Tackling Low Standards in Local Environmental Quality

GURU Electronic Working Paper 50

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Acknowledgement

Executive summary

People care deeply about their local environment and the appearance of their neighbourhood. Low standards of local amenity such as litter, graffiti, flyposting, flytipping, abandoned vehicles and dog fouling affect people's quality of life and their sense of wellbeing. The aim of this working paper is to review the evidence in relation to the following issues:

- The link between local environmental quality (LEQ) standards, deprivation and well-being
- The attitudes and behaviours of those who demonstrate 'nuisance' behaviour
- The costs, benefits and overall effectiveness of different approaches to tackling these, or similar, problems and bringing about behaviour change.

This working paper focuses on three categories of LEQ including: litter (and flytipping), graffiti, and flyposting. These have featured as issues of highest public concern in a recent opinion survey which has been undertaken for DEFRA. What follows are the key findings from the review with regards to the above three categories of 'environmental incivility'.

Littering and flytipping

Litter levels have remained stubbornly persistent over the last decade despite the fact that expenditure on street cleansing, including litter collection, has increased. Problems from litter and flytipping range from a simple eyesore, damaging the amenity value of open spaces, to a health hazard, and may even instigate a spiral of decline in an area.

New aspects of litter arise with changes in the law, business practices and social habits – thus fast-food littering and cigarette stub littering are more prevalent now than three or four decades ago.

Continued littering across many dimensions may be related to ignorance, particularly of more recent findings that establish wider environmental impacts of littering. It may also be harder for people to understand how small items of litter and those that are perceived as biodegradable can nevertheless cumulatively produce major environmental impacts.

People tend to imitate each other's behaviour, so once bad practices have become instilled, they become more widespread and harder to eliminate. Likewise, a perception of disorder may be likely to engender behaviours which can potentially aggravate this (see the findings of the study about the association between signs of disorder such as litter and graffiti and rates of smoking in the main report).

Rundown neighbourhoods also have an impact on people's mental health. Several aspects of littering and graffiti have an environmental justice dimension because as with many kinds of environmental burden, the most vulnerable groups may be more affected by these problems. In particular, older people, who are likely to spend more of their time in their neighbourhood, will have their quality of life significantly impaired by local blight and dereliction.

While there is a continued role – and evidence of success – for public education on a range of littering issues, this is an ongoing, rather than one-off, exercise that needs regular refreshment and reiteration across a range of media. Local authorities can contribute to abatement by providing and maintaining public disposal facilities – from appropriately-sited bins, generic or specific to particular types of litter, to household waste recycling centres. Littering is not just about the actions of the consumer; the companies producing, and the retailers selling, the packaged items that end up as litter also bear responsibility. Thus, pressure can be applied to producers to reduce the littering potential of their product with positive results, as in Australia. However, specific legislation -as in the case of the recent attempts at cigarette waste tax and alcohol litter levy in San Francisco and Scotland respectively - may be difficult to bring into effect.

To some extent, littering can be reduced by design interventions in packaging. However, there is no magic bullet and findings are sometimes counterintuitive, so each intervention needs to be trialled. While many dimensions of littering are linked and mutually reinforcing, each kind of litter repays individual investigation in terms of why it arises, the attitudes of those perpetrating it and what methods have been used to allay it.

Finally, some areas of littering are under researched and efforts to combat them would benefit from more formal study.

Graffiti and fly-posting

Graffiti is not a uni-dimensional phenomenon but relates to a range of different cultures and practices ranging from street art to vandalism. At one extreme are manifestations embraced by local neighbourhoods and incorporated into local identity, and at the other are territorial markings by gangs that may also engage in violent and criminal behaviour.

Fly-posting also has more and less offensive variants, but recent studies in England suggest it is mainly used as an informal kind of advertising. The bias towards advertising in fly-posting suggests the appropriateness of targeting businesses with education about the difference between advertising and fly-posting, and the negative impacts of fly-posting which include costs to Local Authorities of clearing it and its contribution to the impression of disorderly neighbourhoods, as with graffiti.

Graffiti is one of a number of 'environmental incivilities' that have been shown to increase both perceptions and the actual incidence of crime and disorder. A proportion of those involved in creating graffiti are motivated by the excitement of breaking the law involved in its creation. Some may move on to more serious offences, including assault and burglary, although limitations in the existing quantitative research mean that it is not yet possible to gain an accurate sense of the proportion who do so. Qualitative studies offer a more balanced picture of graffiti-ists by showing them as young people motivated by seeking an audience and recognition for creative expression and physical daring.

The continuum of graffiti invites a differentiated response by authorities that might even include selective permits. However, the experience of the city of Melbourne shows the importance of sensitivity and care in the introduction of such policies if they are not to be self-defeating. In suburban areas effective interventions may include measures to mitigate other signs of neighbourhood disorder, for example encouraging private property owners to better upkeep of house fronts. Simple prohibition notices in 'hotspots' for both fly-posting and graffiti may have the opposite impact to that intended.

1. Introduction

1.1 The working paper

People care deeply about their local environment and the appearance of their neighbourhood. The quality of local environment affects our quality of life. This working paper aims to explore the link between LEQ and deprivation and between LEQ and wellbeing by reviewing the available evidence. It also aims to review the evidence on what works in bringing about behaviour change and tackling the problems of low standards in LEQ. It will do this by exploring the following:

- The link between LEQ standards, deprivation and well-being;
- The attitudes and behaviours of those who demonstrate 'nuisance' behaviour;
- The costs, benefits and overall effectiveness of different approaches to tackling these, or similar, problems and bringing about behaviour change.

The above key objectives have been used to structure the report which includes five main sections. After this introduction, section 2 focuses on the link between LEQ standards and wellbeing. Section 3 explores the links between LEQ standards and deprivation. Section 4 centres on 'nuisance' behaviour' and section 5 on effectiveness of measures for bringing about change.

Over the past decades annual surveys have been carried out for DEFRA by the organisation Keep Britain Tidy (KBT) to monitor progress on achieving higher standards of LEQ. The most recent survey reports the results for seven LEQ categories including: litter (food and drink packaging, carrier bags, cigarette-related litter, drug-related litter, dog-fouling); graffiti; flyposting; detritus; staining (mainly chewing gum); leaf and blossom fall; and weeds. Given the need to limit the extent of the literature reviewed for this working paper, we have chosen to focus on the first three categories of LEQ (litter, graffiti and flyposting). These have featured as issues of highest public concern in the most recent opinion survey (KBT, 2009).[1]

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[1] Some definitions of LEQ also include noise and odour. However, these have also been set aside as sizeable topics in their own right, and outside the scope of this review.

1.2 Litter

The Environmental Protection Act 1990 (s.87) defines litter as *'anything that is dropped, thrown, left or deposited that causes defacement, in a public place'*. It includes a wide range of items such as smoking related litter (cigarette ends and packaging), chewing gum, food and drink litter (especially fast food packaging), drug related litter (such as used syringes), carrier bags, and faeces (especially dog fouling). Litter levels have remained stubbornly persistent over the last decade - some 15% of sites are unsatisfactory or poor for litter, just 3% less than in 2001. This is despite the fact that expenditure on street cleansing, including litter collection, of £885m in 2009/10, has nearly doubled in comparison with ten years ago (DEFRA, 2012: brief).

A distinction can be made between litter and flytipping according to their size and scale. Both refer to items that have been discarded outdoors in the wrong place, but while items of litter are small in size, flytipping is about either large accretions of such small items or bulky items of waste such as, fridges, garden waste, and abandoned cars. Flytipping often results from individuals or contractors displacing waste materials from a domestic or commercial setting at the lowest possible cost to themselves. It is an environmental burden that affects both advantaged and disadvantaged areas, although a recent study (see Section 3 below) found flytipping of the 'bulky household waste' variety to be particularly concentrated in disadvantaged areas. The SDRN report (2004:9) notes that it may have been caused or aggravated in many cases by waste management legislation that requires people to make a payment for disposing of certain kinds of waste. Problems from litter and flytipping each continue along a similar scale of gravity from a simple eyesore, damaging the amenity value of open spaces, to a health hazard, that may even instigate a spiral of decline in an area. A 2002 report by the ODPM entitled 'Living Places' notes that vermin and disease may be attracted by litter and rubbish and that they may drive people, business and investment away (ODPM, 2002:11-12). In the future, the climate change-induced urban heat island effect has the potential to exacerbate the problem of vermin and disease.

Much of the research on littering dates from the 1970s and 1980s when some of the most common forms of litter now found, such as cigarette stub litter, fast food packaging and fly tipping were less prevalent. The available research is from all over the world and is split between generic investigations of all types of litter and policies that have been put in place to deal with it; and focused investigations of specific types of litter. For reasons that may be related to local policy agendas in the country where the research took place, some sub-types of litter are largely under-

researched, while others are the subject of numerous investigations. For example, while there is a great deal of research on food and drink packaging from many different countries, there is little on flytipping and dog fouling.

1.3 Graffiti and flyposting

In Britain, graffiti is one of the behaviours targeted by Anti-Social Behaviour legislation (that also covers littering, flyposting, spitting, public drunkenness and similar behaviours). However, we concur with Austin and Sanders (2007) that '[G]raffiti is not unidimensional, as it is sometimes portrayed in the popular media and in some academic research'. There is a continuum, with at one extreme, formal community arts projects that allow participants to use available public surfaces for sanctioned murals and 'street art'. An intermediate case is the informal appropriation of urban surfaces by perpetrators who may consider their work to be self-expression – this has sometimes been characterised as 'hip hop graffiti', linking it to a dance and music style, but extends beyond this to widely-recognised graffiti 'stars' whose work is celebrated – and conserved – as contributing to the creation of place identity, such as Banksy in Britain, Sixten in Melbourne and Germany and Blek Le Rat in France. Graffiti can be a medium for political and social commentary, as famously in the city of Derry in Northern Ireland, or can mark out a cultural space or assert individual identities, in particular where there is little other outlet for youth participation (Ferrell, 1997; McCormick, 2003). At the other extreme of the spectrum, graffiti may represent territorial marking by a gang (for example with the use of threatening faces, gang names, identifying 'tags'), or to advertise informal or illegal services and activities. A section of the literature is particularly concerned with this ambiguity between different kinds of graffiti, and some studies have shown fascination with the cases where graffiti may be considered a positive contribution to the urban experience in spite of its illegality. This review, however, focuses mainly on the 'nuisance' side of graffiti that is associated in people's minds with neglect, disorder and criminal activity.

A formal definition of flyposting has been offered by the organisation Keep Britain Tidy as follows:

> "Fly-posting is defined as any printed material and associated remains informally or illegally fixed to any structure. Fly-posting includes any size of material from small stickers up to large posters, often advertising popular music recordings, concerts and other events." (KBT, 2012a, 31).

Like graffiti, it can be seen as having more and less pernicious variants, although it is harder to see these as being organised along any kind of continuum. The variants include cheap ways of publicising low budget community events and activities, calculated PR campaigns by larger concerns targeting youth including big corporations such as Sony (KBT, undated), advertising for informal or even illegal business activities and announcements by minority political and pressure groups. The problems related with flyposting include the costs of removing it; the impression of neglect and abandon it can contribute to an area, particularly where surfaces acquire accretions of torn and decaying posters; as well as the occasionally offensive content of flyposted materials, which by definition are outside the control of the Advertising Standards Authority.

While graffiti has been the subject of large scale research studies, particularly in Australia and New Zealand, there is very little research specifically on the topic of flyposting.

1.4 The broken window effect

Another important problem that can be included in LEQ relates to empty and derelict buildings. These can lower the standard of LEQ because of their impact not only on the appearance of the neighbourhoods, but also their multiplier impact through what is known as the 'broken window theory'. This means that once problems such as empty or derelict buildings, litter and flytipping and vandalism take hold, they can have self-reinforcing consequences, attracting anti-social, illegal and unhealthy behaviours (first proposed by Wilson and Kelling, 1982 and its implications developed by other authors; see for example Cohen, 2000). It is argued that such conditions will drive away anyone in a position to relocate. When people move out of a blighted neighbourhood, it may be hard to find new occupants for the homes left behind. This can lower property values, rents and 'eyes-on-the-street', further entrenching the problem. Environmental and social disorder can join together in a self-perpetuating spiral of decline. While empty and derelict buildings are not covered in this report, other issues can have similar cumulative and self-perpetuating effects. For example, litter can attract more litter (litter-on litter syndrome) calling for the urgency of effective policies to reduce and remove it.

2. Local Environmental Quality Standards and Well-being

2.1 Introduction

Poor quality neighbourhoods can have a range of impacts on people's wellbeing, depending on the nature of the blight and the meanings and values that people attach to the quality of places in which they live and work. Therefore, the link between the quality of the local environment and people's quality of life is to some extent contingent on what the local environment means for people's identity, culture and circumstances. For example, while some consider Banksy's work as graffiti, others may see it as street art and a contribution to uniqueness of place.[2] In this report we focus on the widely agreed negative effects of what are called 'environmental incivilities' (Ellaway *et al.,* 2009) referring to those aspects of the environment that make up a poor quality neighbourhood irrespective of the above contingency. Ellaway *et al.* (2009) have found evidence of the links between these incivilities and poor mental health outcomes. Their study found that people with a perception of high levels of 'street-level incivilities' (litter, graffiti, dumped cars/fridges, broken glass, uneven pavements) were more than twice as likely to report frequent anxiety and depression than those who perceived low levels of these problems. Keep Britain Tidy found an association with the sense of safety: "Members of the public, who are satisfied with how their area looks, are significantly more likely to be satisfied with how safe they feel in their area" (KBT, 2009). As with many kinds of environmental burden, the most vulnerable groups may be more affected by these problems. In particular, older people, who are likely to spend more of their time in their neighbourhood, will have their quality of life significantly impaired by local blight and dereliction (Bowling *et al.,* 2006; Mottus *et al.,* 2012).

The following two sub-sections will review wellbeing issues that are connected with the different kinds of litter and with graffiti and flyposting.

2.2 Litter and well being

Every year, over 30 million tonnes of litter are collected from the streets in England at the cost of £885 million to local councils. Two and a quarter million pieces of litter are dropped in the UK every day (Symphony Environmental Study 2005, quoted on KBT website). Different types of litter have

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[2] For example, the attempt by Bristol City Council to remove Banksy's 'naked man' graffiti from the wall of a health clinic in Park Street in Bristol was strongly opposed by the local communities who considered it as adding to the uniqueness of their locality. The City Council decided to withdraw their decision.

different kinds of wellbeing impacts as discussed below in relation to: food and drink packaging, cigarette-related litter, drug-related litter, dog fouling, and flytipping.

2.2.1 Food and drink packaging[3]

There has been a 20% increase in the prevalence of fast food litter in England over the first decade of the Keep Britain Tidy surveys to 2011 (KBT, 2012b, p.45). Fast food litter is the fastest growing type of litter in many countries (Roper and Parker, 2012). Another common type of packaging litter is alcohol-related. This can be dangerous to health in its own right, in terms of injury from broken glass containers, and contributes to an impression of neglect that can lead to a self-reinforcing spiral of decline and reduce residents' feeling of wellbeing (Cummins *et al.*, 2005). Given the link between alcohol-related detritus and deprivation (as suggested in section 3 of this report), it can be seen as adding a hazard for children playing outdoors in deprived areas as well as supplying ad hoc dangerous weapons in situations where violence breaks out (McKinlay *et al.,*2009, cited in Forsyth and Davidson, 2010, p356).

2.2.2 Cigarette-related litter

The Encams on-the-ground surveys of Local Environmental Quality show that cigarette related litter is the most prevalent kind in England and has been since the survey began in 2001/2. Over the decade it has also risen by 20%, so that in the most recent survey it affected 69% of sites. The relationship with the introduction of the indoor smoking ban in 2007 is not a straightforward one, in that cigarette litter actually declined the year after the ban was introduced (KBT, 2012a); however, this coincided with a campaign that year against cigarette litter. Strong rises in the last two years seem in line with evidence from countries which have had the ban for longer, such as Australia, Scotland, Ireland and America, to the effect that prompting people to smoke outdoors increases the prevalence of litter from smoking.

In the US, it has been estimated that cigarette-related litter comprises between 22% and 36% of all visible litter and 28% of all litter recovered from beaches and coastal areas (Schnieder *et al.*, 2011). Cigarette stubs are the most common component of this litter, tending either to accumulate where deposited or to wash through to other areas via gutters, culverts, drainage and sewer systems. Studies are beginning to show their harmful impact on the environment, including being a source of metal leachate that can cause acute harm to local organisms (Moerman and Potts, 2012). Metals

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[3] Due to time and resource limitations it has not been possible to give separate consideration with in this category to carrier bag litter, although there is an extensive literature on this topic.

from smoking tobacco such as arsenic, cadmium and toluene get trapped in the filters and then wash into the water system (Smith and Novotny, 2011; Rath *et al.*, 2012). A study found that just one cigarette stub suspended in a litre of water killed half the fish exposed within (Slaughter *et al.*, 2011). Marah and Novotny (2011) report many other studies that establish cigarette stubs' toxicity.

The non-biodegradable element of the cigarette filter, made of cellulose acetate, also tends to be washed away from the litter source, to become a common source of beach litter – a study by the Ocean Conservancy NGO reports filters to be the single most collected item found in beach clean-ups each year (cited in Novotny *et al.*, 2009). Another study estimates the volume of waste from filters deposited each year globally to weigh over 750,000 metric tons (cited in Smith and Novotny, 2011). In a review of studies by Smith and Novotny (2011) of attitudes to smoking, it was found that both smokers and non-smokers find cigarette-related litter offensive. Smokers themselves found stubs malodorous and dirty. Indeed, part of the reason for littering was to get these offensive items away from the person as quickly as possible. They also did not like to be confronted with the evidence of their habit in the form of the litter they had created. Research on biodegradable filters suggested people would be glad of an innovation that removed the eyesore of cigarette litter faster. Among non-smokers, however, some believed littering by smokers to be deliberate, whereby people banned from smoking indoors by new legislation intentionally used littering outside buildings as a form of protest (Smith and Novotny, 2011: 4). In a study of a smoke-free policy in Minnesota Parks, the top reason for supporting the policy, selected by 71% of respondents, was to eliminate cigarette-related litter (Klein *et al.*, 2007), suggesting a strong impression of blight caused by cigarette related litter in public amenities.

2.2.3 Drugs-related litter

The phenomenon of drugs-related litter in communities is a relatively recent one (Philipp, 1993), but studies since 2001 have found it to be on the increase, alongside increasing awareness of it among UK local authorities (Blenkharn 2008; Blake Stephenson Ltd., 2010). There is a high level of anxiety about injuries and infection arising from needles for illegal drug use that are discarded in the community. This is reflected in the fact that drugs-related litter was viewed by the public as 'most important for spend' of all types of litter (and irrespective of whether it was actually perceived to be a major problem locally) in a recent major survey of public perceptions about litter (KBT, 2009: 18). Children are thought to be most at risk, because of their greater likelihood of contact with drugs litter, either through intentional manipulation or through accidental contact when playing.

It is well-known that intravenous drug use carries a high risk of Hepatitis B, Hepatitis C and HIV. One study in Montreal, Canada, found respective rates of infection among those injecting illegal drugs to be 48%, 65% and 16% respectively (Papenburg *et al.*, 2008). While it has been clearly proved that blood-borne viruses can survive in discarded needles (Thompson *et al.*, 2003, Nyeri *et al.*, 2004) studies have shown that transmission of disease through such injury is in fact very low. In the largest study to date of 'Community-Acquired Needle Stick Injury' Papenburg *et al.* (2008) followed up 274 paediatric patients over 19 years. The study recorded no incidence of transmission of disease, results that supported many previous smaller studies in Europe, the US and South Africa, which equally reported no transmission of virus among all their samples (ibid: 489). The authors nevertheless stress that just because they found no viral transmission, this does not mean the risk is zero: it remains between 1 and 2% for each of the main viruses concerned. They also mention a number of attested cases where infection has been passed on in this way. However, the high levels of anxiety raised by needle stick injuries and the costs of investigating (and occasionally treating) diseases such as Hepatitis B and C, or HIV, associated with intravenous drugs use, indicate the negative impact of this kind of litter on people's sense of well-being.

2.2.4 Dog-fouling

> "In 2010 the UK dog population was estimated to be 8 million, with dogs producing approximately 1,000 tonnes of excrement each day. In a recent survey of over 10,000 sites dog fouling was present on 7% of these sites. Some dog owners still fail to clean up after their dogs and the highest level of dog fouling can be found in areas where people actually live." (KBT website, accessed 12/11/2012).

Dog fouling can have two main well-being impacts. One is the risks from roundworm infection that arise from exposure to dog faeces, and the other one is risk of slips, trips and falls causing injury. Children between 2 and 4 are at the greatest risk of infection from the 'toxocara canis' roundworm – coincidentally a group that is particularly likely to come into contact with dog faeces because of playing in outdoor spaces and more frequent tumbles and falls. Although fewer than 10 newly diagnosed cases are reported to the UK Centre for Infections per year (Atensteadt and Jones, 2011), the impacts can be severe, ranging from fever to loss of visual acuity (ocular syndrome). In terms of falls, no data is currently collected on the causes of falls outdoors, so it is impossible to estimate the numbers of falls due to dog fouling. Above and beyond these two main hazards, dog fouling is a cause of visual offence and is one of the highest sources complaints to local MPs and councils (KBT, 2012a).

2.2.5 Flytipping

Flytipping can come from commercial or domestic sources; about 50% is from the latter (Carpenter, 2008), with clearance costs of £73 million for the period between 2006 and 2007 (DEFRA, 2008). Flytipping from domestic sources most commonly consists of the 'bulky household waste' variety which accounts for around 5% of household waste produced annually in the UK (Curran *et al.* 2006, cited in Hodsman and Williams, 2011). The council definition of 'bulky household waste' is that it includes any large items you would normally take with you when moving house. According to the Controlled Waste regulations (1992 and 2012), authorities are allowed to charge for the removal of any item of 25kg or more and one which does not fit into a cylindrical container 750 mm in diameter and 1 metre in length (TSO, 1992 and 2012). At the time of Curran's report, 72% of authorities charged for the removal of such waste. Probably in consequence of this the majority (60%) was discarded by the householder themselves at household waste recycling centres. People also use other legitimate means of disposal such as private sales, charities, eBay or free distribution such as Freecycle and private rubbish collecting firms. However, a small proportion of bulky household waste is disposed of by flytipping. There is little research on this issue, in spite of the fact that the impacts on well-being are considerable. Among the problems attributed to this kind of litter is soil contamination, the attraction of crime to the neighbourhoods affected, greater fear of crime and less inward investment (Webb *et al.*, 2006).

2.3 Graffiti, Flyposting and well being

Halsey and Young in 2006 stated that $6.8 billion is devoted internationally each year to removing graffiti (p.292). Poorly maintained, graffiti-ed neighbourhoods are likely to impact on people's physical wellbeing by discouraging walking, often intermediated through the way that physical disorder in a neighbourhood increases fear of crime (SDRN, 2004). In a European study, residents in neighbourhoods with high levels of litter, graffiti, dog fouling and other signs of disorder were far less likely to be physically active than those in areas with better order and more vegetation and greenery (Ellaway *et al.* 2005). Complementing these findings with a focus on youth, a study in Canada found that in neighbourhoods with both high social and physical disorder including graffiti, young people were 40-60% more likely to have high levels of screen use such as television, play station, and computer (Carson and Jansson, 2012). Similar impacts can be extrapolated for fly-posting.

3. Local Environmental Quality Standards and Deprivation

3.1 Introduction

A study undertaken by Davoudi and Brooks (2012) that investigated the distribution of 'rundown neighbourhoods' in Newcastle City found that wards that are lower-performing in terms of neighbourhood standards more or less coincide with the wards that have a higher disadvantage rating on the Carstairs deprivation index (see Figure 1 below). The finding is based on data collected by Newcastle City Council for its composite Local Environmental Quality Indicator. However, examined in detail, the differences between wards are not great, with the lowest scoring areas still achieving an overall quality rating of 87 out of 100. According to the information supplied with the data, the rating is based on inspection of multiple parts of the ward, administered three times per year. The 16 dimensions measured include litter, vandalism, flyposting, flytipping, graffiti, weeds, street furniture and dog fouling. There is a guarantee that at least 270 separate areas of Newcastle will be inspected per year. The score therefore represents the percentage of inspections that were passed in any one year. For several components of the standard (such as roads, pavements, street lighting) basic standards are set out in service agreements with contractors as conditions for payment. This could be linked to some of the strong positive ratings for the 2010-2011 period, prior to the introduction of Decent Neighbourhood Standards in the city. Another reason for the relatively small discrepancies in environmental quality between different areas of the city is that the city is already inputting supplementary levels of resource, such as a more frequent street cleaning service, to maintain standards in disadvantaged city neighbourhoods. The more intensive street-cleaning services were provided at the neighbourhood levels in which services can be targeted at particular problem streets within wards.
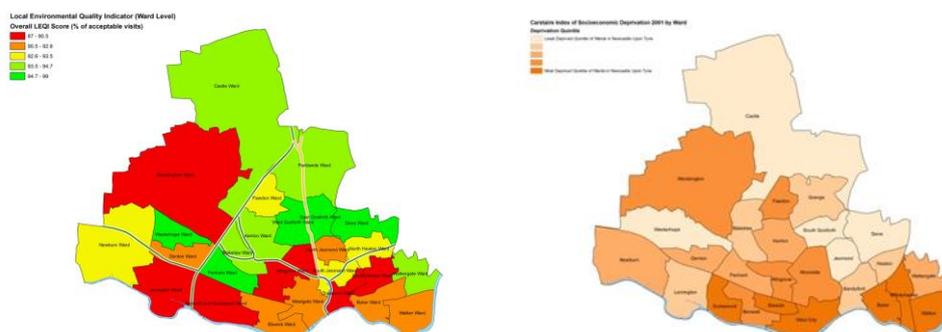
Figure 1 Local Environmental Quality in Newcastle 2010/11, compared with Carstairs deprivation index (2001) (post-2004 wards in right-hand map; pre-2004 wards in left-hand map. Darker areas on the left are those with lower environmental quality; and on the right, with greater deprivation)
Source: Davoudi and Brooks, 2012, p. 57, Figure 5.7

The following two sub-sections will review the link between deprivation and different kinds of litter, graffiti and flyposting.

3.2 Litter and deprivation

Quoting the English House Condition Survey, Power (2004) identified dumped litter as a problem for about 2 million people in England. According to Duffy, 2000, not only did people in more deprived areas have lower than average levels of satisfaction with street cleaning in their area but also local authorities in deprived areas had generally lower standards of street cleaning and refuse collection. However, as noted above, some local councils tend to provide more street cleansing in deprived areas than in affluent ones in order to maintain LEQ standards (Davoudi and Brooks, 2012).

The results of an in-house analysis for an annual national survey of environmental quality undertaken by ENCAMS – which reviews a sample of local authorities based on a range of geographical and deprivation criteria – were inconclusive about the association with deprived areas (SDRN, 2004). However, a later study by ENCAMS (2009) was able to establish an association between both the perception and (although to a lesser degree) the reality of poor LEQ standards, including littering, and area deprivation in London. An initial study by the Joseph Rowntree Foundation (JRF) also established an association between littering and deprived areas (Hastings *et al.*, 2005). Four years on, JRF found that people living in the most deprived neighbourhoods were twice as likely to perceive problems with Local Environmental Quality (such as littering) in their neighbourhoods as those in better-off areas (Hastings *et al.*, 2009). The study backed up this investigation of perceptions with an on-the-ground survey of 40 local authorities, from which they were able to establish that, in line with the perceptions of residents, the most deprived authorities also had worse littering and lower levels of street cleanliness.

Of equal significance to the perception and incidence of littering is the degree of concern it raises among people in deprived areas. For example, Burrows and Rhodes (1998) found that while high levels of dissatisfaction were found in all housing tenure groups, the highest concentrations were found in wards with the following classifications: social housing in London, high rise housing, deprived industrial areas with large minority ethnic populations and areas of low amenity housing in deprived areas. The SDRN study (2004:19) cites three qualitative studies from the UK that show litter is high on the list of concerns expressed by people living in disadvantaged areas.

The association between different types of litter and environmental deprivation is discussed below in relation to: food and drink packaging, cigarette-related litter, drug-related litter, dog fouling, and flytipping.

3.2.1 Food and drink related litter

In a small-scale Scottish study (that could be helpfully expanded and perhaps extended to explore the environmental justice dimensions of cigarette-related littering) an investigation of alcohol packaging litter began with the hypothesis that it would be most prevalent near to sales outlets (Forsyth and Davidson, 2010). However, findings showed that while there was a small effect in this direction, there was a far stronger link with local area deprivation, indicating a strong 'environmental justice' dimension to this kind of littering. The effect was particularly marked when glass bottle littering was considered in isolation from other kinds of alcohol-related detritus.

3.2.2 Cigarette-related litter

A study in the US using GIS systems to track the prevalence of cigarette-related litter in an urban setting found that concentrations of such litter are found where cigarettes are sold and consumed. The seven main locations identified by a street-litter volunteering group were as follows: "bars, convenience (7-11 type stores) and liquor stores, cafes (such as Starbucks), gas stations, grocery stores, restaurants and traffic signal-guarded street crossings" (Marah and Novotny, 2011). This suggests that the link between places of purchase and consumption could be higher than any link between cigarette litter and deprivation. However, many studies have shown that living in a disadvantaged neighbourhood influences the likelihood of engaging in smoking behaviours (above and beyond individual characteristics such as age, gender, personal education, employment status, household income and mental health). Perceived liveability and social cohesion has also been shown to have an effect on smoking (as reported in Miles, 2006). Miles' own original research across seven European cities found that people in neighbourhoods with a high 'disorder' rating (based on the observation of variables including litter, graffiti and the absence of vegetation on facades, balconies or windows) were 64% more likely to smoke than those in neighbourhoods classified with a 'low' disorder rating. When examined along gender lines, the effect was even greater for men than for women. This backs up other studies in suggesting that the effects of litter and graffiti may likely to be circular, provoking a degree of environmental stress that engenders forms of behaviour with potential to increase the ambient disorder.

3.2.3 Dog-fouling

While it is unclear whether dog fouling has an environmental justice dimension (i.e. having a disproportionately higher impact on deprived areas or social groups), it is clear that it is the kind of blight that could lead to a cycle of decline in an area, for example by discouraging passing trade, tourism and inward investment, as the area is seen as dirty and undesirable. A further detrimental consequence on population health is possible as dog excrement may discourage people from using outdoor areas for the purpose of exercise, to the detriment of their physical health (Atenstaedt and Jones, 2011).

3.2.4 Flytipping

The UK government has run a national fly-tipping database in order to identify and target hot spots. The database, called Flycapture, uses Local Authority and Environment Agency monthly returns to document incidents, include the number, size, location and waste types of flytips. A study carried out in one English county found that bulky household waste flytipping was significantly more likely to occur in areas of high deprivation than those of average or low deprivation (at a greater than 95% confidence level) (Hodsman and Williams, 2011).

3.3   Graffiti, fly-posting and deprivation

Graffiti and fly-posting tend to sit alongside other signs of disorder such as littering in exacerbating the perceived unsafe status of disadvantaged neighbourhoods. A direct link between disorderly neighbourhoods and higher crime rates (as implied by Wilson and Kelling in 1982 in what has been labelled the 'broken windows' theory, discussed in Section 1.4) has been questioned in some studies, but the link between 'incivilities' in a neighbourhood and negative resident perceptions has been widely demonstrated. Concern over a disorderly neighbourhood and a fear of crime tend to come together, because it seems that residents may read the disorder as a sign of crime and criminal behaviour. It may seem as if social control in the neighbourhood is breaking down (Ross and Mirowsky, 1999). In the case of illegal graffiti, this association is literally true, as a crime has already been committed in its creation. Its presence may suggest to residents that other crimes are more likely to take place in the future (Austin and Sanders, 2007). To a lesser degree, this impact can be imputed to fly-posting which falls under the Anti-Social Behaviour Act, 2003 and for which offenders (the people posting, rather than organisations advertised) can be given on the spot fines of £75; while the maximum penalty has been increased to £2,500 (KBT, undated).

Some studies have shown that the subjective perception of crime associated with poor housing and neighbourhood conditions is actually backed up by objective measures of crime taking place (e.g. Austin *et al*, 2002). In other words, the environmental justice implications of graffiti are not just raised levels of fear in the community, but an actual association with higher crime levels.

Although certain individual characteristics, like race and having been a victim of crime in the past, have been shown to impact on people's fear of crime, some research has shown that neighbourhood disorder (perceived on the basis of, for example, trash and litter, graffiti, loose dogs, vacant houses, noise, people drunk/high in public, abandoned cars, and unsupervised youth) influences the fear of crime more strongly than demographic characteristics (Dowler, 2003). Those attempting to theorize the link between perceived disorder and crime have found links with a decline in feelings of collective efficacy (Gibson, *et al.*, 2002), an erosion of social ties (Ross and Jang, 2000) and an impact on satisfaction with the community (Ladewig and McCann, 1980).

At the level of the individual, the fear of crime can generate anxiety, depression and greater caution in using the outdoor environment, which itself can lead to health problems. If fewer people feel safe to, or are well enough to, go outside, this can also exacerbate the problems of a community's 'loss of social control' (Ross and Mirowsky, 1999).

At a more basic level, there is some evidence that seeing clearly illegal activity such as graffiti in an area can prompt people to abandon other norms, such as that against littering. In other words, not only, as established by Cialdini *et al.* (1990, 1991), are people more likely to litter in a littered setting, but they are also more likely to litter in a non-littered setting which displays norm-violating behaviours such as graffiti. Social psychologists have attempted to explain this as relating to a theory of three kinds of goals that people pursue, which can be briefly summarised as gain, enjoyment and conformity. The last type of goal is the weakest and needs cues that others are also conforming to norms in order to support compliance. Their study shows that where the setting demonstrates clearly that others have disregarded norms, as in the case of graffiti, people are less inclined to obey other kinds of prohibitions (Keizer, *et al.*, 2011).

4. 'Nuisance Behaviour'

4.1 Introduction

This section focuses on the attitudes and behaviours of those who demonstrate 'nuisance' behaviour such as littering, graffiti writing and flyposting.

4.2 Litter and nuisance behaviour

Although it is illegal to drop litter in public spaces, 48% of the population who took part in a survey undertaken by Litter Segmentation in 2006 admitted to dropping litter (KBT website). Wells' (2006) research on littering (i.e., the dropping of nonfaecal waste such as sweet wrappers and cigarette stubs) indicates that this kind of behaviour is significantly related to demographic factors (e.g., age, gender, socioeconomic status). Thus, men are more likely to drop litter than women, the young (aged 30 and below) litter considerably more than higher age groups, and there is more littering by people on low incomes than from higher income groups (e.g., Durdan, Reeder and Hecht, 1985; Finnie, 1973). These links may vary according to different types of litter, as discussed below in relation to: food and drink packaging, cigarette-related litter, drug-related litter, dog fouling and flytipping.

4.2.1 Food and drink packaging litter

A study in Australia (Williams and Scholz, cited in Wever *et al.,* 2010) found that the nature of the packaging litter had a major influence on people's decision about whether or not to bin it. It found that:

> '. . . many people consistently littered some objects but binned others. Cigarettes, organic items, and very small objects were more likely to be littered than other objects. The type of object and the way in which the person perceives that object once its initial use has been completed has an impact on how they dispose of it. For example, PET bottles tended to be reused and carried by many people while food wrappers – particularly once they were wet – often became messy and were disposed of quickly' (Williams and Scholz, 1997, cited in Wever *et al.*, 2010, p.241).

4.2.2 Cigarette-related litter

The tobacco industry has invested in a great deal of research in the attempt to establish smokers' responsibility for littering. A review of research by the tobacco industry on smoker's attitudes showed that most smokers knew that filters were not bio-degradable, although some clung onto the (false) belief that Camel cigarettes did have degradable filters (Smith and Novotny, 2009). However, most smokers were not aware of the environmental impact of cigarette waste, and appeared oblivious to the harmful toxins released into the environment by discarded stubs. Focus groups held to generate solutions to the cigarette stub problem found that although smokers disliked seeing stubs in their own yards and ashtrays, they were not concerned about the impact of stubs when washed into the wider environment (ibid.: 3). The findings from the tobacco industry research were also reviewed with regard to what percentage of people discard their cigarette stubs as litter. Estimates ranged from 45% to 73%. Looking at specific age ranges, one study estimated that 92% of those aged 21-25 engaged in this behaviour, corresponding with earlier studies which found littering to be generally related to younger age groups (e.g. Robinson, 1976).

A US survey of attitudes among 1,000 smokers found that the main connection with littering behaviour was the belief that cigarettes are not litter (Rath *et al.*, 2012). This prompted the researchers to propose that educating the public with regard to the environmentally harmful nature of cigarette waste should be the main focus of future campaigns. When reasons for littering were probed in qualitative studies, some felt it was part of the whole rebellious cigarette culture to toss a stub to the ground and stamp on it, but others regarded this as an important safety measure to prevent fire risk and gave this as a reason why cigarettes should not be discarded into waste bins. In focus group studies, smokers expressed the view that it was comparatively socially acceptable to discard cigarette stubs, unlike littering bottles or cans, and that stubs were not regarded as causing significant harm to the environment (Smith and Novotny, 2011). These attitudes were borne out by studies into the prevalence of littering around permanent ashtrays installed in places where people were likely to smoke outdoors. Many cigarette ends were found within 5 metres of a bin and about half of smokers said that they would not bother to use a bin which was more than 10 paces away. Another problem was that many smokers did not notice bins that had been placed in convenient locations for their use.

The tobacco industry's attitude towards the litter generated each year by its patrons was also seen worthy of targeting in an article by Smith and Novotny (2011). The study noted that filters are primarily a marketing tool rather than the safety measure most smokers assume them to be (and

may even be responsible for a rise in certain types of cancer resulting from smoking). Solutions such as biodegradable filters had been tried but ultimately rejected by the industry. Thus tobacco control and environmental agencies need to join forces to persuade tobacco companies to take responsibility for the harmful waste produced by their product.

4.2.3 Drug-related litter

The advisability of separate bins for drugs-related litter has been investigated in several studies and found to have an important impact on reducing littering of dangerous equipment such as needles. However, a qualitative study by Parkin and Coomber (2011) showed barriers among drug users to using the dedicated drugs waste disposal bins that some local authorities provide. While around half the 51 users interviewed across two (anonymised) cities were in favour, some were indifferent claiming not to need bins as they disposed of needles safely at home. The bins in the study were differently designed and placed in each site. In the first sites, bins were unlabelled and in discreet alley-way locations. Nevertheless, of those against using the bins in this city sample, some thought using the bins risked revealing their user identity in public. Only four out of 31 of those interviewed in this location had ever used the bins. Some claimed the bins were not in current drug-using sites, which had been abandoned due to police crack-downs, and would have preferred them to be located in buildings such as public toilets and car parks. One claimed the lack of labelling (a conscious policy on the part of the local authority) meant they would be hard to identify by drugs users.

The design of the bins in the second city site seemed to overcome many of these difficulties as the bins were located next to non-hazardous waste bins in public toilets which had been identified as sites of high drug use. The bins were labelled with symbols, words and Braille as for hazardous waste of any kind. Thus, legitimate injectors such as diabetics using insulin and illegal drug users were not discriminated between in the disposal of used equipment. In this case, 17 out of the sample of 20 drug users interviewed knew about the bins. There was consensus that the bins were a valuable and useful resource. However, because the provision of bins in the toilets was also combined with an increase in police presence outside the toilets, some also saw these bins as a form of 'entrapment', believing them to be linked with CCTV surveillance that allowed officers to arrest those using drugs when they emerged from the toilets. The study concludes that rolling out the integrated hazardous and non-hazardous bins in all public toilets could avoid concentrated sites of intravenous drug use and should be accompanied by a programme of outreach by drugs agencies rather than police

enforcement, so that the policy towards drugs use presented a less contradictory face to users and others.

4.2.4 Dog fouling

A small-scale study in England of the social psychology of those who let their dogs foul and those who behave responsibly tried to establish if a self-centred approach could be behind the difference, as in other law-breaking behaviours. In fact they found that this was not the case and the only clear difference between the two groups was their attitude to dog faeces, the irresponsible group being more inclined to view it as natural, biodegradable and unproblematic (Webley and Sitiver, 2000). The study also found that fouling was more likely to occur on pavements than in parks, and that people were generally unaware that the majority of people clean up after their dogs. This suggested to the authors the need for more public education about the dangers due to dog fouling, and the proportion of people who behave responsibly.

However, a later study in Northern Ireland, with a larger sample (Wells, 2006) taking place exclusively in parks, all of which were equipped with bins and waste disposal bags, found that only a weak majority (53.5%) of owners cleaned up after their dogs. Furthermore, fouling behaviour was correlated with all of variables investigated (the exception being age): more males, those on a lower income and those who let their dogs off the leash, did not clear up after their dogs. The author cites research to the effect that, typically, those with lower annual income have been shown to have less concern for environmental issues than those with a higher annual income (e.g., Franzen and Meyer, 2004; Worsley and Skrzypiec, 1998; Yilmaz, Boone, and Anderson, 2004). Wells' study (2006) was, however, the first to show that individuals with a lower income also have a lower regard for the environmental issue of dog fouling. The author therefore calls for targeting educational programmes to these groups and introducing more stringent leash laws, so that owners are more aware of their dogs' behaviour.

4.2.5 Flytipping

A survey responded to by 219 householders on the perceived reason for fly-tipping household waste in the county of Hampshire found that the main reasons put forward were the lack of a nearby Household Waste Disposal Centre, the cost of legitimate disposal, and the lack of deterrent and enforcement (Hodsman and Williams, 2011). Other reasons put forwarded included laziness and ignorance on the part of the flytippers. For various reasons, including the small numbers prosecuted for this offence, it is likely to be difficult for a future research study to get far beyond this and

discover the motivations of the flytippers themselves. Based on a small number of interviews with local authority officials, Davoudi and Brooks (2012) suggest that effective enforcement is hampered because of the limited reporting of the offence which itself is sometimes due to fear of reprisals for complaints, particularly in deprived areas.

4.3 Graffiti and Flyposting and nuisance behaviour

Graffiti-writing is generally accepted to be predominantly young, male activity. For example, Rowe and Hutton's study found that over half of male respondents had engaged in graffiti-writing, whereas the figure for female respondents was less than one quarter (Rowe and Hutton, 2012, p.76). Motivations are varied: "for some it was strictly art, for others a vandalistic thrill, for others a means to communicate one's worth" (Snyder, 2009: 9). A study of three year offending histories of those convicted for graffiti offences which was extracted from the Police Records for Western Australia (Taylor *et al.*, 2012) found that graffiti writing is mainly something done by adolescents between 14 and 17 years of age, with a peak age of offending at 15 years.

In their 2006 study, that focuses on 'the complex of motivations for graffiti writing and the sense of cultural belonging graffiti can generate for young people', Halsey and Young (2006) claim that this is an under-researched area. Their qualitative interviews with 44 graffiti writers in Melbourne emphasise the enjoyment perpetrators derive from the activity, which is partially linked with its risk-taking nature and partially with its social nature, linking graffiti-ists with a group of others engaging in the same activity. As in music subcultures, the recognition that could be gained among groups of friends for creative ability, productivity or daring (in graffiti-ing inaccessible areas) was no small part of the motivation. One interviewee describes it thus:

> I was kicked out of home age 15, um, my friends were very important to me . . .Through this connection with graffiti *I found a new family on the street* . . . I found a new form of recognition . . . A new form, my ego was nourished and . . . Um my god it felt good to, ah you know, put up my tag and then friends to say, yeah I saw, yeah I saw your piece on the weekend, yeah and whatever . . . Sort of like it's, it was, it was *a communication amongst the family on the street* um so . . .(excerpted from a longer quote in Halsey and Young, 2006, p.280).

The authors compare this with the pleasure academic writers take in peer recognition as attested by citation indexes for academic articles; it could also be compared with posting on social networking sites such as YouTube – indeed there is now a strong overlap between the two worlds, with graffiti artists displaying their achievements on networking sites and reciprocally learning new techniques from graffitists in distant cities and nations from such sites (Light *et al.*, 2012). Some of the interviewees distinguished between 'tagging' (usually writing repetitive gang or individual names), which was viewed as requiring little or no skill and could be described as vandalism, and what in an earlier section are labelled 'hip hop' approaches, creating a whole field of colour and shape, which are seen as 'art'.

In terms of the sites chosen, places that are not used for any formal purpose, but which have high visibility, such as the walls beside train lines, were seen as highly desirable. One graffiti-ist considered that by creating 'pieces' in these kinds of spaces, he was turning a 'negative' (neglected) space to better use. Importantly, as the authors note, there is little urge to destruction or negation in the minds of the perpetrators. They want to 'put a piece of [me] into [my] area', 'try to make it look exciting instead of boring'.

However, the culture of this group of graffiti-writers had a darker side. Fighting was an integral and accepted part of graffiti culture, that emerged in particular when graffiti-ists from one 'crew' made marks on each other's graffiti 'pieces'. Fights between in some cases sizeable gangs were organised, the aim of which was to prove physical, as well as artistic, supremacy (Halsey and Young, 2006). Taylor *et al.*'s (2012) study confirms the link between involvement in graffiti writing and violent assault. The authors link this with the social capital found in graffiti 'crews' that is absent elsewhere in the perpetrator's lives. A problem with their study is that it is not transparent about how the records of 800 offenders from the Western Australia Police database were selected from the over 3,750 offenders, in that while selection was said to depend on whether the offender had a three year history on the record, even if they ceased offending after their first year of contact with police, it is not clear why some offenders kept in touch with police but others did not. However, the study provides some insight into a possible relationship between the tendency to write graffiti and to commit other crimes. Over the three year period explored by the study, offenders divided into three groups. Over a third offended only in the first year and did not offend thereafter: these were classed as 'initial' offenders. Around another third committed repeat offences in two of the three years examined, but not in all: these were classed as 'intermittent offenders'; while a third group of over a quarter were 'prolific recidivist offenders', committing offences in all three years for which records

were examined (ibid., p. 164). Here it should be noted that due to the nature of the selection process, there is likely to be a bias towards including this group in the final sample, so the proportion of recidivist offenders may be considerably lower than one third of graffiti-ists.

The study examined if committing a graffiti offence could be related to the likelihood of committing other crimes, and found this to be the case for those who fitted into the 'prolific recidivist offenders' category as well as those in the 'sporadic' category. Indeed for all three groups, graffiti crime was most prolific in the first year of offending but then tailed off. While in the first group, the 'initial offenders', there was no further offending, in the other two groups, their involvement in serious crimes, including burglary and assaults, increased. In spite of the limitations to this study's methods, we note these results, alongside those of Halsey and Young's 2006 qualitative study, as some foundation for resisting the overly-benign view of graffiti that some research can convey.

Nevertheless, Halsey and Young's (2006) study is largely backed up by a more recent contribution by Rowe and Hutton (2012), in emphasising the positive meanings that young people find in graffiti activities. The research included an online survey with around 770 self-selected respondents and 21 focus groups conducted through the Ministry of Youth Development in New Zealand (of the latter, 7 were focused on graffiti and tagging-perpetrators and the other 14 combined those who were not, and those who may have been involved in these activities). The survey found that nearly half engaged in graffiti for 'creative expression', while less than 2% in each case were motivated by a 'sense of danger' or a 'desire to damage something'. Again, the distinction between forms that were seen as art and those that were seen as vandalism arose, as well as the finding that there are informal rules about where these activities can take place, and strong disapproval of those who go against these rules:

> "There are rules, you know, even the graffiti guys have rules – so when someone breaks them it's the pits. You know, the OG [assumed to stand for Older Generation] writers don't tag churches or private property, schools. But people break those rules, most of the time it's just hooligans." (Rowe and Hutton, 2012, p.73).

Another study identified people's cars and fences as further no-go areas for graffiti (Halsey and Pederick, 2010). These findings are interesting in showing that contrary to the popular stereotype, graffiti writers do have respect, although selective, for both personal property and public places. This gives some support to the programmes that have sought to channel the urge to write graffiti into outlets that are both more generally acceptable to communities and safer for the participants.

5. Effective Measures for Changing Behaviour

5.1 Introduction

This section is about the costs, benefits and overall effectiveness of different approaches to tackling littering, graffiti writing and flyposting and bringing about behaviour change.

A number of studies have shown that the presence of litter engenders further littering – it is a self-perpetuating problem (Cialdani *et al.*, 1990; Krauss *et al.*, 1996). Some studies have succeeded in linking it with wider social disorder. For example, a Dutch study has found that litter in an environment resulted in doubling the number of those who engage in the opportunistic theft of letters protruding from letter boxes (Keizer *et al.*, 2008). This in itself suggests the urgency of taking measures to address the problem. Over the years, various measures have been introduced to reduce environmental incivilities, ranging from educational and awareness raising campaigns to legal action and penalties, each with varying degrees of effectiveness.

For example, Fix my street.com is a website set up by the government in 2007 to enable citizens to report, view or discuss local problems such as graffiti, fly tipping, unsafe paving or faulty street lighting and to monitor the local government response to them. A review of the effectiveness of the site that took place in its first year of running (King and Brown, 2007) suggested that it was not being well-used by all local authorities who had found some difficulty in reporting back on their actions in response to the reports. King and Brown identified an exemplary reporting website hosted by the London Borough of Brent, which had many good practice elements that could be usefully taken up by the national site. However, when the government site was checked for this review in 2012, it seemed that it was fairly underused and still had some of the problems identified by the authors in 2007. One anomaly is that while the users are asked to pinpoint their problem on a map, it seems this information is not passed on to the local council. Also anomalously, the government public information site (formerly Direct.gov, now simply gov.uk) gives a link to 'report a pothole' but this may simply lead to the web homepage of the local authority. We could identify no cross-link or reference on gov.uk to Fix My Street.com. Simply coordinating these two websites and investing in upgrading the former could be helpful for allowing people a simpler communication with their local council about issues of concern for Local Environmental Quality.

Where people's perceptions of Local Environmental Quality come into play, a body of evidence shows that these are correlated with the actual state of the environment (see subsections in section 3). However, it is also worth noting that the cultures of more and less deprived communities can also create something of a gap between people's perceptions of Local Environmental Quality and quality on the ground (KBT, 2010) – in other words, good quality environments could be accompanied by low satisfaction and vice versa. In 24 focus groups with the aim of getting to the bottom of this finding, KBT identified effects whereby people in more deprived communities have a more local focus and affiliation (the immediate neighbourhood), talk to each other more at local level ('as a result, perceptions can saturate an area') and seek results at this level and on a rapid time scale. By contrast, people in less deprived communities have a more interest-based affiliation, such as faith groups and 'friends of' groups, are prepared to talk to authorities more and are content with strategic and longer term responses. This suggests that different approaches to addressing the concern caused by a perception of low environmental quality need to be taken in different types of neighbourhood.

The efficacy of two main 'enforcement' approaches currently applied to address a range of Local Environmental Quality offences in the UK will be briefly discussed before moving on to look at issues for each specific LEQ issue.

Fixed Penalty Notices and Anti-social Behaviour Orders
The Fixed Penalty Notice (FPN) is a law enforcement tool first introduced to impose fines on people committing minor parking infringements. It was then extended to cover various other types of infraction such as public disorder, night noise, truancy and environmental crime. The latter covers various low level environmental infractions of relevance to this review including littering, graffiti, dog fouling and flyposting. The FPN can be issued on the spot, with minimal paperwork, by local authorities and their agents, police, parish councils and national park authorities. The government keeps records of all FPNs issued and fines paid. Local authorities have a degree of flexibility in how they use receipts from FPNs 'to encourage proactive management of local environments' (DEFRA, 2012). For example, in 2007-8 (the most recent figures accessible to this review) a total of 33,693 FPNs were issued for littering. Although around 2% of these remained unpaid, the revenue raised is recorded at £1,198,339.9 paid to local authorities. For dog fouling 2,079 notices were issued, raising £76,439; while 1,572 notices for fly-posting raised £112,482.38; both had similar or lower rates of default (HM Government, 2008).

Although FPNs are relatively low-cost to administer compared to Anti-social Behaviour Orders, the costs of employing patrol officers as well as the impact on offending behaviour would need to be investigated before it could be concluded whether they represent an effect way of managing Local Environmental Quality Issues and raising revenue for better environmental management. Given the

limitations of this review, it has not been possible to ascertain whether any such research has been completed or is ongoing.

The Anti-social Behaviour Order (ASBO) was introduced in 1998 under the last administration and enables the issuing of injunctions against behaviours that have a negative impact on those outside the offender's immediate household, including offences such as begging, shoplifting and vandalism. ASBO cases are judged by magistrates sitting in a civil capacity. Part 6 of the 2003 Anti-social Behaviour Act enables orders to be issued for environmental offences that include abandoned cars, littering, dog-fouling and fly-tipping. Orders can be issued by a range of authorities including British Transport Police, Local Government Authorities, Police, Registered Social Landlords and the Environment Agency. Although these cases are heard by civil courts, they require a high standard of proof and thus are considerably more costly than FPNs. Furthermore, they do not appear to be effective at preventing the behaviour targeted – in 2011, proven breaches were at a rate of 57% in England and Wales (HM Government, 2012). The issue here, apart from the implied inefficacy, is that breach of an ASBO (as opposed to the ASBO itself) is a criminal offence, tried in a criminal court, applying the standard for criminal trials, which is to prove breach 'beyond all reasonable doubt'. On this evidence, many more (often young) people are acquiring criminal records for offences that do not in themselves fall under criminal law, the undesirable consequences of which are underlined by Jamieson (2012).

Overall, these 'enforcement' approaches – the FPNs and ASBOS, in particular the latter – have been criticised for representing the 'criminalisation of social policy', of merging criminal justice with crime prevention (e.g. Darke, 2010; Jamieson, 2012). They have also been criticised on the basis of leaving the community out of solutions to the problems that arise within it, although both New Labour and Coalition governments have sought to incorporate a problem-solving community engagement element to the way ASBO cases are dealt with in the Magistrates Court (Donoghue, 2012). This appears to fit with criticisms of so-called 'Broken Windows' policing policy in the US, which in trying to address all the issues that create disorderly neighbourhoods through the central role of police coordinators, remove the possibility for lighter-touch, less incriminating community-focused responses (Mitchell, 2003).

5.2 Litter and behaviour change

Huffman *et al.* (1995) provide a review of research on strategies to address littering, dividing these into 'antecedent' and 'consequence' strategies; that is, those occurring before and after the littering had taken place. Both kinds of strategies were effective to different degrees and many subsequent analysts have concurred in arguing that littering is a responsibility that must be shared between producers, consumers and legislators. Based on, and slightly expanded from Huffman *et al.* (1995), the main policies for tackling littering are:

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- clearing up litter – given the self-perpetuating nature of littering, this can help prevent more littering in a location
- providing more, better-placed, effectively-designed kinds of waste receptacle
- on-site communication in the form of prompts encouraging people to use the bins
- communication through general public anti-littering campaigns at local authority or national level using one or several strands of the media
- differentiated strategies for different types of litter
- better packaging design and communication on packaging
- education strategies for use in schools
- fines, penalties and other kinds of sanction for those littering – consumers, producers or retailers
- rewards for those who do not litter such as a deposit system, which was tried successfully in New York (Levitt and Levanthal, 1986)

5.2.1 Food and drink packaging

A number of strategies for reducing food and drink package-related littering have been put forward and some have been tested. These are outlined below.

Packaging design: Wever *et al.* (2010) define four kinds of design strategy that can help to reduce littering:
- ecofeedback (communicating environmental consequences)
- scripting (designing so that the desired behaviour is easier)
- enforced functionality (designing so that the undesirable behaviour is impossible)
- functionality matching (matching the design to respond to the actual behaviour)

The first strategy might be represented by labelling on products, the second by designing packaging that is easy to reuse, the third by designing packaging where littered components like ring-pulls do not detach; and the fourth by, for example, increasing capacity of bins in popular disposal locations. The experimental study tested the effectiveness in particular of the first and second strategies under various conditions and found the results were not straightforward, with some hypotheses disconfirmed, indicating that there are no 'magic bullets' that can design appropriate disposal into packaging.

Retailer levy: With the Alcohol Scotland Act 2010, the Scottish Government paved the way for the introduction of a Social Responsibility Levy (SRL) to ensure that alcohol retailers and licensed premises whose activities can impact negatively on the wider economy contribute towards the cost of this impact. This means that alcohol outlets including pubs, bars and off-licenses, can be levied with a charge towards the costs arising from alcohol sales, including, for example policing and cleansing based on the 'polluter pays' principle. However the findings of Forsyth and Davidson's (2010) small scale study suggest that it may be hard to prove a strong association with particular retailers and litter, given that the distribution of alcohol-related litter appears to have a higher association with neighbourhood deprivation than with the site of purchase.

Negative feedback to producers: While litter surveys generally measure only the type of product that has been dropped, a baseline study of brands of litter (appended to the annual National Litter Index survey of 983 sites) was made by the main NGO acting on litter in Australia in 2008. This found that 24% of litter was identifiable by brand (Keep Australia Beautiful, 2008). Within this group, around 1,000 separate brands are identifiable. As an example, McDonalds branded packaging made up nearly 10% of all branded litter in the survey. There was even an upwards trend in that in the November 2007 survey, 999 McDonalds items were found representing nearly 60% of the litter in the 'Takeaway food and drink containers and packaging category' (ibid., p.8). By May 2008 the number of McDonalds items had increased to 1,472, representing nearly 68% in that category (ibid., p.80).

Part of the reason for this prevalence may be, as mentioned above, that younger and lower income groups tend to litter more than the older and higher income groups and it is these groups that tend to be the main consumer groups for McDonalds. While providing more disposal facilities and educating consumers is one strategy, identifying brand share of litter can help to raise awareness of a 'negative externality' of within the company responsible. They may find it to be in their interest to direct more efforts into tackling the issue, as research testing consumers' reactions in control and experimental conditions has begun to show negative impacts where litter clearly bears the corporate logo of brands (Roper and Parker, 2006 and in press). Developing this line of research and disseminating it to fast food companies could be a way to encourage them to reduce litter from their product at source.

Packaging covenant. Australia introduced a Packaging Covenant in 1999 whereby companies could voluntarily sign up to a commitment to reduce the environmental waste from their products' packaging. This was followed up in the 2005 with the introduction of a stronger covenant that set specific targets for recovering and recycling different types of material. The recycling of post-consumer packaging was aimed to improve from 48% at the 2003 baseline up to 65% by 2010; by 2007, it was already more than half-way to achieving this reduction (58%) (Laursen, 2007). The Covenant was coupled with legislation, the National Environment Protection Measures, that require all companies with a turnover of a $2 million or more and producing a large volume of packaging to recycle all their packaging waste (if they have not already signed up to the Packaging Covenant). Coupled with an award scheme for the packaging industry, this set of initiatives is said to have achieved good industry acceptability and compliance and industries have achieved financial as well as reputational benefits through streamlining their packaging (ibid., p.31).

The dedicated website for the initiative (http://www.packagingcovenant.org.au/) showed that by 2011, while there was a small (approximately 5%) increase in packaging consumption between 2003 and 2011, the Covenant had achieved an overall 63% improvement in recycling from the 2003 baseline; and packing waste disposed to landfill was down by almost 37% (APC, 2012). This echoed a continued downward trend in littering identified by the National Littering Index (Keep Australia Beautiful, 2012). This indicates that such non-coercive initiatives, accompanied by positive publicity opportunities such as public ceremonies giving awards to star achievers, may also have a role to play in policies to reduce litter at source.

5.2.2 Cigarette-related litter

A large range of policy interventions to prevent or abate cigarette-related litter that have been proposed in the US is reviewed by Novotny *et al.*, 2009. The interventions include labelling filters as non-biodegradable, deposit/ return programmes, waste fees, litigation against the tobacco industry to recover clean-up costs, fines levied against consumers or tobacco companies, mandated filter biodegradability, a ban on filters and consumer education. The authors note that only the latter has been tried with any consistency, apart from in San Francisco, which has attempted to impose a waste fee of $0.20 per packet of cigarettes sold in the city. The city also conducted a study of the annual cost of clearing tobacco waste, which in 2009 was estimated at over $6 million (Health Economics Consulting Group, 2009 cited in Marah and Novotny, 2011; see also Schneider *et al.*, 2011).

Consumer education. In terms of consumer education carried out by tobacco companies, tests with consumers found that anything that could be interpreted as critical or accusing in tone was not acceptable, and smokers preferred to be reminded by means of a 'a gentle nudge' (Smith and Novotny, 2011). 'Please bin your stubs' was found acceptable in Australia; 'a little thought, a lot less litter' in the US. Any slogan accompanied by the image of cigarette stubs was unacceptable and the idea that smokers might pick up stubs once discarded was also rejected. However, these findings should be considered in the light of their origin in tobacco industry studies.

Representing almost a polar opposite to this approach, Rath *et al.*'s (2012) study of smokers' attitudes suggests that one important new dimension of any education campaign should be the new evidence of the environmental harm caused by cigarettes (Slaughter *et al.*, 2011; Moerman and Potts, 2012). A joint message about the toxicity of cigarettes to human health and to the environment could be more powerful than each message conveyed separately. With regard to littering, an education campaign could emphasise that cigarette stubs are not just dumping hundreds of thousands of tons of non-biodegradable matter into the natural world each year, but are polluting it with toxins that are harmful or deadly to many living organisms.

Reducing smoking by tackling environmental disorder. Miles' (2006) finding in her study of seven European cities of an association between signs of disorder such as litter and graffiti and rates of smoking suggested that tackling litter and graffiti might form part of any smoking prevention campaign. Another interpretation might be that just as litter and graffiti can lead to an escalating cycle of disorder, so tackling these problems might create a virtuous circle that makes it easier for residents to adopt more healthy behaviours.

Lobbying the tobacco companies. A different position is taken by those who hold that cigarette-related litter is a problem that should be tackled by tobacco companies, and perhaps also, shops that sell tobacco products. Representative of such a position, Smith and McDaniel (2011) propose that there is a place for agencies responsible for tobacco control to unite with environmental agencies to lobby tobacco companies to tackle the problem of cigarette-related litter at source.

Waste charges. Schneider *et al.* (2011) propose a methodology for cities to levy a charge for cigarette waste disposal on the retail sales of cigarettes, as has been introduced through San Francisco's 'tobacco litter abatement fee'. Based on the costs that this litter represents to the city authorities, and to the environment, a 'tobacco litter abatement fee' of $0.20 per packet of

cigarettes was introduced by the state in 2009, and set to come into effect in the October of that year. This recognises the nature of tobacco product waste as a 'negative externality', that is a cost to third parties incurred by the operation of a market, for which the third parties are not compensated. While the negative externality of costs to the health system through smoking may be in some countries covered by a tobacco tax, the costs of cigarette generated litter are generally not included in the purpose of this tax. The costs San Francisco wants to collect through its 'Tobacco litter abatement' tax includes the collection of litter at or near the source using a combination of manual clean-up, mechanical street/sidewalk sweeping and power washing. It also includes mitigation at centralised sites where cigarette litter accumulates, including storm drain clean out, sewer clean out (e.g., cleaning debris screens and filters at sewage treatment plants) and other forms of manual clean up (Schneider *et al.*, 2011: 37).

Schneider's article however notes the obstacles that have been put in the way of bringing this law into effect including legal action from a tobacco company and a state-wide law ('Proposition 26') passed in 2010 that requires a two-thirds majority vote in the California State Legistlature 'to pass fees, levies, charges and tax revenue allocations that under the State's previous rules could be enacted by a simple majority vote' (Schneider *et al.*, 2011, p.39). If and when eventually implemented, it would be worth monitoring the impact of this law on altering the practices of smokers, retailers and producers over the longer term.

5.2.3 Drug-related litter

Papenburg *et al.*'s (2008) Montreal-based study of children sustaining injuries from discarded needles found that the majority – two thirds – had come into contact with the needles through intentional handling, while the remaining third had made contact accidentally. The authors point out that this represents a particularly strong argument for better education of children about the risks entailed, particularly as over a quarter of the injuries occurred in areas that should be expected to be safe for children: in and around the home, at a day nursery or at school. They also note a decline in injuries from 2003 onwards, coinciding with a programme of implementation of park clean up and needle retrieval in Montreal (ibid., 2008: 490).

In spite of the UK Guidelines on drug-related litter being introduced by DEFRA in 2005, a large 2008 survey found serious deficiencies in the local authorities' approach to dealing with discarded needles from illegal drug use (Blenkharn 2008). These included both long delays to responding to reports of

discarded needles (up to 7 days) and unsafe and inaccurate advice to those reporting finds and injuries. For example, while some authorities rightly emphasised that needles must not be touched, others recommended that they be taken home so the local authority could collect them at a later date. Those with injuries were in some cases correctly advised to seek immediate medical assistance but in others invited to "write in for our free needle stick leaflet". Similarly, there was only limited evidence in Blenkharn's survey that local authorities were following DEFRA guidelines to provide dedicated drug-waste litter bins in 'hotspot' areas (DEFRA, 2005). There is however, significant evidence from international studies for the efficacy of such bins (Riley *et al.*, 1998; de Montigney *et al.*, 2010). The barriers may lie in authorities' fear of provoking controversy among the public because providing the bins shows a degree of acceptance and accommodation towards illegal drug use, particularly where they are provided in buildings (the latter can also be an area of legal controversy – see Flemen, 2005).

5.2.4 Dog-fouling

Although dog waste is expensive to clean from the streets, most policy interventions are not evaluated for their effectiveness. A systematic review of interventions to prevent dog-fouling (Atenstaedt and Jones, 2011), which included six major electronic databases and 47 other databases and websites, found no good quality studies which have looked at interventions to prevent dog fouling. The authors recommend that such research is commissioned and propose suitable methods. They observe that,

> "Local authorities have made use of a variety of interventions to tackle dog fouling. These include placing notices in public areas, media coverage, enforcement, leaflet distribution, provision of free 'poop scoops' and siting of dog waste bins. It has been reported that the authorities on the Isle of Man have adopted more draconian measures, such as DNA testing of dogs and discarded faeces. Although some local authorities, for example Torbay, have attempted to evaluate the effectiveness of these interventions, the impression is that most have not been scientifically trialled." (Atenstaedt and Jones, 2011, p.91).

One 20 year experiment was conducted, and ultimately rejected, by the city of Paris under Mayor Jacques Chirac. The administration made a concerted effort to deal with the problem by introducing a fleet of dedicated motorbikes with integral cleaning equipment in 1982 (the Caninettes, familiarly called 'Motocrottes'). The scheme ran for 20 years and cost an estimated £3 million annually, but was said to pick up only 20% of dog faeces in the city. Other methods were also used so that the city was spending £6-8 million a year on the problem and each item of faeces was estimated to be

costing 30p to clear. The Motocrotte scheme was finally abandoned in 2002 in favour of stronger legislation and local enforcement, which when launched in 2002 levied €500 fines on the non-compliant (Henley, 2002).

In England, a high profile national campaign by Keep Britain Tidy over the last decade seems to be having some impact, as their most recent on-the-ground survey found that the percentage of sites affected by this kind of litter had declined from 10% in 2001/2 to 7% in 2010/11 in line with a long term trend of improvement (KBT, 2012a). The campaign involved various partnerships with voluntary and commercial organisations that could influence pet owners using a combination of influential slogans, education about hazards and practical measures to make cleaning up after pets easier, in order to get the message across. A partnership with a major chain of pet shops was one of the clear successes, increasing sales of pooper scoopers by 50%, dog bags by 13% and freeze sprays by 36% on the previous year (KBT, 2012a)

5.2.5 Flytipping

Evidence from the 'Flycapture' database mentioned earlier, which records all incidents of flytipping in the UK by local authority, can be analysed to assess the level of prosecution rates for this offence. One study, focused on the English county of Hampshire, noted that the prosecution rate was extremely low (Hodsman and Williams, 2011), suggesting that the current legislation may be ineffective. The availability of data in a central location suggests the potential for a national study that could establish whether there is a need to further amend the legislation.

5.3 Graffiti and Fly posting and behaviour change

Public Notices: A study in the field of social psychology has looked at the impact of public notices that forbid a particular behaviour when these are encountered in the context of evidence that the prohibition has been disregarded (Keizer *et al.*, 2011). The authors put their study in the context of a theory that distinguishes between three kinds of goals – actions for personal gain, for current gratification and to comply with norms of appropriate behaviour. People alternate between all three kinds of goals in everyday life, but of the three goals, the one that motivates people to comply with norms is the weakest and relies more than the others on external support: in other words: "people tend to copy the behaviour of others when it is ambiguous how one should act" (Keizer, *et al.*, 2011, p.682). More than this, as noted earlier, signs that one norm has been disregarded, for example, graffiti, might lead to the suspension of other norms, for example littering. The authors conduct

experiments to find out whether prohibition signs encountered in a context where they have been plainly disregarded can lead to the suspension of norms. Their results suggest that in particular the policy of putting prohibition signs in places where there is an existing problem may have the reverse effect than the one intended, because if the behaviour continues regardless of the prohibition, the weak goal of complying with social conformity in these matters is likely to be further weakened. The authors go so far as to conclude that:

> "…in a setting where many people do not follow the norm, it is wrong to believe that norm conformity can be increased by making this norm extra salient with a prohibition sign. What the sign does is to weaken the goal to follow norms by making the negative norm-support cues more salient….This effect did not just hold for the norm that corresponds to the prohibition sign. As hypothesized, we showed that if people don't show respect for the prohibition sign, they will also be likely to violate a completely different norm. This 'cross-norm' effect makes norm violations spread, and prohibition signs can be an important factor in reinforcing this spread." (Keizer, *et al.*, 2011, p. 687).

Zero tolerance, negotiated consent and discretionary permits. Rowe and Hutton (2012) conclude their report on a large-scale survey and focus group study of the phenomenon of graffiti with the advice that:

> "– the diversity of graffiti urgently needs to be addressed by policy makers. For policy makers this involves considering how to address the negative impacts on the community while retaining those aspects of graffiti that have positive impacts on the communities in which they appear." (Docuyanan, 2000; Halsey and Young, 2002).(Rowe and Hutton, 2012, p.83).

However, to achieve this successfully may present considerable challenges. A good example is given by Alison Young, a criminologist in Melbourne, who was invited to feed into the city's new graffiti policies and recounts her recommendations for a differentiated approach, and the city's reaction (Young, 2010). Melbourne has a relatively recent history of graffiti, dating back as a subject of discussion to the 1980s and rising in the 1990s and 2000s to the status of widely-acknowledged tourist attraction. Due to the convergence of the graffiti zones along rail tracks and the central business district, the city decided to formulate a graffiti policy in 2004. The creation of the strategy was inclusive and it set out to be equitable, noting that "the City of Melbourne includes ratepayers and non-ratepayers, residents and commuters, tourists and students, and those who like or dislike graffiti" (Young, 2010, p. 101). The draft strategy, which was shaped by Young based on the

consultations, emphasised working in partnership with all the stakeholders including police, property owners and perpetrators. It came up with a proposal for dividing the city into three areas: zones of no tolerance (zero graffiti permitted/retained), limited tolerance (where the decision about allowing/retaining the graffiti was in the hands of the property owner) and designated zones (graffiti permitted, not removed by council and allowed to self-regulate), to be selected through extensive consultation with the community and stakeholders. This would particularly apply to Melbourne's intricate system of alleys, the Laneways, already the site of some of the best graffiti and promoted as a cultural experience by the tourism bodies.

Although three quarters of public responses submitted on the strategy were in favour, it was nevertheless abandoned and replaced the following year by a Management Plan that eschewed consultation, and described itself as a policy of 'Zero Tolerance'. The plan later included a system of permits that the Council could give out to property owners for the commissioning or retention of 'street art' of the kind it claimed the community preferred, over which it reserved the right to adjudicate. In practice, the marking of approved sites with the notice 'City of Melbourne Permit', generated much confusion among graffiti artists, who understood this to apply to the whole wall, "with the result that existing sites of graffiti showcasing the most talented practitioners became deteriorated by too many interventions". Furthermore the attempt to protect a work valued by the city, a 'little diver' stencil by Banksy, by covering it with a sheet of plexiglass, incited concerted attempts to deface it by other graffiti artists – so that it has now been completely obscured. These outcomes could be seen to suggest some of the unintended consequences that occur when a city attempts to take benefit from the best of its graffiti artists' work without working with the wider graffiti community, including those whose efforts are 'selected out'.

Private property upkeep. In suburban residential areas, one study offers evidence to suggest that encouraging householders towards better maintenance of house fronts could go some way to mitigating the incidence of graffiti. Seeming to support the finding noted earlier about the 'contagion' that can occur between the breakdown of different types of norms, a large scale Australian study (covering 443 street areas) found a very strong association between visible signs of security measures on house fronts, unkempt front gardens and the incidence of graffiti (Foster *et al*, 2011). In the case of unkempt front gardens, this effect was independent of the plot values. In other words, it would occur in advantaged and disadvantaged neighbourhoods alike. This linked in with the overall findings of the study which:

"...confirmed the hypothesis that house attributes that promote natural surveillance and reflect residents' territorial functioning are associated with a reduced odds of physical incivilities in suburban streets. Importantly from a policy and practice perspective, the findings suggest that it is not simply the presence of one or two attributes that have the greatest influence, but the cumulative effect of multiple features." (Foster, *et al.*, 2011, p.83.)

Quoting Brown and Altman (1983) the authors hypothesize that the well-kept front garden is a kind of territorial display that implies people's attachment to their location, sense of ownership and even their likely vigilance of their property, thus deterring property offences. They further speculate that these well-maintained house fronts represent a strong display of territoriality that deter criminals, who infer that stronger defensive behaviours would be encountered if they engaged in illegal activities in these areas. More directly, since residents plainly spend more time in their front gardens, on-street vigilance is likely to be higher (Foster, *et al.*, 2011, p.85).

Flyposting: While both fly-posting and graffiti have been on the decline since ENCAMS began the annual State of England's Local Environment audits ten year ago, fly-posting is still a problem for some retail areas, suggesting the advisability of approaches targeted to these areas (KBT, 2012a, p.31). Furthermore, the majority (66%) of the posting consists of remnants and 10% consists of business advertising, which imply that both improved removal and measures to educate businesses about the difference between fly-posting and advertising are advisable (KBT, 2012a, pp.32-3). The suggestion that fly-posting is increasingly 'advertising-by-other-means' is backed up by the finding in conducting the literature search for this review, where the majority of articles addressing this issue (including one of only two academic articles) arose in the fields of marketing (Black and Nevill, 2009).

6. Key Messages

Based on the above review of the literature the following key messages can be identified with regards to the three categories of environmental incivilities: litter, graffiti and flyposting.

6.1 Littering
- New aspects of litter arise with changes in the law, business practices and social habits and customs – thus fast-food littering and cigarette stub littering are more prevalent now than three or four decades ago.

- Continued littering across many dimensions may be related to ignorance, particularly of more recent findings that establish wider environmental impacts of littering.

- It may also be harder for people to understand how small items of litter and those that are perceived as biodegradable can nevertheless cumulatively produce major environmental impacts.

- People tend to imitate each others' behaviour, so once bad practices have become instilled, they become more widespread and harder to eliminate.

- Likewise, a perception of disorder may be likely to engender behaviours which can potentially aggravate this as in the findings of the study about the association between signs of disorder such as litter and graffiti and rates of smoking.

- Rundown neighbourhoods also have an impact on people's mental health.

- Several aspects of littering and graffiti have an environmental justice dimension.

- While there is a continued role, and evidence of success, for public education on a range of littering issues; this is an ongoing, rather than one-off, exercise that needs regular refreshment and reiteration across a range of media.

- Local authorities can contribute to abatement by providing and maintaining public disposal facilities – from appropriately-sited bins, generic or specific to particular types of litter, to household waste recycling centres.

- Littering is not just the responsibility of the public; it is also of the companies producing, and the retailers selling, the packaged items that end up as litter.

- Pressure can be applied to producers to reduce the littering potential of their product with positive results, as in Australia.

- Specific legislation as in the case of the recent attempts at cigarette waste tax and alcohol litter levy in Scotland and San Francisco may be difficult to bring into effect.

- To some extent, littering can be reduced by design interventions in packaging. However, there is no magic bullet and findings are sometimes counterintuitive, so each intervention needs to be trialled.

- While many dimensions of littering are linked and mutually reinforcing, each kind of litter repays individual investigation in terms of why it arises, the attitudes of those perpetrating it and what methods have been used to allay it.

- Some areas of littering are under researched and efforts to combat them would benefit from more formal study.

6.2 Graffiti and fly-posting

- Graffiti is not a uni-dimensional phenomenon but relates to a variety of different cultures and practices, ranging from the street art to vandalism.

- At one extreme are manifestations embraced by local neighbourhoods and incorporated into local identity, and at the other are territorial markings by gangs that may also engage in violent and criminal behaviour.

- Fly-posting also has more and less offensive variants, but recent studies in England suggest it is mainly used as an informal kind of advertising

- The bias towards advertising in fly-posting suggests the appropriateness of targeting businesses with education about the difference between advertising and fly-posting, and the negative impacts of fly-posting which include costs to Local Authorities of clearing it and its contribution to the impression of disorderly neighbourhoods, as with graffiti.

- Graffiti is one of a number of 'environmental incivilities' that have been shown to increase both perceptions and the actual incidence of crime and disorder

- A proportion of those involved in creating graffiti are motivated by the excitement of breaking the law involved in its creation.

- Some may move on to more serious offences, including assault and burglary

- A lack of transparency in the sampling method of largest study identified mean that it is currently not possible to gain an accurate sense of the proportion who do so.

- Qualitative studies offer a more balanced picture of graffiti-ists by showing them as young people motivated by seeking an audience and recognition for creative expression and physical daring.

- The continuum of graffiti invites a differentiated response by authorities, that might even include selective permits

- However, the experience of the city of Melbourne shows the importance of sensitivity and care in the introduction of such policies if they are not to be self-defeating.

- In suburban areas effective interventions may include measures to mitigate other signs of neighbourhood disorder, for example encouraging private property owners to better upkeep of house fronts.

- Simple prohibition notices in 'hotspots' for both fly-posting and graffiti may have the opposite impact to that intended.

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