' and go straight to 'Confounders' section.]		
5. Was the method of randomisation described?	[Click here to choose a rating.]		
6. Was the method of randomisation appropriate?	[Click here to choose a rating.]		
Confounders			
7. Were there important differences between groups prior to the intervention?	[Click here to choose a rating. Example of confounders include race, sex, marital status/family, age, socioeconomic status, education, health status, pre-intervention score on outcome measure.]	[Click here to choose a decision. 'Strong' if Q7 is 'no' or Q2 is 80% or more. 'Moderate' if Q7 is 'yes' and Q8 is 60 to 79%. 'Weak' if Q7 is 'yes' and Q8 is less than 60%, or if Q7 is 'cant' tell' and Q8 is 'can't tell'.]	[Add comments if necessary.]
8. If yes, what percentage of relevant confounders were controlled (either in the design [e.g. stratification, matching] or analysis)?	[Click here to choose a rating.]		
Blinding			

9. Was/were the outcome assessor/s aware of the intervention or exposure status of participants?	[Click here to choose a rating.]	[Click here to choose a decision. 'Strong' if Q9 is 'no' and Q10 is 'no'. 'Moderate' if Q9 is 'no' or Q10 is 'no', or Q9 is 'can't tell' and Q10 is 'can't tell'. 'Weak' if Q9 is 'yes' and Q10 is 'yes'.]	[Add comments if necessary.]
10. Were the study participants aware of the research question?	[Click here to choose a rating.]		
Data collection methods			
11. Were data collection tools shown to be valid?	[Click here to choose a rating.]	[Click here to choose a decision. 'Strong' if Q11 is 'yes' and Q12 is 'yes'. 'Moderate' if Q11 is 'yes' and Q12 is 'no' or Q12 is 'can't tell'. 'Weak' if Q11 is 'no' or Q11 is 'can't tell' and Q12 is 'can't tell'.]	[Add comments if necessary.]
12. Were data collection tools shown to be reliable?	[Click here to choose a rating.]		
Withdrawals and drop-outs			
13. Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	[Click here to choose a rating.]	[Click here to choose a decision. 'Strong' if Q14 is 80% or more. 'Moderate' if Q14 is 60 to 79% or 'not applicable'. 'Weak' if Q14 is less than 60% or 'can't tell'.]	[Add comments if necessary.]
14. What percentage of participants completed the survey?	[Click here to choose a rating. If percentage differs by groups, record the lowest.]		
Intervention integrity			
15. What percentage of participants received the allocated intervention or exposure of interest?	[Click here to choose a rating. If percentage differs by groups, record the lowest.]	Section rating not required.	[Add comments if necessary.]
16. Was the consistency of the intervention measured?	[Click here to choose a rating.]		
17. Is it likely that subjects received an	[Click here to choose a rating.]		

unintended intervention (contamination or co-intervention) that may influence the results?			
Analyses			
18. What is the unit of allocation?	[Click here to choose a rating.]	Section rating not required.	[Add comments if necessary. Add details if 'other' selected for question 18 and/or 19.]
19. What is the unit of analysis?	[Click here to choose a rating.]		
20. Are the statistical methods appropriate for the study design?	[Click here to choose a rating.]		
21. Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?	[Click here to choose a rating.]		

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Methodology checklist: Qualitative studies

Study identification	
Guidance topic:	**Key research question/aim:**
Checklist completed by:	

Theoretical approach		
1. Is a qualitative approach appropriate? *For example,* • Does the research question seek to understand processes or structures, or illuminate subjective experiences or meanings? • Could a quantitative approach better have addressed the research question?	Choose an item.	Comments:
2. Is the study clear in what it seeks to do? *For example,* • Is the purpose of the study discussed – aims/objectives/research question/s? • Is there adequate/appropriate reference to the literature? • Are underpinning values/assumptions/theory discussed?	Choose an item.	Comments:

Study design		
3. How defensible/rigorous is the research design/methodology? *For example,* • Is the design appropriate to the research question? • Is a rationale given for using a qualitative approach? • Are there clear accounts of the rationale/justification for the sampling, data collection and data analysis techniques used? • Is the selection of cases/sampling strategy theoretically justified?	Choose an item.	Comments:

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Data collection		
4. How well was the data collection carried out? *For example,* • Are the data collection methods clearly described? • Were the appropriate data collected to address the research question? • Was the data collection and record keeping systematic?	Choose an item.	Comments:

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Trustworthiness		
5. Is the role of the researcher clearly described? *For example,* • Has the relationship between the researcher and the participants been adequately considered? • Does the paper describe how the research was explained and presented to the participants?	Choose an item.	Comments:
6. Is the context clearly described? *For example,* • Are the characteristics of the participants and settings clearly defined? • Were observations made in a sufficient variety of circumstances? • Was context bias considered?	Choose an item.	Comments:
7. Were the methods reliable? *For example,* • Was data collected by more than one method? • Is there justification for triangulation, or for not triangulating? • Do the methods investigate what they claim to?	Choose an item.	Comments:

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Analysis		
8. Is the data analysis sufficiently rigorous? *For example,* • Is the procedure explicit – i.e. is it clear how the data was analysed to arrive at the results? • How systematic is the analysis, is the procedure reliable/dependable? • Is it clear how the themes and concepts were derived from the data?	Choose an item.	Comments:
9. Is the data 'rich'? *For example,* • How well are the contexts of the data described? • Has the diversity of perspective and content been explored? • How well has the detail and depth been demonstrated? • Are responses compared and contrasted across groups/sites?	Choose an item.	Comments:
10. Is the analysis reliable? *For example,* • Did more than one researcher theme and code transcripts/data? • If so, how were differences resolved? • Did participants feed back on the transcripts/data if possible and relevant? • Were negative/ discrepant results addressed or ignored?	Choose an item.	Comments:
11. Are the findings convincing? *For example,* • Are the findings clearly presented? • Are the findings internally coherent? • Are extracts from the original data included? • Is the data appropriately referenced? • Is the reporting clear and coherent?	Choose an item.	Comments:
12. Are the findings relevant to the aims of the study?	Choose an item.	Comments:

13. Conclusions *For example,* • How clear are the links between data, interpretation and conclusions? • Are the conclusions plausible and coherent? • Have alternative explanations been explored and discounted? • Does this enhance understanding of the research topic? • Are the implications of the research clearly defined? • Is there adequate discussion of any limitations encountered?	Choose an item.	Comments:

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Ethics		
14. How clear and coherent is the reporting of ethics? *For example,* • Have ethical issues been taken into consideration? • Are they adequately discussed e.g. do they address consent and anonymity? • Have the consequences of the research been considered i.e. raising expectations, changing behaviour etc? • Was the study approved by an ethics committee?	Choose an item.	Comments:
Overall Assessment		
As far as can be ascertained from the paper, how well was the study conducted?	Choose an item.	Comments:

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Quality of Included Studies

Effectiveness Studies

EFFECTIVENESS STUDIES (EPOC Checklist) (N=3)										
Review 1	**Question**									**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Boarnet et al 2013	NA	NA	++	+	++	-	+	++	+	+
Brown et al 2016	NA	NA	Unclear	-	+	NA	-	++	+	-
Loader and Stanley 2009	NA	NA	Unclear	Unclear	NA	Unclear	++	-	Unclear	-

EFFECTIVENESS STUDIES (EPOC Checklist) (N=15)										
Review 2	**Question**									**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Bjornskau et al 2012	NA	NA	Unclear	Unclear	NA	-	-	NA	+	-
Clark et al 2014	NA	NA	-	Unclear	++	++	++	++	+	+
D'Haese et al 2015	NA	NA	+	+	+	++	-	++	-	+
Dill et al 2014	NA	NA	-	+	-	+	+	+	-	-

EFFECTIVENESS STUDIES (EPOC Checklist) (N=15)										
Review 2	**Question**									**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Fitzhugh et al 2010	NA	NA	++	-	NA	+	Unclear	+	++	+
Goodman et al 2013a	NA	NA	+	+	++	-	+	++	+	+
Gustat et al 2012	NA	NA	Unclear	-	NA	Unclear	+	-	+	-
Hoelscher et al 2016	NA	NA	Unclear	+	-	+	+	++	-	-
Krizek et al 2009	NA	NA	-	Unclear	NA	-	+	++	+	-
Orenstein et al 2007 (controlled study)	NA	NA	Unclear	Unclear	++	-	+	+	-	-
Ostergaard et al 2015	NA	NA	-	+	-	-	+	+	++	-
Parker et al 2013	NA	NA	-	+	++	-	+	++	++	-
Rissel et al 2015	NA	NA	Unclear	Unclear	-	Unclear	-	-	-	-
Sloman et al 2009	NA	NA	Unclear	Unclear	NA	-	+	+	++	-
West and Shores 2011	NA	NA	+	-	-	+	-	++	++	-
West and Shores 2015	NA	NA	+	+	+	NA	+	++	+	+

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EFFECTIVENESS STUDIES (EPOC Checklist) (N=14)										
Review 3	**Question**									**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Bohn Goldbaum et al 2013	NA	NA	-	-	NA	-	-	-	++	-
Christian et al 2013	NA	NA	++	++	Unclear	Unclear	+	++	+	+
Chomitz et al 2012	NA	NA	-	-	Unclear	++	+	-	+	-
Cohen et al 2009	NA	NA	+	-	NA	-	Unclear	-	-	-
Cohen et al 2014	NA	NA	-	-	++	-	-	-	++	-
Cohen et al 2015	NA	NA	-	Unclear	++	-	-	-	-	-
Droomers et al 2016	NA	NA	-	Unclear	NA	+	+	+	++	+
Dunton et al 2012	NA	NA	-	++	++	+	+	-	+	+
Norwood et al 2014	NA	NA	-	+	NA	-	+	++	-	-
Quigg Et al 2011	NA	NA	-	+	+	Unclear	-	-	+	-
Slater et al 2016	NA	NA	+	++	++	-	-	-	++	-

EFFECTIVENESS STUDIES (EPOC Checklist) (N=14)										
Review 3	**Question**									**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Tester and Baker 2009	NA	NA	Unclear	++	NA	-	-	+	+	-
Veitch et al 2012	NA	NA	-	+	NA	+	-	+	+	-
Ward Thompson et al 2014	NA	NA	Unclear	+	Unclear	NA	++	-	-	-

U = Unclear NA = Not applicable

Key to questions:

1. Was the allocation sequence adequately generated?
2. Was the allocation adequately concealed?
3. Were baseline outcome measurements similar?
4. Were baseline characteristics similar?
5. Were incomplete outcome data adequately addressed?
6. Was knowledge of the allocated interventions adequately prevented during the study?
7. Was the study adequately protected against contamination?
8. Was the study free from selective outcome reporting?
9. Was the study free from other risks of bias?

247 ***Before and After Studies***

UNCONTROLLED BEFORE AND AFTER STUDIES (EPHPP) (N=13)							
Review 1	**Question**						**Score**
	Selection Bias	**Study Design**	**Confounders**	**Blinding**	**Data Collection Methods**	**Withdrawals and Dropouts**	
Bergman et al 2010	Moderate	Moderate	Strong	Moderate	Moderate	Strong	+
Brockman and Fox, 2011	Moderate	Moderate	NA	Weak	Weak	NA	-
Brown and Werner 2007	Moderate	Weak	Weak	Moderate	Weak	Weak	-
Brown and Werner 2009	Moderate	Moderate	Strong	Moderate	Weak	Weak	-
Brown et al 2015	Weak	Weak	NA	Weak	Moderate	Strong	-
Collins and Agarwal 2015	Weak	Weak	NA	Moderate	Weak	Weak	-
Foley et al 2017	Moderate	Moderate	Weak	Moderate	Weak	Weak	-
Heinen et al 2015	Weak	Moderate	NA	Strong	Weak	Weak	-
Karlstrom and Franklin 2009	Moderate	Moderate	Weak	Weak	Weak	Moderate	-
Miller et al 2015	Weak	Weak	NA	Weak	Moderate	Strong	-
Panter et al 2016	Weak	Moderate	NA	Moderate	Strong	Weak	-
Sharaby and Shiftan 2012	Weak	Moderate	NA	Weak	Weak	Weak	-

UNCONTROLLED BEFORE AND AFTER STUDIES (EPHPP) (N=13)							
Review 1	**Question**						**Score**
	Selection Bias	**Study Design**	**Confounders**	**Blinding**	**Data Collection Methods**	**Withdrawals and Dropouts**	
Transport for London 2008	Moderate	Moderate	NA	Moderate	Weak	NA	+

UNCONTROLLED BEFORE AND AFTER STUDIES (EPHPP) (N=9)							
Review 2	**Question**						**Score**
	Selection Bias	**Study Design**	**Confounders**	**Blinding**	**Data Collection Methods**	**Withdrawals and Dropouts**	
Adams and Cavill 2015	Weak	Moderate	Weak	Moderate	Weak	Strong	-
Goodman et al 2013b	Weak	Moderate	NA	Moderate	Moderate	Weak	-
Goodman et al 2014	Weak	Moderate	NA	Moderate	Moderate	Weak	-
Hendricks et al 2009	Weak	Moderate	NA	Moderate	Weak	NA	-
Hunter et al 2009	Moderate	Moderate	Weak	Moderate	Weak	NA	-
Parker et al 2011	NA	Moderate	NA	Weak	Moderate	NA	-
Poindexter et al 2007	Moderate	Moderate	NA	Strong	Weak	NA	-
Stewart et al 2014	Weak	Moderate	NA	Weak	Weak	Weak	-
Torres et al 2016	Weak	Weak	Weak	Weak	Weak	Moderate	-

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UNCONTROLLED BEFORE AND AFTER STUDIES (EPHPP) (N=6)							
Review 3	**Question**						**Score**
	Selection Bias	**Study Design**	**Confounders**	**Blinding**	**Data Collection Methods**	**Withdrawals and Dropouts**	
Gidlow et al 2010	Weak	Weak	NA	Weak	Weak	Weak	-
King et al 2015	NA	Weak	NA	Moderate	Strong	NA	+
Knuiman et al 2014	Moderate	Moderate	NA	Moderate	Strong	Weak	+
O'Brien and Morris 2009	Weak	Moderate	NA	Weak	Weak	NA	-
Paton-Lopez et al 2015	NA	Weak	NA	Moderate	Weak	Weak	-
Roemmich et al 2014	Weak	Moderate	Weak	Weak	Strong	NA	-

Intervention integrity and **Analyses** are included in the tool but a section rating is not required. Therefore they are not included in this summary.

253 ***Qualitative Studies***

QUALITATIVE STUDIES (N=2)															
Review 1	**Question**														**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
Jones et al 2013	Appropriate	Clear	Defensible	NS	U	Clear	NS	NS	Rich	Reliable	Convincing	Relevant	Adequate	Appropriate	++
Kesten et al 2015	Appropriate	Clear	Defensible	Appropriately	Not described	Clear	NS	Rigorous	Rich	Reliable	Convincing	Relevant	Adequate	Appropriate	++

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QUALITATIVE STUDIES (N=2)															
Review 2	**Question**														**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
Orenstein et al 2007	N	N	N	N	Unclear	Y	Y	N	N	N	N	Y	N	N	-
Sahlqvist et al 2015	Y	Y	Y	Not sure	Unclear	N	Y	Y	Not sure	Y	Y	Y	N	Y	+

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QUALITATIVE STUDIES (N=3)															
Review 3	**Question**														**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
Coulson et al 2011	Y	Y	Y	Y	Unclear	N	Not sure	Y	Y	N	Y	Y	Y	Y	+

QUALITATIVE STUDIES (N=3)															
Review 3	**Question**														**Score**
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
Gidlow Revoiewet al 2010	Y	Y	N	Y	Y	Y	N	N	Y	N	Y	Y	Y	Y	-
Trayers et al 2006	Y	Mixed	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y	+

Key to questions:

1. Is a qualitative approach appropriate?
2. Is the study clear in what it seeks to do?
3. How defensible / rigorous is the research design / methodology?
4. How well was the data collection carried out?
5. Is the role of the researcher clearly described?
6. Is the context clearly described?
7. Were the methods reliable?
8. Is the data analysis sufficiently rigorous?
9. Is the data 'rich'?
10. Is the analysis reliable?
11. Are the findings convincing?
12. Are the findings relevant to the aims of the study?
13. Conclusions
14. How clear and coherent is the reporting of ethics?

NS = Not sure / inadequately reported
U = Unclear

277 # 4. Excluded Studies

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Authors	Title	Reason for exclusion
Aird (2015)	Active aging: Exploration into self-ratings of "being active," out-of-home physical activity, and participation among older australian adults living in four different settings	• EXCLUDE on intervention
Albildso et al, 2012	Assessing the cost effectiveness of a community rail-trail in achieving physical activity gains	• EXCLUDE - unavailable
Anonymous (2015)	Impact of Safe Routes to School programs on walking and biking	• EXCLUDE - study type
Arredondo (2013)	Advocating for environmental changes to increase access to parks: engaging promotoras and youth leaders	• EXCLUDE on outcomes
Audrey (2015)	Healthy urban environments for children and young people: A systematic review of intervention studies	• EXCLUDE relevant systematic review
Aytur (2008)	Urban Containment Policies and Physical Activity. A Time-Series Analysis of Metropolitan Areas, 1990-2002	• EXCLUDE on intervention
Backing the bus (2006)	Backing the bus	• EXCLUDE - study type
Barnes et al., 2006	A longitudinal analysis of the effect of bicycle facilities on commute mode share	• EXCLUDE - duplicate
Bassett (2013)	Estimated energy expenditures for school-based policies and active living	• EXCLUDE on study type
Beale (2012)	Should we invest in environmental interventions to encourage physical activity in England? An economic appraisal	• EXCLUDE on study type
Bicycles 2010 (2010)	Bicycles 2010	• EXCLUDE - unavailable
Boarnet et al (2008)	Walking, Urban Design, and Health Toward a Cost-Benefit Analysis Framework	• EXCLUDE - study type
Boehm (2013)	Transformation of an Urban Corridor	• EXCLUDE no data to extract
Boone-Heinonen et al, 2010	Residential self-selection bias in the estimation of built environment effects on physical activity between adolescence and young adulthood	• EXCLUDE - no data to extract

Brown (2015)	Congestion Pricing and Active Transport - Evidence from Five Opportunities for Natural Experiment	• EXCLUDE - relevant systematic review
Brown (2016)	A systematic review of economic analyses of active transport interventions that include physical activity benefits	• EXCLUDE - relevant systematic review
Bruhova (2012)	Statistical analysis of the impact of policies on active transport in European cities	• EXCLUDE on intervention
Buckley (2013)	Evaluating safe routes to school events that designate days for walking and bicycling	• EXCLUDE on intervention
Burbage (2014)	Building mutually beneficial partnerships to improve physical activity opportunities through shared-use efforts in under-resourced communities in Los Angeles County	• EXCLUDE - out of scope
Burbidge (2008)	Evaluating the Impact of Neighborhood Trail Development on Active Travel Behavior and Overall Physical Activity	• EXCLUDE - out of scope
Burgoyne (2007)	Walking in a city neighbourhood, paving the way	• EXCLUDE - out of scope
Burke (2009)	The Path to Active Living: Physical Activity Through Community Design in Somerville, Massachusetts	• EXCLUDE on outcomes
Calise (2012)	The effect of a neighborhood built environment on physical activity behaviors	• EXCLUDE on intervention
Carlson (2009)	Reducing Auto Congestion Around Schools: Transportation Demand Strategies for Schools Phase II Report	• EXCLUDE on intervention
Carman (2007)	Walking to Maintain and Improve Health: How the Integration of Sidewalks and Walking Paths in Senior Communities Promotes Successful Aging	• EXCLUDE no data to extract
Catacchio (2011)	More Cyclists + Better Design = Safer Roadways	• EXCLUDE - no data to extract
Caulfield (2014)	Re-cycling a City--Examining the Growth of Cycling in Dublin	• EXCLUDE - study type
Cavill (2011)	Cycling demonstration towns: A cost-effective investment to promote physical activity	• EXCLUDE - no data to extract

Cedervall (2010)	Physical activity and implications on well-being in mild Alzheimer's disease: A qualitative case study on two men with dementia and their spouses	• EXCLUDE on country
Chapman (2014)	Increasing active travel: aims, methods and baseline measures of a quasi-experimental study	• EXCLUDE - no data to extract
Chaufan (2012)	The safe routes to school program in California: an update	• EXCLUDE - study type
Cheadle (2010)	Approaches to measuring the extent and impact of environmental change in three California community-level obesity prevention initiatives	• EXCLUDE on study type
Cheadle (2012)	Kaiser Permanente's Community Health Initiative in Northern California: evaluation findings and lessons learned	• EXCLUDE on intervention
Chillon (2011)	A systematic review of interventions for promoting active transportation to school	• EXCLUDE - relevant systematic review
Clark (2010)	Key stakeholder perspectives on the development of walkable neighbourhoods	• EXCLUDE - out of scope
Cleland (2014)	Identifying solutions to increase participation in physical activity interventions within a socio-economically disadvantaged community: A qualitative study	• EXCLUDE on intervention
Cobiac et al 2009	Cost-effectiveness of interventions to promote physical activity: a modelling study	• EXCLUDE - study type
Cohen (2008)	Impact of a new bicycle path on physical activity	• EXCLUDE - no data to extract
Cohen (2012)	Impact and cost-effectiveness of family Fitness Zones: A natural experiment in urban public parks	• EXCLUDE on intervention [Info] Green gym equipment
Cohen (2016)	CicLavia: Evaluation of participation, physical activity and cost of an open streets event in Los Angeles	• EXCLUDE - study type
Cope et al 2010	Cycling demonstration Towns - an economic evaluation.	• EXCLUDE - duplicate [Info] *data reported elsewhere*

COWI and City of Copenhagen 2009	Economic Evaluation of cycle projects - methodology and unit prices	• EXCLUDE on study type [Info] Cross sectional survey
Cranney (2016)	Impact of an outdoor gym on park users' physical activity: A natural experiment	• EXCLUDE on intervention [Info] outdoor gym installation
Crawford (2013)	Tampa combines bus and toll lanes	• EXCLUDE - unavailable
Davey (2008)	Design of a pragmatic cluster randomised controlled trial: Ecological approach to increasing physical activity in an urban community	• EXCLUDE on intervention
De Cocker , Katrien A, De Bourdeaudhuij , Ilse M, Brown Wendy J, and Cardon Greet M, 2007	Effects of '10,000 Steps Ghent' A Whole-Community Intervention	• EXCLUDE on intervention
De Oliveira (2013)	How effective is the Forestry Commission Scotland's woodland improvement programme-'Woods In and Around Towns' (WIAT)-at improving psychological well-being in deprived urban communities? A quasi-experimental study	• EXCLUDE no data to extract
De Smedt et al 2012	A cost-effectiveness study of the community-based intervention "10 000 Steps Ghent"	• EXCLUDE on intervention
Deehr (2009)	Active Seattle: Achieving Walkability in Diverse Neighborhoods	• EXCLUDE on outcomes
Dobson (2009)	From Partnership to Policy: The Evolution of Active Living by Design in Portland, Oregon	• EXCLUDE on outcomes
Economic appraisal of... (2006)	Economic appraisal of local walking and cycling routes	• EXCLUDE - unavailable
Engelberg (2014)	Ciclovia participation and impacts in San Diego, CA: The first CicloSDias	• EXCLUDE on outcomes
Farley (2007)	Safe play spaces to promote physical activity in inner-city children: Results from a pilot study of an environmental intervention	• EXCLUDE on intervention [Info] schoolyards
Fishman (2015)	Dutch Cycling: Quantifying the Health and Related Economic Benefits	• EXCLUDE - study type
Frank (2008)	Urban planning and public health: A story of separation and reconnection	• EXCLUDE - no data to extract

Frew et al 2014	Cost-effectiveness of a community-based physical activity programme for adults (be active) in the UK: an economic analysis within a natural experiment	• EXCLUDE on intervention
Frost (2010)	Effects of the built environment on physical activity of adults living in rural settings	• EXCLUDE - relevant systematic review
Ganten (2010)	Health co-benefits of policies to tackle climate change	• EXCLUDE - no data to extract
Garrard and Crawford, 2010	Evaluation of the Victorian Ride2School Program: Impacts and Insights into Promoting Active Travel to School.	• EXCLUDE on intervention
Geraghty (2009)	Partnership Moves Community Toward Complete Streets	• EXCLUDE on study type
Gerike (2016)	Physical Activity through Sustainable Transport Approaches (PASTA): A study protocol for a multicentre project	• EXCLUDE - no data to extract
Ghekiere (2014)	Critical environmental factors for transportation cycling in children: A qualitative study using bike-along interviews	• EXCLUDE - study type
Gomez-Feliciano (2009)	Active Living Logan Square: Joining Together to Create Opportunities for Physical Activity	• EXCLUDE on intervention
Gotschi (2011)	Costs and benefits of bicycling investments in Portland, Oregon	• EXCLUDE - study type
Greg (2010)	Do transport planning tools reflect the needs of the older traveller?	• EXCLUDE - qualitative
Guell (2012)	Towards a differentiated understanding of active travel behaviour: using social theory to explore everyday commuting	• EXCLUDE on intervention
Gunn L D, Lee Y, Geelhoed E, Shiell A, and Giles-Corti B, 2014	The cost-effectiveness of installing sidewalks to increase levels of transport-walking and health	• EXCLUDE on study type [Info] Cross sectional survey
Guo (2010)	An economic evaluation of health-promotive built environment changes	• EXCLUDE - study type
Haerens et al 2007	Acceptability, feasibility and effectiveness of a computer-tailored physical activity interventin in adolescents	• EXCLUDE on intervention
Hallgrimsdottir Berglind, Svensson Helena, and Stahl Agneta, 2015	Long term effects of an intervention in the outdoor environment--a comparison of older people's perception in two residential areas, in one of which accessibility improvements were introduced	• EXCLUDE on study type [Info] Cross sectional survey
Heath (2012)	Evidence-based intervention in physical activity: Lessons from around the world	• EXCLUDE - relevant systematic review

Heinen (2015)	Sociospatial patterning of the use of new transport infrastructure: Walking, cycling and bus travel on the Cambridgeshire guided busway	• EXCLUDE - study type
Henderson (2013)	Safe routes to school: a public health practice success story-Atlanta, 2008-2010	• EXCLUDE on intervention
Hinckson (2011)	School travel plans: preliminary evidence for changing school-related travel patterns in elementary school children	• EXCLUDE on intervention
Hooker (2007)	Walkable Neighborhoods for Seniors: The Alameda County experience	• EXCLUDE on intervention
Hooker (2009)	Evaluation of the Walkable Neighborhoods for Seniors Project in Sacramento County	• EXCLUDE on intervention
Hooper (2014)	Evaluating the Implementation and Active Living Impacts of a State Government Planning Policy Designed to Create Walkable Neighborhoods in Perth, Western Australia	• EXCLUDE - no baseline data
Hunter (2015)	The impact of interventions to promote physical activity in urban green space: A systematic review and recommendations for future research	• EXCLUDE relevant systematic review
Hylton (2007)	The Walking Life	• EXCLUDE - no data to extract
Impacts of better use... (2009)	Impacts of better use transport interventions - review of the evaluation evidence base	• EXCLUDE - unavailable
Irvine (2013)	Understanding urban green space as a health resource: A qualitative comparison of visit motivation and derived effects among park users in sheffield, UK	• EXCLUDE - Qualitative
Jalaludin B, Maxwell M, Saddik B, Lobb E, Byun R, Gutierrez R, and Paszek J, 2012	A pre-and-post study of an urban renewal program in a socially disadvantaged neighbourhood in Sydney, Australia	• EXCLUDE on intervention
Jones (2012)	Getting the British back on bicycles - The effects of urban traffic-free paths on everyday cycling	• EXCLUDE - study type
Jones (2012)	Motivations for active commuting: a qualitative investigation of the period of home or work relocation	• EXCLUDE - study type
Jones et al 2016	CycleBOOM: Design for lifelong health and wellbeing	• EXCLUDE - qualitative

Jordan et al 2008	Evaluation of the Gold Medal Schools Program	• EXCLUDE on intervention
Kaida and Kaida 2014	Spillover effect of congestion charging on pro-environmental behavior	• EXCLUDE on study type [Info] Cross sectional survey
Keuleers (2006)	Behavioural Change in Activity-Travel Patterns in Response to Road User Charging	• EXCLUDE - study type
Kinney (2012)	Isanti County Active Living: Measuring Change in Perception and Behavior	• EXCLUDE on study type
Kirby (2009)	Active travel to school: views of 10-13 year old schoolchildren in Scotland	• EXCLUDE - Qualitative
Klassen (2014)	Analyzing the severity of bicycle-motor vehicle collision using spatial mixed logit models: A city of edmonton case study	• EXCLUDE - out of scope
Koohsari et al 2014	Street connectivity and walking for transport: role of neighborhood destinations	• EXCLUDE - no data to extract
Krieger (2009)	High point walking for health: creating built and social environments that support walking in a public housing community	• EXCLUDE on intervention
Krizec (2007)	Estimating the Economic Benefits of Bicycling and Bicycle Facilities: An Interpretive Review and Proposed Methods	• EXCLUDE - unavailable
Kuhlberg (2014)	Open streets initiatives in the United States: closed to traffic, open to physical activity	• EXCLUDE on study type[Info] Not a systematic review
Laine (2014)	Cost-Effectiveness of Population-Level Physical Activity Interventions: A Systematic Review	• EXCLUDE - relevant systematic review [Info] cost effectiveness of interventions to increase PA - some environmental changes in there that might be relevant
Lanzendorf (2014)	The cycling boom in large German cities--Empirical evidence for successful cycling campaigns	• EXCLUDE - study type

Lawrie (2006)	Research Pays Off: Bikeways to Prosperity: Assessing the Economic Impact of Bicycle Facilities	• EXCLUDE on outcomes
Learnihan et al 2011	Effect of scale on the links between walking and urban design.	• EXCLUDE on study type [Info] Cross sectional survey
Lee et al, 2009	The built environment and physical activity levels: the Harvard Alumni Health Study	• EXCLUDE - no data to extract
Li (2012)	Congestion charging and car use: A review of stated preference and opinion studies and market monitoring evidence	• EXCLUDE on outcomes
Loader (2009)	Growing bus patronage and addressing transport disadvantage The Melbourneexperience	• INCLUDE - transport
MacDonald (2010)	The Effect of Light Rail Transit on Body Mass Index and Physical Activity	• EXCLUDE - study type [Info] cross sectional association
Maddock (2008)	Increasing access to places for physical activity through a joint use agreement: a case study in urban Honolulu	• EXCLUDE on intervention
Margaret (2006)	Age-friendly cities	• EXCLUDE on study type
Martens (2007)	Promoting Bike-and-Ride: The Dutch Experience	• EXCLUDE - study type
Mason (2011)	Ciclovìa in Chicago: a strategy for community development to improve public health	• EXCLUDE on outcomes
McCormack (2011)	In search of causality: A systematic review of the relationship between the built environment and physical activity among adults	• EXCLUDE - relevant systematic review
McCreedy (2009)	Get Active Orlando: Changing the Built Environment to Increase Physical Activity	• EXCLUDE on study type
McDonald (2013)	Impact of the Safe Routes to School program on walking and biking: Eugene, Oregon study	• EXCLUDE on outcomes [Info] Analysis combines educational intervention with environmental changes so cannot tell whihc part of the

		intervention is effective
McDonald (2014)	Impact of the Safe Routes to School Program on Walking and Bicycling	• EXCLUDE - study type
McKee (2007)	Promoting walking to school: results of a quasi-experimental trial	• EXCLUDE on intervention
Mehdipanah (2013)	An evaluation of an urban renewal program and its effects on neighborhood resident's overall wellbeing using concept mapping	• EXCLUDE on country
Mendes (2009)	Neighborhood Social Cohesion and Disorder in Relation to Walking in Community-Dwelling Older Adults: A Multilevel Analysis	• EXCLUDE - study type [Info] association study
Michael (2014)	Environmental influences on healthy and active ageing: a systematic review	• EXCLUDE on intervention
Miller (2009)	Slavic Village: incorporating active living into community development through partnerships	• EXCLUDE on outcomes
Montemurro (2011)	"Walkable by Willpower": Resident perceptions of neighbourhood environments	• EXCLUDE on country
Moran (2014)	Understanding the relationships between the physical environment and physical activity in older adults: A systematic review of qualitative studies	• EXCLUDE - Qualitative
Moudon and Stewart, 2012	Moving Forward: Safe Routes to School Progress in Five States	• EXCLUDE - duplicate [Info] *Stewart 2014 duplicate*
Muller-Riemenschneider (2009)	Cost-effectiveness of interventions promoting physical activity	• EXCLUDE relevant systematic review
Mulvaney (2015)	Cycling infrastructure for reducing cycling injuries in cyclists	• EXCLUDE - relevant systematic review
Murthy (2015)	Making Our Communities Walkable for Older Adults	• EXCLUDE - no data to extract

Newton (2010)	Increasing Independence for Older People through Good Street Design	• EXCLUDE - qualitative
Nicaise (2012)	Evaluation of a redesigned outdoor space on preschool children's physical activity during recess	• EXCLUDE - out of scope
Nicholson (2014)	Developing a Measure of Traffic Calming Associated with Elementary School Students' Active Transport	• EXCLUDE - study type
O'Fallon, 2010	Bike Now: Exploring methods of building sustained participation in cycle commuting in New Zealand.	• EXCLUDE on intervention
Ogilvie (2010)	Shoe leather epidemiology: Active travel and transport infrastructure in the urban landscape	• EXCLUDE out of scope
Ogilvie (2010)	Commuting and health in Cambridge: a study of a 'natural experiment' in the provision of new transport infrastructure	• EXCLUDE - no data to extract
Ogilvie (2011)	An applied ecological framework for evaluating infrastructure to promote walking and cycling: the iConnect Study	• EXCLUDE - no data to extract
Ogilvie (2012)	Evaluating the travel, physical activity and carbon impacts of a 'natural experiment' in the provision of new walking and cycling infrastructure: Methods for the core module of the iConnect study	• EXCLUDE - no data to extract
Ogilvie (2016)	Health impacts of the Cambridgeshire Guided Busway: a natural experimental study (Structured abstract)	• EXCLUDE - duplicate[Info] data reported elsewhere
Ogilvie (2016)	Health impacts of the Cambridgeshire Guided Busway : a natural experimental study	• EXCLUDE - duplicate
Omishakin (2009)	Achieving Built-Environment and Active Living Goals Through Music City Moves	• EXCLUDE on study type
Orenstein (2007)	Safe Routes to School: Safety & Mobility Analysis: Report to the California Legislature	• EXCLUDE - duplicate
Panken and Holaly-Zembo, 2015	Using an integrated approach to evaluate "Where do Flint's families play"	• EXCLUDE - no baseline data

Petticrew (2009)	The SHARP study: A quantitative and qualitative evaluation of the short-term outcomes of housing and neighbourhood renewal	• EXCLUDE on intervention
Pucher (2010)	Infrastructure, programs, and policies to increase bicycling: An international review	• EXCLUDE - relevant systematic review
Rantakokko (2012)	Perceived barriers in the outdoor environment and development of walking difficulties in older people	• EXCLUDE - Qualitative
Reed (2009)	Profile differences of users of paved versus natural-surface trails	• EXCLUDE on outcomes
Reynolds (2014)	Systematic review of incidental physical activity community interventions	• EXCLUDE - out of scope
Richardson (2013)	Building HIA approaches into strategies for green space use: an example from Plymouth's (UK) Stepping Stones to Nature project	• EXCLUDE no data to extract
Rind (2015)	"I used to be as fit as a linnet" - Beliefs, attitudes, and environmental supportiveness for physical activity in former mining areas in the North-East of England	• EXCLUDE - Qualitative
Rissel (2013)	Evaluating the transport, health and economic impacts of new urban cycling infrastructure in Sydney, Australia - protocol paper	• EXCLUDE - no data to extract
Rose and Marfurt, 2007	Travel behaviour change impacts of a major ride to work day event.	• EXCLUDE on intervention
Rosenberg (2011)	Physical activity among persons aging with mobility disabilities: Shaping a research agenda	• EXCLUDE on study type
Rutt (2008)	Using policy and built environment interventions to improve public health	• EXCLUDE - no data to extract
Saelens (2008)	Built environment correlates of walking: a review	• EXCLUDE on study type
Sarmiento (2010)	The Ciclovia-Recreativa: A mass-recreational program with public health potential	• EXCLUDE relevant systematic review [Info] Not all papers relevant, country dependent
Sayers (2012)	Bike, Walk, and Wheel: A Way of Life in Columbia, Missouri, Revisited	• EXCLUDE - study type

Schasberger (2009)	Promoting and Developing a Trail Network Across Suburban, Rural, and Urban Communities	• EXCLUDE on outcomes
Schasberger (2009)	Promoting and Developing a Trail Network Across Suburban, Rural, and Urban Communities	• EXCLUDE on outcomes
Simons (2014)	Why do young adults choose different transport modes? A focus group study	• EXCLUDE on country
Skelton (2013)	Environmental and behavioural interventions for reducing physical activity limitation in community-dwelling visually impaired older people	• EXCLUDE relevant systematic review
Slavulj (2012)	Stimulation of Public Urban Passenger Transport through Transport Demand Management (Poticanje javnoga gradskoga putni~kog prijevoza upravljanjem prijevozne potra`nje)	• EXCLUDE - unavailable
Soler (2013)	Play streets: working together to encourage healthier living in communities. Interviewed by Jamie Devereaux	• EXCLUDE - study type
SQW Consulting 2007	Valuing the benefits of cycling: A report to Cycling England	• EXCLUDE - no data to extract
SQW Consulting 2008	Planning for cycling: report to Cycling England	• EXCLUDE - unavailable
Stevens (2011)	Walkable new urban LEED_Neighborhood-Development (LEED-ND) community design and children's physical activity: Selection, environmental, or catalyst effects?	• EXCLUDE - no baseline data
Stewart (2015)	What interventions increase commuter cycling? A systematic review	• EXCLUDE - relevant systematic review
Stokes (2008)	Estimating the effects of light rail transit on health care costs	• EXCLUDE on study type
Strath (2007)	Operationalizing environmental indicators for physical activity in older adults	• EXCLUDE out of scope
Strath (2007)	Operationalizing environmental indicators for physical activity in older adults	• EXCLUDE - out of scope
Susilo (2012)	The Influence of Individuals' Environmental Attitudes and Urban Design Features on Their Travel Patterns in Sustainable Neighborhoods in the UK	• EXCLUDE on study type [Info] cross sectional survey

Sustrans Scotland 2014	Sustrans Scotland: walking and cycling outcomes, Sustrans' Scottish Government Grant 2012-2015.	• EXCLUDE on intervention
Taylor (2007)	Changing social and built environments to promote physical activity: recommendations from low income, urban women	• EXCLUDE - study type
Tenbrink (2009)	Project U-Turn: Increasing Active Transportation in Jackson, Michigan	• EXCLUDE - no data to extract
Thomas (2009)	Bike, Walk, and Wheel: A Way of Life in Columbia, Missouri	• EXCLUDE on study type
Timperio (2015)	Playability: Built and Social Environment Features That Promote Physical Activity Within Children	• EXCLUDE on study type [Info] Relevant SR - all cross sectional studies included
Toftager (2011)	SPACE for physical activity--a multicomponent intervention study: study design and baseline findings from a cluster randomized controlled trial	• EXCLUDE on study type [Info] The paper describes the study design, data collection, intervention components and implementation. No results presented.
Trayers (2006)	Improving health through neighbourhood environmental change: Are we speaking the same language? A qualitative study of views of different stakeholders	• EXCLUDE - no data to extract
Tully (2013)	Built environment interventions for increasing physical activity in adults and children	• EXCLUDE relevant systematic review [Info] open space and transport
Tully (2013)	Physical activity and the rejuvenation of Connswater (PARC study): protocol for a natural experiment investigating the impact of urban regeneration on public health	• EXCLUDE - no data to extract
Umstattd (2016)	Physical Activity-Related Policy and Environmental Strategies to Prevent Obesity in Rural Communities: A Systematic Review of the Literature, 2002-2013	• EXCLUDE - out of scope

Van Cauwenberg (2014)	Using manipulated photographs to identify features of streetscapes that may encourage older adults to walk for transport	• EXCLUDE - out of scope
van Sluijs (2007)	Effectiveness of Interventions to Promote Physical Activity in Children and Adolescents: Systematic Review of Controlled Trials	• EXCLUDE on intervention [Info] systematic review but not relevant
Van Sluijs (2008)	Effectiveness of interventions to promote physical activity in children and adolescents: Systematic review of controlled trials	• EXCLUDE on intervention
Vandenberg (2016)	Walking and Walkability: Is Wayfinding a Missing Link? Implications for Public Health Practice	• EXCLUDE on intervention
Vanwolleghem (2014)	Feasibility and effectiveness of drop-off spots to promote walking to school	• EXCLUDE - out of scope
Veitch (2014)	A natural experiment to examine the impact of park renewal on park-use and park-based physical activity in a disadvantaged neighbourhood: the REVAMP study methods	• EXCLUDE - no data to extract
Verstraete et al 2006	Increasing children's physical activity levels during recess periods in elementary schools: the effects of providing game equipment	• EXCLUDE on intervention
Villa-Gonzalez (2016)	Effectiveness of an active commuting school-based intervention at 6-month follow-up	• EXCLUDE on intervention
Vuori (2011)	Promoting cycling: a review of interventions	• EXCLUDE - relevant systematic review
Wells (2008)	Neighborhood Design and Walking. A Quasi-Experimental Longitudinal Study	• EXCLUDE on intervention
Wen (2008)	Increasing active travel to school: Are we on the right track? A cluster randomised controlled trial from Sydney, Australia	• EXCLUDE on intervention
West (2011)	The impacts of building a greenway on proximate residents' physical activity	• EXCLUDE - duplicate
Wilson and Cope 2011	Value for money of walking and cycling interventions: making the case for investment in active travel.	• EXCLUDE - no data to extract
Wolf (2015)	The impact of a temporary recurrent street closure on physical activity in New York City	• EXCLUDE - study type

Zangenehpour (2016)	Are signalized intersections with cycle tracks safer? A case-control study based on automated surrogate safety analysis using video data	• EXCLUDE - study type
Zapata Diomedi et al 2016	The effects of built environment attributes on physical activity-related health and healthcare costs outcomes in Australia	• EXCLUDE - relevant systematic review
Zheng (2016)	Time-dependent area-based pricing for multimodal systems with heterogeneous users in an agent-based environment	• EXCLUDE - study type
Zhu (2014)	A retrospective study on changes in residents' physical activities, social interactions, and neighborhood cohesion after moving to a walkable community	• EXCLUDE on study type
Zieff (2014)	A "Ciclovia" in San Francisco: Characteristics and physical activity behavior of Sunday Streets participants	• EXCLUDE on study type [Info] Cross sectional survey
Zook (2012)	Design and Pedestrianism in a Smart Growth Development	• EXCLUDE - study type

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