what works centre for local economic growth

Rapid evidence review: Public spaces

Introduction

Public spaces are spaces that are outdoors and open to all. Most public investment in these spaces aims to create or improve:

- Public realm, for example on high streets and in town centres
- Active travel infrastructure, including cycle paths and footpaths
- Green spaces, including parks, parklets, and urban forests.

This review summarises the evaluation evidence on public realm and green space schemes. Another review summarises the evaluation evidence on active travel infrastructure. Our briefing on assessing the local economic impacts of public spaces is informed by these two rapid evidence reviews.

Things to consider

Need for more evidence

- We need more robust impact evaluations of public realm and green space schemes.
- There is a particular need for evaluation of local economic impacts such as employment and wages, and a need to understand the distributional impacts of investment in public spaces.

Policy lessons are covered in the briefing.

Evaluation evidence

What is public space?

Public spaces are spaces that are outdoors and open to all. This rapid evidence review focuses on two types of public space:

- Public realm, for example, on high streets and in town centres. This includes any element of the built environment that affects the functionality or attractiveness of a place and can include shop fronts, paving, seating, and planting.
- Green spaces, such as parks, parklets, and urban forests.

Another type of public space – active travel infrastructure such as cycle paths and footpaths, alongside pedestrianisation and traffic calming measures – is covered in another rapid evidence review.

Understanding the impact of investment in public spaces

Our evidence reviews use studies with a score of three or above on the Maryland Scientific Methods Scale (SMS), which classifies evaluations based on methodological robustness and implementation.[1] Our toolkits and rapid evidence reviews also include studies with a score of two or above when these add to the evidence base. A third of the studies included in this rapid evidence review score SMS 3 or above.

Our search identified ten evaluations. Three were scored as SMS 3, and seven as SMS 2. We give more weight to those with higher scores, and flag those scoring SMS 3. Three systematic reviews have also been included. The annex provides a summary of each study.

The findings are organised by type of public space and outcome. Be cautious of findings based on a small number of studies.

Evidence on impacts

Public realm

No studies look exclusively at public realm – but three studies look at interventions that involve a mix of activities including public realm improvements. These studies cannot disentangle the effect of public realm improvements from other elements of the programme.

Two of the studies scored SMS 3, with the other SMS 2. One study looks at an intervention to improve the economic performance of town centres, with the other two looking at urban regeneration. Urban regeneration policies can have various aims including changing the size or composition of population in an area, improving economic and social outcomes for existing residents, or attracting employment to the area.

None of the studies find overall effects but each finds some effects for specific cases or groups. For example, one study (PS-1) considers a policy which improves town centre economic performance in one US state, but not in three others.

- PS-1 (SMS 3) studies the Main Street Program, which provides communities with the resources and knowledge to rejuvenate commercial districts. The programme involves a combination of design, promotion, organisational, and economic development activities. The

1 For more information on how we rank the robustness of evaluations, see our introduction to the Maryland Scientific Methods Scale.

study finds the programme had no effect on the number of businesses, retail employment or total employment in downtown districts in rural towns across four US states (Michigan, Ohio, Wisconsin and Iowa). Analysis on a state-by-state basis, finds effects in Iowa – participation leads to an increase of roughly two new retail establishments per 1,000 people, and 20 new downtown retail jobs per 1,000 people in the five years following programme adoption.

- PS-2 (SMS 3) looks at a major urban renewal policy targeted at deprived neighbourhoods in Spain. The majority of spend improved public spaces and facilities, with smaller amounts spent on renovating apartments and on social services. The study finds no effect on total population or population composition (by ethnicity and education-level). There are effects in historic districts and in central Barcelona, where the policy appears to have accelerated gentrification.
- PS-3 looks at the local effects of urban regeneration policies in small and medium-sized cities in Italy. The largest proportion of spend improved public realm and provided public amenities, including renovating public squares, creating green spaces, improving road networks, and building schools. Some funds were spent on housing, skills, and business support. The study finds no effects on population, share of foreign citizens, employment, number of plants, house prices, income, or the Gini coefficient (a measure of inequality). House prices increase in the areas receiving the most funding, and in areas that spend the majority (90 percent or more) of their funding on improving the public realm. As many of these areas were also amongst the largest projects there is a possibility that this effect reflects the scale of funding rather than its focus on public realm. Effects on house prices were also observed in the earliest projects – suggesting effects may take time to come through.

Public realm improvements may also aim to improve the functionality of a place. Walkability can be an important element of this, with pedestrianisation one approach to achieving this. The evidence on these interventions is discussed in the accompanying rapid evidence review on active travel infrastructure. It finds that improving walkability may increase walking, but there is not currently a strong causal link, and there is not enough evidence on what aspects of walkability matter and for whom. The evidence on the impact on local economic outcomes, property prices and health outcomes is limited and mixed.

Green spaces

Green spaces and property prices

Property prices reflect the characteristics of a property (e.g. size, condition) and its location. A large number of studies use 'hedonic' analysis to understand how different attributes affect prices – with the first study looking at the role of environmental amenities undertaken in 1967. A large-scale review (SR-1) considering the evidence on the role of green spaces in property prices in 2005 finds:

- Proximity to green spaces has mixed effects on property prices.
- Effects vary across different types of green spaces and amenities.
- Green spaces may provide more value in urban areas than suburban areas.

Most studies look at a particular type of green space and relatively small geographies. PS-4 addresses this by looking at the impact of a diverse range of natural settings including habitats, designated areas, heritage sites, and domestic gardens on house prices across England. It finds that there is substantial amenity value attached to proximity to environmental amenities, estimating that moving from a postcode in the bottom one percent for accessibility to environmental amenities to a postcode in the top one percent is worth about £105,000 (or £3,700 per year).

Green spaces and gentrification

One study, scoring SMS 2, looks at the impact of green spaces on gentrification.

PS-5 finds location and function of parks are strong predictors of gentrification in 10 major US cities, while park size is not (i.e. small parks were as likely as large parks to stimulate gentrification). New greenway parks that included active transport infrastructure such as cyclepaths were more likely to lead to gentrification than other park types. Having this type of park within half a mile increased the likelihood of gentrification by 145 percent. New parks located close to downtown areas were more likely to lead to gentrification than parks on a city's outskirts.

Green spaces and health

Five studies look at the effects of green spaces on health outcomes. One study scored SMS 3 and four SMS 2. Varied measures of health are used, from self-reported assessment of health through to mortality statistics. All studies related to green space near participants' place of residence.

These studies generally find positive effects on health outcomes, although in many cases effects are only observed for some measures of health or some definitions of green space, suggesting the relationship between green space and health is complex.

- PS-6 (SMS 3) looks at the US's largest public housing scheme and finds higher attention and ability to manage major life issues for residents with some access to nature than those living in the same scheme with no exposure. Given that the green spaces in this study were very limited (often just a small patch of grass or a small number of trees), it suggests that green spaces can have an impact even if it is limited.
- PS-7 finds better self-perceived health for those living in greener environments than those living in less green environments. It finds green spaces are important for all age groups and education levels, and across different levels of urbanity (measured as number of households per square km).
- PS-8 finds that living in a neighbourhood with a high proportion of green space positively affects a range of health indicators including number of symptoms experienced in the last 14 days, perceived general health and a score indicating propensity to psychiatric disorders. Living in a neighbourhood with a high proportion of blue space or having a garden positively affects the number of symptoms measure only. Green spaces have a greater impact on health than the degree of urbanity (again measured as number of households per square km). Effects are concentrated amongst those with lower education levels. Amongst those likely to spend more time near home, green spaces influence symptoms reported (but not other measures) for older people and (self-defined) housewives. Green spaces do not influence any of the health outcomes for children.
- PS-9 finds lower health inequalities in greener environments. It uses an incidence rate ratio (IRR), to compare two groups – the 25 percent most income-deprived neighbourhoods and the 25 percent least income-deprived neighbourhoods. If the health outcome was the same in both groups, the IRR would be one. If the health outcome was twice as bad in the most deprived areas than in the least deprived, the IRR would be two. The study uses various measures of mortality to assess health inequalities. The IRR for all-cause mortality was 1.93 in the least green areas, but only 1.43 in the greenest, meaning health inequalities were greater in the least green areas than the most. The evidence was mixed when specific diseases were considered. The IRR for circulatory diseases mortality was 2.19 in the least green areas and 1.54 in the greenest, but there was no or weak evidence on lung cancer and intentional self-harm mortality.
- PS-10 finds local street trees are associated with lower odds of having a premature birth, suggesting potential health benefits for pregnant women. Other measures considered –

greenness, access to green spaces, and waterfront access – have no effect on the odds of premature birth, and none of the measures impacts on the odds of having a low birth weight at term.

In addition, we identified two systematic reviews.

- SR-2 synthesises evidence from 24 randomised controlled trials that looked at the health effects of engaging in physical activity within green spaces, including walking, cycling, and exercise programmes. It finds that undertaking physical activity in green spaces had positive effects on self-reported mood results and on physiological indicators including heart rate levels.
- SR-3 synthesises the evidence from six studies that evaluate the impact of greening school playgrounds. Overall, it finds greening has positive effects on physical activity and socio-emotional health outcomes for students.

Overall, the evidence suggests that access to green spaces can improve health outcomes and perceptions of health. This could have important long-term economic and social benefits.

Are they cost effective?

None of the studies considers cost effectiveness.

Annex: Evidence on public spaces

For this rapid evidence review, we looked for evaluation evidence of public spaces on local economic and wider outcomes. We searched for studies relating to public realm and green spaces, using a wide range of terms. We focused on evidence from OECD countries (or similar), published in English. We considered any study providing before-and-after comparisons or cross-sectional studies controlling for differences between areas. We also included more robust studies that compare changes in outcomes in treated areas with changes in outcomes in similar non-treated areas.

We found ten studies. Of these, three were assessed as SMS 3, and seven as SMS 2. In summarising the evidence, we place greater emphasis on studies that used more robust methods. Two studies are from the UK, four from the US, 2 from the Netherlands, and one each from Italy and Spain. This annex provides a summary of each study.

Our search also identified three systematic reviews. As these studies provide useful insights for policymaking, we include them in the review. It is not possible to score systematic reviews against the Maryland Scientific Methods Scale that we use for individual studies. Care should be taken in interpreting the results as not all studies included in a systematic review may meet our standards (SMS 2 or above).

Public realm

PS-1 (SMS 3, US) examines the impact of an economic revitalisation programme on job and business growth in downtown retail districts. The study uses a difference-in-differences analysis to estimate the impact of the Main Street Programme (MSP) on rural downtown retail districts in four Midwestern states (Michigan, Ohio, Wisconsin and Iowa), comparing economic outcomes between participating and non-participating but otherwise similar communities. It uses business establishment data from Infogroup, Inc., population data from the US Bureau of Economic Analysis and data from MSP websites. The final pooled sample consists of 146 communities over a nine-year period (from three years before to five years after treatment), resulting in 1,314 observations. Looking at the pooled sample of all four states, the study finds no statistically significant effects of MSP adoption on either total downtown jobs and establishments or downtown retail jobs and establishments. However, analysis at the state level finds a statistically significant effect for communities in rural Iowa, for which participation in the MSP is associated with about 20 new downtown retail jobs per 1,000 people and two new retail establishments per 1,000 people in the five years following programme adoption.

PS-2 (SMS 3, Spain) evaluates the impact of a major urban renewal policy that was implemented in some of the most deprived neighbourhoods in Catalonia, Spain, between 2004 and 2010. The policy focused on investments in public spaces and public use facilities, aimed at improving the quality of life in the treated neighbourhoods, reducing ethnic segregation among native and immigrant groups, and attracting high-income individuals. A small amount of spending also went on renovating apartments and social services. The study estimates the impact on gross population, native population, immigrant population, and population with college education. The paper compares outcomes in 39 areas receiving funding with an average investment of €3,065 per inhabitant, against a group of 68 areas with rejected projects and 35 areas with projects that had been successful but where budgets had not yet been spent. The study uses a difference-in-differences approach with a linear control for neighbourhood pre-treatment trajectories, and an Oaxaca-Blinder to overweight control neighbourhoods that are more similar to the treated neighbourhoods. The study finds that the policy has little or no effect on population dynamics, although the interventions made in historic districts and in central Barcelona did seem to accelerate gentrification.

PS-3 (SMS 2, Italy) examines the local effects of urban regeneration policies (URPs) in small and

medium-sized cities in the centre and north of Italy on socio-economic outcomes over the period 2008 to 2012. In the URPs covered, the largest expenditure was generally on improving the public realm and providing public amenities. This included renovating public squares, creating green spaces, improving road networks, and building schools. Some cities also funded housing improvements, and many spent some money on approaches to improve local growth, such as skills training or subsidies for small businesses. The URPs examined were across 26 municipalities in five regions (Lazio, Liguria, Piemonte, Toscana and Umbria), with these compared to a control group of 606 municipalities in nine regions (Lazio, Liguria, Piemonte, Toscana, Umbria, Emilia Romagna, Lombardia, Marche and Veneto). The study uses Italian government data, and a difference-in-differences setup with an Oaxaca-Blinder estimator to re-weight the control group and make it comparable in terms of geographical, demographic, and socio-economic characteristics to the treated group. The study finds no evidence for URPs stimulating local economic growth (employment, plants, or income), changes in demographics (population and foreign citizens) or equality (Gini coefficient) in the period 2007 to 2015. House price increases are observed in URPs with larger funding and in those focusing expenditure (over 90 percent) on improving the public realm. However, many of the areas focusing expenditure on public realm are large projects, so the effects may be explained by the scale of the funding rather than the focus on public realm. There are also house price effects for the earliest projects, suggesting effects may take some time to appear.

Green spaces

Green spaces and property prices

SR-1 examines the effects of green spaces on property prices. The review considers over 60 studies on open spaces (including parks, greenbelts, forests, natural areas and wildlife habitats, wetlands, and farmland) and focuses on two approaches for estimating their value – revealed preference (hedonic property value studies) and stated preference (contingency value studies). The hedonic property value methodology uses information on house prices along with characteristics of the house and the surrounding land to infer values of open space; while the contingency value methodology uses surveys to induce individuals to reveal their preferences and draw out the value they place on an open space. The review finds mixed results. Both indicate a value to preserving parks, greenways, forests, and other natural areas in urban locations, but also a high variation of values reflecting factors including the size of the area, the proximity of the open space to residences, the type of open space, and the study methodology. Looking specifically at the hedonic property value studies, these also show mixed effects. Three studies suggest that increasing the percentage of surrounding land that is open space tends to increase average house prices by less than one percent. One study finds large natural areas and Class II wildlife habitats provide positive values (approximately 0.07 percent to 0.4 percent of median house values). Another study finds that all different types of open spaces provide more value in urban areas than in suburban ones. Results from the stated preference studies show that income tends to have a positive effect on the willingness to pay for different types of open space amenities, but the effect of the property's distance to the open space on the property's value tends to be mixed. Considering the disparities in results across studies of different types of open spaces, variables used and methodology, the review suggests that open space values are case-specific and further research is needed.

PS-4 (SMS 2, UK) investigates the effects of the natural amenities (i.e. proximity to habitats, designated areas, domestic gardens, and other natural amenities) on house prices in England. The sample consists of one million housing transactions between 1996 and 2008, with location determined using postcodes. Proximity is measured in a direct line from each house identified by its postcode and the nearest natural amenity, while land cover is defined in terms of the proportional

share (0–1) of a particular habitat within 1km square in which the property is located. Using a hedonic price approach and a cross-sectional regression model, the study finds a positive effect of natural amenities on house prices and increasing distance to natural amenities (measured in straight line between the natural amenity and each house identified by its postcode.) is unambiguously associated with a fall in prices. The study estimates that people are willing to pay £1,765 per year to avoid poor accessibility to amenities. Moreover, the top one percent postcode in terms of accessibility to natural amenities in England is worth about £100,000 (or £3,700 per year) more than the bottom one percent, suggesting that environmental amenities are highly valued by homeowners.

Green spaces and gentrification

PS-5 (SMS 2, US) examines the impact of new parks on housing prices and displacement of low-income people of colour across 10 major US cities. It uses data from the American Community Survey, the Longitudinal Tract Database, the US Department of Housing and Urban Development, and the Trust for Public Land. Using cross-sectional regressions, the study analyses whether the location, size, and function of parks built in the 2000 to 2008 and 2008 to 2015 periods have any relationship with gentrification in the surrounding census tracts. The study considers a census tract to be gentrified if there are increases in median household income and the percentage of people with a bachelor's degree, along with either a rise in median gross rent or median housing value greater than that of their city during the same period. The study controls for sociodemographic characteristics, housing features, and other urban amenities like access to rail transit. The results show that location and function of parks are strong predictors of gentrification, while park size is not. Specifically, new greenway parks (a corridor or linear trail set for recreational use or environmental protection) with active transportation components built between 2008 and 2015 are more likely to lead to gentrification than other park types, increasing the likelihood of gentrification by 145 percent in census tracts within half a mile of the park. New parks located closer to downtown areas are more likely to lead to gentrification than those on a city's outskirts.

Green spaces and health

PS-6 (SMS 3, US) examines whether green spaces affect the ability of individuals living in poverty to direct their attention and deal with major life issues. The study focuses on residents of Robert Taylor Homes (RTH) in Chicago, Illinois, the largest public housing project in the US. RTH consists of 28 architecturally identical high-rise blocks, with residents a relatively homogenous group that have little or no influence on which apartment within the project they are allocated. Green spaces were included when RTH was constructed but over time much of this has been lost, resulting in variations in exposure to 'nature' across the project. Combined this makes RTH a natural experiment, with residents randomly allocated with respect to how much nature is visible from their apartment. Data on attention and management of major life issues were collected from 145 residents through structured interviews and tests. The study finds that those living in apartments with limited exposure to nature (referred to as 'barren' in the study) have lower attentional functioning than those living in apartments with greater exposure (referred to as 'green'), and that management of major life issues is more effective in the green group than in the barren group. When attention is controlled for, the relationship between exposure to nature and management of life issues is no longer statistically significant, suggesting that attention is the mediator between nature and being able to manage major life issues. As the exposure to nature in this study is very limited (often only a few trees or a small patch of grass), it suggests green spaces can have an impact even at very low doses.

PS-7 (SMS 2, Netherlands) examines the relationship between green space and perceived general health. The data includes just over 250,000 people registered with 104 general practices who filled in a self-administered questionnaire on sociodemographic background and perceived general

health. The percentage of green space within one km radius and three km radius around the postal code coordinates for each household was calculated using the National Land Cover Classification database. The study uses a cross-sectional model at three levels (individual, family and practice) controlled by socio-demographic characteristics. It finds a positive relationship between green space and perceived general health, with people living in a greener environment reporting better self-perceived health than people living in a less green environment. 10.2 percent of residents living in areas where 90 percent of the environment is green feel unhealthy, compared to 15.5 percent of those living in areas where just 10 percent of environment is green. The percentage of green space within one km and three km has an effect on perceived general health at all levels of urbanity (measured as number of households per square km), and the proximity of green space becomes more important in the very strongly urban areas. Effects are observed across education levels and age groups but vary with the number of households per square km (i.e. level of urbanity) The study acknowledges that self-selection may play a role in the findings.

PS-8 (SMS 2, Netherlands) examines the effects of living in greener areas on residents' health. The study uses data on self-reported health from the first Dutch National Survey of Morbidity and Interventions in General Practice conducted by the Netherlands Institute for Health Services Research (NIVEL) in 1987 and 1988 and land-use data on the amount of green space drawn from a number of sources. The sample includes a total of over 10,000 respondents from 1,155 neighbourhoods. Using a cross-sectional model, the study finds that living in a green environment has a positive effect on self-perceived health, propensity to psychiatric disorders' scores, and number of symptoms experienced in the last 14 days. The effect is higher in urban areas, and concentrates amongst lower educated people, (self-defined) housewives and older people. Green spaces do not influence any of the health outcomes for children.

PS-9 (SMS 2, UK) investigates whether health inequalities are less pronounced in populations with greater exposure to green space in England. The study uses data from the Generalised Land Use Database (GLUD) 2001, and mortality records from the Office for National Statistics from 2001 to 2005. The study uses lower super output areas (LSOAs) as the geographical unit and calculates the percentage of each LSOA's land area that was classified as green space based on GLUD. The study focuses on deaths from circulatory diseases, lung cancer and intentional self-harm, and excludes populations older than retirement age. The study covers a population of almost 41 million, with over 360,000 deaths during the study period. The study uses a cross-sectional regression model and an incidence rate ratio (IRR), to compare two groups – the 25 percent most income deprived LSOAs and the 25 percent least income deprived LSOAs. If health outcomes are the same in both groups, the IRR is one. If health outcomes are twice as bad in the most deprived areas than in the least deprived, the IRR would be two. The IRR for all-cause mortality for the most income deprived quartile compared with the least deprived is 1.93 in the least green areas, whereas it is 1.43 in the greenest – i.e. green areas have lower health inequalities on this measure. For specific diseases the results are mixed. For instance, the IRR for circulatory diseases is 2.19 in the least green areas and 1.54 in the greenest. Associations are very weak or insignificant for deaths from lung cancer and intentional self-harm.

PS-10 (SMS 2, US) explores the relationship between expectant mothers' exposure to green and blue spaces and birth outcomes in New York City in 2000. Data on birth outcomes comes from New York City Department of Health and Mental Hygiene with a sample of 103,484. The Normalized Difference Vegetation Index (NDVI) was used as measure of residential greenness was estimated from the data in U.S. Geological Survey's (USGS) Earth Explorer website. Using cross-sectional regression and controlling for neighbourhood socioeconomic status, the study finds a negative relationship between local street trees and preterm birth (i.e. more trees reduces probability of a pre-term birth). Other measures – mean NDVI, access to major green spaces, or waterfront access – have no impact

on the likelihood of preterm birth or other birth outcomes such as birth weight at term.

SR-2 is a systematic review and meta-analysis of the findings from 24 randomised control trials that evaluated the physiological and psychological effects of direct exposure to green space. Each of the randomised control trials involved exposing participants to green space through activities. There were slight differences in intervention procedures across studies. The majority of the trials used a one-time, short-term exposure. Eleven trials involved exposure of 15 to 20 minutes, 10 were 30 to 60 minutes, and one was five minutes. The remaining two trials were long-term, with a total intervention duration of eight weeks. The intervention activities were predominantly walking and viewing, with cycling in two trials and a combined fitness programme in one trial. 15 of the 24 studies were conducted in forests, while the rest were conducted in urban parks, grasslands, woodlands, country lanes, and areas with green facades. The mean participant age for 17 out of 24 of the studies was 19 to 25 years with half of the studies involving mixed genders. The review finds that direct contact with green spaces through activities is likely to lead to improvement in mental health. An overall random effects model test on the selected samples finds that green space exposure had significant effects on alleviating fatigue, anger, tension, and confusion and enhancing vigour. Positive health effects were demonstrated by self-reported mood results from several studies, and exposure to green space was also shown to lower physiological indicators such as heart rates.

SR-3 reviews six experimental studies that investigate the impact of greening schoolyards on measures of physical activity and socio-emotional health in children. The review finds a positive impact of schoolyard greening on physical activity and socio-emotional health outcomes. One study finds that greening led to an increase in time spent in light physical activity and a decrease in sedentary behaviour among children younger than nine years old. Two studies suggest that schoolyard greening has a significant positive effect on girls' physical activity levels, helping to reduce gender disparities in physical activity. Another two studies find no significant changes in overall physical activity levels post-greening, but an increase in utilisation of greened areas in the schoolyard. In terms of socio-emotional health, several studies found positive associations between schoolyard greening and children's prosocial behaviours. For instance, one study finds that after schoolyard greening, there was a decrease in physical and verbal conflicts among children, and younger children showed improvement in their social functioning. Additionally, greening had a positive impact on emotionally positive social interactions, but older children reported a decrease in their prosocial behaviour (voluntary behaviours intended to benefit others). Two studies find a positive association between schoolyard greening and attention restoration, with children's scores improving after recess in greened schools. Furthermore, three studies find a positive association between schoolyard greening and mental wellbeing.
While one study shows no effect on children's mental wellbeing, it is likely that the impact may be underestimated due to factors such as the quality and quantity of green spaces and the lack of emotional issues among the baseline population on this study.

References

[PS-1] Van Leuven, A.J. (2022). “The impact of main street revitalization on the economic vitality of small-town business districts”, Economic Development Quarterly, vol. 36(3), pp.193-207.

[PS-2] González-Pampillón, N., Jofre-Monseny, J. and Viladecans-Marsal, E. (2020). “Can urban renewal policies reverse neighborhood ethnic dynamics?”, Journal of Economic Geography, vol. 20(2), pp. 419-457.

[PS-3] Albanese, G., Ciani, E. and De Blasio, G. (2021). “Anything new in town? The local effects of urban regeneration policies in Italy”, Regional Science and Urban Economics, vol. 86, p. 103623.

[PS-4] Gibbons, S., Mourato, S. and Resende, G. M. (2014). “The amenity value of English nature: a hedonic price approach”, Environmental and Resource Economics, vol. 57, pp. 175-196.

[PS-5] Rigolon, A. and Németh, J. (2020). “Green gentrification or ‘just green enough’: Do park location, size and function affect whether a place gentrifies or not?”, Urban Studies, vol. 57(2), pp. 402–420.

[PS-6] Kuo, F. E. (2001). “Coping with Poverty: Impacts of Environment and Attention in the Inner City”, Environment and Behavior, vol. 33(1), pp. 5–34.

[PS-7] Maas, J., Verheij, R. A., Groenewegen, P. P., de Vries, S. and Spreeuwenberg, P. (2006). “Green space, urbanity and health: how strong is the relation?”, Journal of Epidemiology and Community Health, vol. 60(7), pp. 587-592.

[PS-8] De Vries, S., Verheij, R.A., Groenewegen, P.P. and Spreeuwenberg, P. (2003). “Natural environments—healthy environments? An exploratory analysis of the relationship between greenspace and health”, Environment and Planning A, vol. 35(10), pp. 1717-1731.

[PS-9] Mitchell, R. and Popham, F. (2008). “Effect of exposure to natural environment on health inequalities: an observational population study”, The Lancet, vol. 372(9650), pp. 1655-1660.

[PS-10] Abelt, K. and McLafferty, S. (2017). “Green streets: urban green and birth outcomes”, International Journal of Environmental Research and Public Health, vol. 14(7), 771.

[SR-1] McConnell, V. and Walls, M. A. (2005). The value of open space: Evidence from studies of nonmarket benefits. Resources for the Future.

[SR-2] Song, S., Tu, R., Lu, Y., Yin, S., Lin, H. and Xiao, Y. (2022). “Restorative effects from green exposure: a systematic review and meta-analysis of randomized control trials”, International Journal of Environmental Research and Public Health, vol. 19(21), p. 14506.

[SR-3] Bikomeye, J. C., Balza, J. and Beyer, K. M. (2021). “The impact of schoolyard greening on children’s physical activity and socioemotional health: A systematic review of experimental studies”, International Journal of Environmental Research and Public Health, vol. 18(2), p. 535.

what works centre for
local economic growth

This work is published by the What Works Centre for Local Economic Growth, which is funded by a grant from the Economic and Social Research Council, the Department for Business and Trade, the Department for Levelling Up, Housing and Communities, and the Department for Transport. The support of the Funders is acknowledged. The views expressed are those of What Works Growth and do not represent the views of the Funders.

July 2023

What Works Centre for Local Economic Growth

info@whatworksgrowth.org
@whatworksgrowth

www.whatworksgrowth.org

HM Government

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL