Appendix 1 Literature review and attribute selection

A1.1 Overview and purpose

Overall, there is little previous non-market valuation evidence concerning the value of brownfield redevelopment within the UK. Studies from outside of the UK may be useful to illustrate methodologies, but they cannot be used as a comparison point for the with any confidence due to the difference in cultural preferences and values between places. While other literature was examined in the initial stages of this study, the review here will focus on the most relevant previous work

As a major driver of household value for brownfield redevelopment is the removal of disamenity, other studies that look at the cost of disamenity or the benefits of disamenity removal can also be useful comparison points.

A1.2 UK based evidence and research

A1.2.1 "Amenity Value Benefits of a Deposit Return Scheme for Drinks Containers", eftec (2020)

The purpose of this study was to further develop the evidence base on the amenity benefits of litter reduction for use by Defra in appraising a drinks container deposit return scheme (DRS). The study used a stated preference method implemented through online panels to 730 respondents in the 2020 to estimate household WTP values. The survey contained both a DCCV and a DCE exercise to gather data on preferences.

The impacts of litter were described in terms of the disamenity it creates to households and potential harm to the environment (e.g. plastics in the marine environment). Respondents were first asked a series of questions about litter in their local area and the impacts of that litter. The DCE attributes were specified as the location (e.g. residential area), the amount of litter present, the types of litter present, how much would be removed, and cost to the household (Figure A1.1).

Which option do you prefer?

	Scenario A (current situation)	Scenario B	Scenario C
Location and amount of litter *type of area and current amount of litter*	Recreation area Mostly free from litter *(No accumulation)*	Recreation area Mostly free from litter *(No accumulation)*	Recreation area Mostly free from litter *(No accumulation)*
Reduction in litter *how much litter is removed (or prevented) at the location*	No reduction	25% reduction *(1 in 4 items removed)*	95% reduction *(almost all items removed)*
Items of litter removed *the items of litter that are removed (or prevented) at the location*	None	Food packaging only	Drink container only (glass, cans and plastic)
Overall reduction in Local Authority area *reduction in these items of litter across your local area*	No reduction	60% reduction	40% reduction
Cost *cost to your household in terms of the change in the amount of council tax paid (starting in 2023 for 10 years)*	No change	£160 per year *(£13.30 per month)*	£120 per year *(£10.00 per month)*
Which option do you prefer?	○	○	○

Figure A1 1: Example DCE for choices on litter reductions from eftec (2020)

The study found that the visual disamenity from litter does impact respondents, and that there would be a range of benefits for households in reducing litter. Overall, these benefits were in the range of £67 per household per year (2022 prices), and these amenity values were subject to diminishing marginal benefit and variation according to the current level of litter. Households that currently experience more disamenity from litter were also generally willing to pay more to reduce that disamenity.

This study demonstrates that disamenity can be meaningfully described in terms of a set of attributes, and that stated preference methods can then be used to value that disamenity by describing the removal of that disamenity. This study also shows how context – such as the location of litter – can be used to frame a disamenity to respondents. All of these findings can be applied to this research to value the benefits of brownfield redevelopment. While the specific cause of disamenity is different – the general concept of improving an area by removing negative features of that area is generally the same.

A1.2.2 "Valuing the Benefits of Regeneration – Economics paper 7: Technical report – Environmental quality and amenity", Cambridge Economic Associates and eftec (2010)[1]

This study, conducted on behalf of DCLG, investigated how the benefits of regeneration might be valued. It created a conceptual framework, conducted an evidence review, and tested two approaches to valuing regeneration: (i) a stated preference study and (ii) a revealed preference study. The stated preference study is of primary interest, as it most closely relates to the current research.

The stated preference study investigated aspects of regeneration activities and environmental improvements in Seaham (East Durham, North East England). Seaham is an area that had already been subject to some regeneration schemes, and further schemes were credible at the time of this study. To generate preference data, the study used a DCE exercise. The attributes – which were determined through literature review and survey testing – mainly described amenity or environmental improvements. These were arranged in blocks: block one was improvements to open space and derelict properties restored; block two was the amount of outdoor facilities and street cleanliness; and block three was improvements to public areas and green routes. Each block also included attributes describing the location of improvements and cost to the household.

As a pilot study, the primary purpose of the CEA and eftec (2010) was to test and make recommendations of potential future research to elicit benefit values for regeneration schemes. The findings indicate that households were willing to pay for all of the environmental and amenity improvements – and that WTP was sensitive to location (WTP decreased with distance), household income (WTP increased with income), and the length of time living in a place (WTP for residents of greater than one year was high than those less than one year). The study also found a good level of respondent understanding in the survey materials and exercises. In combination, these results

[1] Two journal papers were published based on this research: Tyler, P., Warnock, C., Provins, A., and Lanz, B. (2012) and Lanz, B. and Provins, A. (2013)

indicate that the method and framing used are effective for generating value estimates.

Figure 2.15: Estimated marginal willingness to pay for improvements in local environmental amenity (£/unit/household/year)				
Attribute	**Unit**	**Location**		
		Improvements spread across all of East Durham area	Improvements spread across Seaham and the wider local area	All improvements in Seaham
Improved areas of open space	£/ha	0.05 (-0.96 – 1.06)	0.46 (-0.93 – 1.85)	1.80 (0.40 – 3.21)
Derelict properties restored	£/property	2.74 (0.25 – 5.22)	4.97 (1.96 – 7.97)	3.39 (1.27 – 5.53)
Amount of outdoor community facilities	£/additional facility	7.87 (-2.85 – 18.59)	15.38 (2.27 – 28.49)	17.13 (4.32 – 29.95)
Street cleanliness	£/grade	6.45 (-4.50 – 17.39)	21.36 (6.20 – 36.52)	18.80 (5.03 – 32.56)
Improved public areas	£/improvement	9.40 (-2.19 – 20.99)	19.07 (6.63 – 31.51)	24.15 (9.23 – 39.07)
Green routes	£/km	2.03 (-1.24 – 5.30)	3.49 (0.13 – 6.84)	4.11 (0.39 – 7.84)

Figure A1 2: WTP results from CEA and eftec (2010)[2]

A1.2.3 "A study to estimate the disamenity costs of landfill in Great Britain" Cambridge Econometrics, eftec, and WRc (2003)

This research estimated the disamenity costs of landfill in the UK, using a hedonic pricing method. This method used home sale transaction data along with spatial data on those sales and landfill sites to estimate the change in home values that was caused by proximity to those sites. This study is not a direct comparator, but some types of disamenity that are expected from landfill sites – such as visual disamenity – are shared with brownfield sites, and therefore the study can provide some context for the current research.

The study used a large data set of 592,000 housing transactions from 1991-2000 along with a database of 11,300 landfill sites to estimate the effects of those sites on home prices. They find that proximity to landfills does have significant effects on home prices, and that this effect varies by the actual distance, the region, the characteristics of the landfill sites. Overall, the average observed impact was £10,000 per home within ¼ mile, and £3,000 per home within ¼ to ½ mile (2022 prices).

This study is useful in considering a few aspects of the application of the brownfield research. The first is how WTP might vary with distance. In some regions the effect from landfills was found to be significant to a two-mile radius (Scotland), whereas in others the effect was only significant to ½-mile. The authors note that this may simply be due to the stability of the housing market in Scotland over the time period. At a minimum, however, this indicates that the aggregation of amenity benefits to households should be limited (e.g. 2 mile radius) unless more specific evidence indicates otherwise. The second aspect is in the scale of the costs one might expect from disamenities that are persistent.

[2] The values in this table are taken directly from the study results and are therefore in 2010 prices. According to the Bank of England CPI data, these values would be multiplied by 1.42 to get to 2022 prices.

Effects on home prices in this case reflect a "single payment" amenity impact – but as the impacts are in the thousands of pounds, an annual payment in the vicinity of £50-100 per year to reduce local disamenity is proportionate in scale.

A1.3 Attribute selection

Table 4.1 provides a long-list for the potential attributes and associated levels that were considered for the valuation scenario[3]. These covered both aspects of the brownfield sites (e.g. condition, previous use, existing amenity/disamenity features) and the aspects of the development of those sites (e.g. local environmental improvements, additional recreational opportunities, improved pedestrian connectivity, added visual amenity).

Table A1.1: Attribute long-list

Theme	Description	Examples (Levels)
Contamination status	Attributes relating to whether the land is contaminated by some previous use and will require remediation to redevelop and use safely	None, minor, significant contamination / risk
Occupancy type and quantity	Attributes describing both current and future occupancy, as well as no. residential or commercial units	Commercial / residential units (qty)
Level of building degradation	Attributes describing how degraded the current buildings on the site are, from good condition to dangerous and at risk of collapse	Usable structures (qty), dangerous structures (qty)
Historic/ culturally significant aspects	Attributes describing any historic or cultural structures, features, or places that might exist within a site	Heritage site, arts area, mural, community theatre, library
Pedestrian access and connectivity	Attributes describing sidewalks, paths, bikeways, or other features that allow for pedestrian movement	Bike path (km), pedestrian walkway (km)
Transport access and connectivity	Attributes describing road configurations, parking, bus stops, or other features relating to car or public transport travel	Bus stops (qty), train connection (qty), parking spaces (qty)
Recreation opportunities	Attributes describing any existing or future recreational opportunities provided by the site/development	Walking trails (km), play area/facilities (qty)
Landscaping and open space	Attributes describing green space, landscaping, hardscaping, or parks within the site	Trees (qty), hardscaping (area), green space (area)
Environmental assets and benefits	Attributes describing environmental assets and feature contained within the site, or the benefits of environmental changes	Forest (area), pond (area), grassland (area), rare species (qty), air quality (ppm)
Construction / development traits	Attributes describing the construction process and relevant effects that will have on the local community	Time in construction (years), available use during construction (% of area)
Cost of intervention	Attribute describing the cost of the policy intervention	Council tax increase (£)

[3] The long-list of attribute themes was developed with the input of SQW and Homes England in the project workshop, held Dec 2021.

Based on expectations for Homes England brownfield interventions, some of these attribute themes have greater direct relevance to the overall evidence need. This is part-informed by a review of Homes England case studies, some of which are outlined in Appendix 3, the direct input of Homes England, and the guidance of SQW.

Below is the short-list of attributes that was identified in conjunction with input from Homes England, along with the reasoning for prioritising these aspects over others in the long-list.

- Cost of intervention – required for obtaining monetary values for policy interventions.
- Contamination status - a key part of many of Homes England's developments is contamination removal or mitigation (incl. former industrial sites, waste processing, quarries, former petrol stations, etc)
- Level of building degradation - an increasing remit of Homes England to consider town centres and estate regeneration schemes. These projects are likely to include derelict properties or buildings/houses/town centres in a dilapidated state (e.g. Harlow).
- Occupancy type and quantity – there are large differences between lower-density housing schemes, relative to inner-city high-density developments, with Homes England delivering across all of these scheme types.
- Landscaping, open space, and environmental features – environmental improvements are an important part of HE's offer and will be increasingly important within urban/regeneration schemes.
- Connectivity / pedestrian access – this is an increasingly important subject with move towards 15-minute neighbourhoods and sustainable transport solutions, which includes both public transit and pedestrian transport.
- Distance and size – necessary to get willingness to pay estimates that are usable in the context of household utility increases.

A1.4 DCE framing

Table A1.2 illustrates three potential DCE framing scenarios. Given the main focus of the study - to obtain values for removing disutility and disamenity of existing brownfield – the initial survey development and testing was based around Option 1 whilst exploring supplemental choice exercises that establish preferences (and/or values) for "end state" outcomes.

Table A1.2: DCE framing options

<table>
<tr><th>DCE framing</th><th>Strengths</th><th>Weaknesses</th><th>Anticipated evidence</th><th>Framing Sketch</th></tr>
<tr><td>Option 1 - Status quo starting state with two to three intervention options</td><td>Allows respondent to opt out of making a choice by continuing the status quo at no cost (no action), thereby making WTP findings more robust.</td><td>Ending states and interventions are likely to be similar across projects, so varying the ending state may be an inefficient use of respondents' choices and attention.</td><td>Preferences and values for specific interventions to specific types of sites.</td><td>Two sites in your area are available for re-development, please select your preferred site for development. The completed development will have the following – Attribute 1, attribute 2, etc.
<table><tr><th></th><th>Site A</th><th>Site B</th><th>Neither</th></tr><tr><td>Visual</td><td>Visual</td><td>Visual</td><td rowspan="6">No Intervention</td></tr><tr><td>Brownfield attribute 1</td><td>Level</td><td>Level</td></tr><tr><td>Brownfield attribute 2</td><td>Level</td><td>Level</td></tr><tr><td>Brownfield attribute 3</td><td>Level</td><td>Level</td></tr><tr><td>Brownfield attribute 4</td><td>Level</td><td>Level</td></tr><tr><td>Cost</td><td>Level</td><td>Level</td></tr></table></td></tr>
<tr><td>Option 2 - Multiple site options with single ending state</td><td>Provides lots of variation in site choice.
The "warm-up" section survey will focus more heavily on aspects of brownfield sites.</td><td>Ending state must be held static across brownfield site types.</td><td>Preferences and values for site selection for development.</td><td>Some previously developed land is available for development within your area. Please select your preferred development option:
<table><tr><th></th><th>Status Quo</th><th>Option A</th><th>Option B</th></tr><tr><td>Visual</td><td>Visual</td><td>Visual</td><td>Visual</td></tr><tr><td>Attribute 1</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Attribute 2</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Attribute 3</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Attribute 4</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Cost</td><td>£xx</td><td>£xx</td><td>£xx</td></tr></table></td></tr>
<tr><td>Option 3 – "Pivot" or multi-stage discrete choice experiment design</td><td>Allows participants to directly compare two types of sites for development, and then outcomes for their selection.</td><td>High amount of cognitive burden, and the data collected may be less robust.</td><td>Preferences and values for site selection for development, as well as values for specific interventions to those sites.</td><td>Two sites are available in your area for re-development. Please select your preferred site, and then select which option you would prefer for re-development:
<table><tr><th></th><th>Site A</th><th>Site B</th></tr><tr><td>Visual</td><td>Visual</td><td>Visual</td></tr><tr><td>Brownfield attribute 1</td><td>Level</td><td>Level</td></tr><tr><td>Brownfield attribute 2</td><td>Level</td><td>Level</td></tr><tr><td>Brownfield attribute 3</td><td>Level</td><td>Level</td></tr><tr><td>Brownfield attribute 4</td><td>Level</td><td>Level</td></tr><tr><td>Cost</td><td>Level</td><td>Level</td></tr></table> → <table><tr><th></th><th>Status Quo</th><th>Option A</th><th>Option B</th></tr><tr><td>Visual</td><td>Visual</td><td>Visual</td><td>Visual</td></tr><tr><td>Attribute 1</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Attribute 2</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Attribute 3</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Attribute 4</td><td>Level – Status Quo</td><td>Level – Intervention A</td><td>Level – Intervention B</td></tr><tr><td>Cost</td><td>£xx</td><td>£xx</td><td>£xx</td></tr></table></td></tr>
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