Waste Management and Sites of Historic/Architectural Significance

A Conservation Perspective

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Introduction: Waste Matters

A former co-ordinator of the Durham World Heritage Site summed it up well, "Waste management is only an issue to conservationists when something goes wrong."[1] It may—and indeed does—serve interpretive and community needs well to camouflage rubbish itself at historic sites like Iona Abbey in artful stone bunkers (Illustration 1, below left). In contrast, the role of waste management at sites of historic and architectural significance needs to be laid open and picked apart, although perhaps not as the gulls of Edinburgh's Georgian New Town do to plastic bin bags in on a nightly basis (Illustration 2, below right).

For the purposes of this dissertation, "waste management" comprises approaches to three different components: *commercial and residential waste*,

[1] Seif Al Rashidi, phone conversation with author, July 20, 2014.

including the solid by-products of bricks-and-mortar conservation projects; *systems for dealing with refuse in public places*, such as litter bins in streets; and *litter*, the rubbish that site users casually discard without resort to, or in favour of, designated receptacles.[2] Practically every site of architectural or historic significance manages waste, and some do it better than others. Most do it as a matter of course in a manner of fact way, without giving much strategic consideration to the challenges—let alone the opportunities—rubbish presents.

This dissertation argues that waste management needs to be given more than a peripheral role in our approach to conserving significant sites: buildings, conservation areas, and built environments. Incorporated into a holistic approach to site management, the ways waste is addressed can beneficially affect physical condition of the site, behind-the-scenes operations of the site, and user experience and appreciation of the site.

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[2] Other components, beyond the scope of this dissertation, might include non-solid waste, agricultural or industrial waste, and waste created by extractive activities like mining or drilling. While these components might affect selected sites of historical or architectural interest, they are normally addressed through specific policy and legislative regulation and their treatment is often beyond the control of site managers.

When Benjamin Franklin—originator of all good things American — organised the first publicly funded garbage collection in 1757, he could see the merits of clean streets, but he could never have foreseen the modern landfill or a Pacific island of plastic bottles.[3] A giant industry has arisen in response to what has become a global problem: dealing with the waste created by the tremendous increase in consumption of manufactured products during the post-World War II era. In the United Kingdom alone, more than 25 million tonnes of waste is produced each year; this represents a five-fold increase from the 1960s.[4]

The impacts of the waste crisis are well known and well documented. Cities struggle to find more landfill. First-world nations issue zero-waste policies with ambitious and time-limited goals. Developing nations are

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[3] John Roberts, "Garbage: The Black Sheep of the Family," Oklahoma Department of Environmental Quality, accessed July 15, 2014, http://www.deq.state.ok.us/lpdnew/wastehistory/wastehistory.htm.

[4] Data from the Highway Agency cited in "The Ins and Outs of Litter and Fly tipping" Litteraction, accessed May 15, 2014, http://www.litteraction.org.uk/images/new%20stuff/D1%20ins%20and%20outs,%20legal%20stuff.pdf. Also found in Allan Lewis, Polly Turton, and Thomas Sweetman, Litterbugs: How to Deal with the Problem of Littering (Policy Exchange: London, 2009), 7.

pressed to design and implement systems to handle the commercial and residential waste that is inevitably generated when growing economies drive increased consumption of manufactured goods. An increasing body of research addresses the economic, environmental, social, and even philosophical aspects of rubbish.[5] The costs of urban litter can be calculated using any number of measures: increased crime; decreased property values; street cleansing expenses; accidents; fire damage; pest control; flooding. Appreciation of the significance of waste management is heightening for all types of sites, with established recognition that different settings demand different approaches—waste in a natural environment is already recognised

[5] A cross-section of this research was consulted in the preparation of this dissertation including: Melissa Bateson et al., "Do Images of 'Watching Eyes' Induce Behaviour That is More Pro-Social or More Normative? A Field Experiment on Littering," PLOSOne 8, no. 12 (December 2013): 1, accessed June 15, 2014, http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0082055; John D. Cone and Stephen C. Hayes, Environmental Problems/Behavioral Solutions (Cambridge: Cambridge University Press, 1984); Heather Chappells and Elizabeth Shove, "Bins and the History of Waste Relations" (paper included in reader for Consumption, Everyday Life and Sustainability Summer School, Lancaster University, 1999); Joanneke Kruijsen, Gaming for Sustainable Behaviour Change (Aberdeen: Centre for Understanding Sustainable Practice, 2013); and Michael Thompson, Rubbish Theory: The Creation and Destruction of Value (Oxford: Oxford University Press, 1979).

and treated differently from waste in a typical urban commercial district or suburban residential neighbourhood.

Researchers continue to document and assess the toll poor waste management has on the natural environment, and nature conservationists are developing methods for prevention and amelioration.[6] Indeed, where the field of architectural conservation/historic preservation intersects with the scientific study of waste management, environmental impacts are generally the main focus. For example, the Heart of Neolithic Orkney World Heritage Site included considerations of user and operational refuse in the development of its 2008-2013 site management plan.[7] However common in

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[6] David Rodríguez-Rodríguez, "Littering in Protected Areas: A Conservation and Management Challenge—a Case Study from the Autonomous Region of Madrid, Spain," Journal of Sustainable Tourism 20, no. 7 (September 2012): 1011-24; Maria Anna Borges et al., Sustainable Tourism and Natural World Heritage (Gland, Switzerland: International Union for Conservation of Nature, 2011); Terry Brown, Sam Ham, and Michael Hughes, "Picking up Litter: An Application of Theory-Based Communication to Influence Tourist Behaviour in Protected Areas," Sustainable Tourism 18, no. 7 (September 2010): 879-900 provide good insights into the causes of and solutions for waste-related environmental degradation in protected natural areas.

[7] Historic Scotland, Heart of Neolithic Orkney World Heritage Site Management Plan 2008-2013—Consultative Draft, Appendix E: Environmental Report (Edinburgh: Historic Scotland, 2007). A new site management plan, covering the years 2014-2019, was released as this dissertation was nearing completion; this plan makes no mention of waste management.

the treatment of protected natural environments, strategic, consistent, and holistic approaches to waste management are the exception in the treatment of protected built environments.

Like protected natural environments, sites of historic and architectural significance need to be managed with an eye towards sustainable tourism and minimising user impacts. In addition, managers of historic and architectural places have a special responsibility to ensure that their own operations—whether administrative or in physical conservation projects—minimally impact the site. This goes beyond promoting "green tourism" at historic sites, which often places more emphasis on the visitor's actions than on management practices and frames the conversation about waste as "environmental", concerned with simple litter control or increased recycling.[8]

Efficient and greener waste management practices should be given a central, pro-active role in the manager's portfolio. The frame of the

[8] For example, the series of educators' guides to various properties operated by Historic Scotland includes wording that places the onus on visitors rather than on site operators, "As part of our commitment to Green Tourism, we ask that all litter be disposed of back at school." An example can be found in Historic Scotland, Investigating Blackness Castle: Information for Teachers (Edinburgh: Historic Scotland, no date), 14.

conversation needs to expand beyond waste's impact on the natural environment to include impacts on the built environment, and on users' perceptions of a site. Indeed, waste management more broadly conceived and thoughtfully implemented offers sites of historic and architectural interest important ways to engage users—that is to say tourists or visitors, residents, employees, contractors, commercial interests within the site—not only in understanding and appreciating a site, but also in conserving it for future generations.

A recent study of littering in Britain posits that, "Littering is symptomatic of social and individual attitudes toward public space…"[9] For sites of historic/architectural significance—literally our "commons", places celebrated as the most special, important, and fragile in our public realm—the question of how people's perceptions affect their behaviour regarding waste, not just limited to litter, is critical. When asked a series of questions about the cleanliness—defined as absence of litter and ease in disposing of waste and recyclables--of the Old and New Towns of Edinburgh World

[9] Allan Lewis, Polly Turton, and Thomas Sweetman, 12.

Heritage Site, eighty percent of respondents said that cleanliness affected their appreciation of a significant site "to some extent" or "to a great extent".[10] Responses did not significantly differ between visitors and residents or business owners of the World Heritage Site.

This dissertation is structured in three broad sections. To begin is a survey of ways in which waste management is a conservation issue or concern—philosophically; in terms of physical impacts on sites; whether site itself has implications for waste management practices; design issues; and how policy, regulation or politics are involved. The second section presents two case studies: the Colorado Chautauqua, where waste management has been thoroughly and successfully integrated into the Colorado Chautauqua

[10] To meet the five research objectives of this dissertation (understanding how a range of sites approach waste management; assessing the degree to which waste management is incorporated into overall site management; analysing decision-making in specific site; surveying whether user valuation of a site is affected by waste management practices; and identifying best or promising practices) research methodologies included a literature review referred to earlier and drawn upon throughout the text, case studies of two sites, observation, structured interviews with site managers, and a mixture of brief, oral surveys and focus groups with site users. Street surveys were conducted at various locations within the Old and New Towns of Edinburgh World Heritage Site. Respondents were asked a series of five questions; three questions asked for ranking on a Likert scale, one question was open-ended, and one question required a yes/no response. No remuneration was given for participation, although respondents were given a nifty "I Talked Rubbish" sticker in appreciation of their time.

Association's programme of historic preservation and site interpretation, and the Old and New Towns of Edinburgh World Heritage Site, where waste management has long posed a threat to the physical state of the site and to user appreciation and engagement with the site. The dissertation concludes with a brief series of recommendations and observations for managers of sites of historic/architectural significance seeking to incorporate waste management practices, technologies, and systems that enhance the physical well-being of the site and engage users in greater understanding and involvement.

Conservation Concerns

Conservation Ethos

A fine dissection of the fundamental aims and philosophical underpinnings of architectural conservation/historic preservation is beyond the scope of this dissertation. Nonetheless, it is important to establish that arguing for greater consideration of waste management practices, inclusion of waste management in conservation planning, and improving waste management practices across sites of historic/architectural conservation is compatible with the contemporary conservation ethos.

Current thinking about conservation of the built environment adds a dimension to traditional schools of thought, which emphasised "heritage" as a way of transmitting enduring cultural values from generation to generation. Strains of the heritage mentalité are still present and still valid, although we tend to think more in terms of translating or interpreting the values of one generation (or culture) to another. Limiting the impacts—indeed limiting the production—of waste is compatible with traditional

schools of conservation thought as both emphasise the enduring over the disposable, both privilege that which is controlled and civic over that which is anti-social and unplanned.

More recent conservation ideology borrows from environmentalism to stress sustainability, again a concept that is inherently opposed to waste profligacy. Increasingly, "green" arguments for conservation tend to have broader appeal to Baby Boomers and younger generations than do campaigns based on historicity, cultural values (which can be seen as exclusionary or elitist) or even aesthetics. These generations have been inculcated pro-environmental messages since childhood, such as United States Forest Services' effective and enduring campaign featuring Woodsy the Owl, who urged children to "Give A Hoot, Don't Pollute."

Architectural conservation can often best be promoted to property owners by evidence that it saves energy and protects the natural environment. For example, the government of one Canadian province argues for conservation as a pro-environment act by advertising that "aluminium window frames require more than one hundred times more energy to

produce" than retaining or rehabilitating tradition wooden windows. The same web site stresses that twenty percent of all landfill deposits in Canada is construction waste.[11] Architectural conservation can be positioned as "super green"; the Yorkshire town of Harrogate points out in its heritage guidelines that "the creative adaptation of heritage assets can dramatically reduce the whole-life energy costs and waste impacts that would result from demolition and replacement" and that even LEED-certified new construction has higher economic costs and environmental impacts than does retaining older structures.[12]

The Heritage Lottery Fund (HLF) also makes the case for good waste management in line with the modern conservation ethos stressing both environmental benefit and economic savings. Its *Reducing Environmental Impacts: Good Practice Guide* points out that 26 millions tonnes of construction waste is sent to United Kingdom landfills annually, representing

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[11] "Heritage," British Columbia: Business, accessed July 20, 2014, http://www2.gov.bc.ca/gov/topic.page?id=57D783A8BE44437C8A4F44FFE69EAF42.

[12] Harrogate Borough Council, Heritage Management Guidance: Draft Supplementary Planning Document Adopted for Development Control Purposes (Harrogate: Harrogate Borough Council, 2014), 105.

one-third of all waste deposited in landfills. The *Guide* then appeals to cost-savings by suggesting that good waste management can three percent of build expenses. HLF adds one more plank to its argument in favour of strategic waste practices, citing a "strong correlation between effective waste and materials management and low accident rates."[13] Cost-savings may be a very persuasive factor in encouraging sites of historic/architectural significance to adopt better waste management practices; litter, in particular, is more expensive to pick up than to prevent.[14]

The international conservation community evidences increasing interest in incorporating waste management as part of good conservation practice, again with an environmentalist emphasis. The toolkit for monitoring World Heritage Sites includes as an indicator a "Green Agenda" calling for World Heritage Sites to have an environmental policy that strives to reduce energy use and water consumption, maintain appropriate

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[13] Heritage Lottery Fund, Reducing Environmental Impacts: Good-Practice Guide (London: Heritage Lottery Fund, 2012), 11.

[14] John D. Cone and Stephen C. Hayes, Environmental Problems/Behavioral Solutions (Cambridge: Cambridge University Press, 1984), 55.

sewerage, promote waste reduction and recycling and provide environmental guidelines for new building and visitor facilities.[15]

Promisingly, some approaches go beyond the environmentalist case for conservationist approaches waste management by addressing more intangible but also more explicitly heritage-themed elements. Vigan, a colonial city in the Ilocos Sur province of the Philippines inscribed as a World Heritage Site in 1999, considers effective waste management as essential to protecting the site's Outstanding Universal Value by minimising the impact of tourism on the historic city.[16] The International Council on Monuments and Sites (ICOMOS) views waste management as one are of technical training and education that should be targeted in building planning and engineering capacity for the cultural heritage field.[17]

Enhancement of Cultural Heritage through Environmental Planning and

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[15] URBACT, Tool Kit for World Heritage Monitoring Indicators (Brussels: URBACT/European Union, 2006), accessed July 21, 2014, urbact.eu/.../Tool_kit_for_World_Heritage_Site_monitoring_indicators.pdf.

[16] "Vigan Submission," Best practice in World Heritage Site management, October 25, 2012, accessed March 25, 2014, http://whc.unesco.org/en/news/948/.

[17] ICOMOS International Training Committee, Principles for Capacity Building through Education and Training in Safeguarding and Integrated Conservation of Cultural Heritage (Paris: ICOMOS, 2013).

Management (CHERPLAN), a project of the Southeast Europe Transnational Cooperation Programme, explicitly seeks to promote better waste management practices at sites of historic/architectural interest by linking "heritage conservation and modern infrastructure."[18]

Thinking and practice that link waste management with architectural conservation are clearly on the rise internationally. However, Britain seems to be lagging in practical efforts to integrate waste management with conservation at heritage sites.[19] Almost without exception, the linkage, where it occurs, is concerned with waste generated through conservation construction projects. (Interestingly, this is not for lack of a theoretical framework, or even for legislative imperatives as will be examined in a later section.) Scottish Historic Environment Policy, for example is to "avoid waste caused by unnecessary demolition and replacement."[20] The Heritage Lottery

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[18] "CHERPLAN," CHERPLAN, accessed June 3, 2014, http://www.cherplan.eu/the-project.

[19] Alex Wilkinson, interviewed by author, Edinburgh, Scotland, July 24, 2014.

[20] Historic Scotland, Scottish Historic Environment Policy (Edinburgh: Historic Scotland, 2011), 14.

Fund, too, targets waste associated with construction, requiring waste management plans for funded projects with budgets over £300,000.[21]

It is promising, though, that conservation in Britain—and internationally—seems increasingly to focus on contexts broader than simply bricks and mortar, building-centric projects to concern with "sense of place". For example, since 1998, the Heritage Lottery Fund's Townscape Heritage Initiative has made grants to conservation areas seeking to enhance public realm, funding items like street furniture, outdoor lighting and new rubbish bins.[22] In the United States the National Trust for Historic Preservation, through its Main Street programme supports similar efforts to integrate conservation and public realm improvement.

This tacit recognition that waste management—in the form of litter prevention—is a piece with conservation thinking is explicitly conveyed in a 2004 monitoring report on the Robben Island World Heritage Site that

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[21] Heritage Lottery Fund, Planning greener heritage projects (London: Heritage Lottery Fund), 18.

[22] Townscape Heritage Research Unit, Department of Planning, Oxford Brookes University, Townscape Heritage Initiative Schemes Evaluation: Ten Year Review Report (London: Heritage Lottery Fund, 2013).

argues that poor waste management in the site negatively affected sense of place. The same report recommends that the Robben Island Conservation Management Plan should include "targets and actions of an Integrated Waste Management Plan." [23] The Robben Island report, obscure as it may be, contains two very important contributions to the conservation ethos. First, that unmanaged waste diminishes the sense of place. Second, that strategic and explicit systems for managing waste should be included in holistic approaches to conservation of significant sites.

Physical Aspects

It's telling that very little research has been conducted or published about the effects of poor waste management on the physical condition of significant sites.[24] More needs to be known, for example, about the chemical interactions between cigarette butt litter and stone surfaces (Illustration 3).

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[23] Report On the IUCN-ICOMOC-ICCROM Monitoring Mission to the Robben Island World Heritage Site South Africa (Paris: UNESCO, 2004), accessed July 30, 2014, http://whc.unesco.org/archive/2004/mis-916-0204.pdf, 14.

[24] My interest was piqued by the title of one study, but it turned out literally to be a count of various types of solid waste within a delineated area conducted as a training exercise in

Cigarette butts are the most common element in litter, and one of the most the most problematic because they decompose over a ten-year period.[25]

Litter and poor waste storage can also render a site vulnerable to catastrophe. Rubbish-clogged drainage systems, whether urban rain runoff drains or the swales of a country house path or agricultural yards, can lead to or exacerbate flooding and consequent water damage. English Heritage includes poor waste management as a risk factor in fires. It includes the

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geonometrics. Craig Byron, et al. "Quantitative Analysis of Litter Composition in a Historic Macon Neighborhood Experiencing Revitalization," Georgia Journal of Science 66, no. 2 (2008): 1, accessed May 17, 2014, http://www.gaacademy.org/GAJSci66-2.pdf.

[25] Allan Lewis, Polly Turton, and Thomas Sweetman, 14.

following indicators in one Fire Risk Assessment: Rubbish is "collected frequently; removed from workplaces; kept away from sources of ignition."[26] Waste stored inappropriately in attics and basements also posed a fire risk; perhaps one reason the 2002 fire in Edinburgh's Cowgate quickly spread from one listed building to another was the availability of rubbish and waste for fuel.

Ill-chosen street containers for rubbish in historic areas pose a fire threat; an unextinguished cigarette can easily set them alight. Illustration 4 depicts a plastic litterbin melted to the pavement in the Old and New Towns of Edinburgh World Heritage Site. The illustration also demonstrates another

stressor on the historic fabric—chewing gum.

[26] Steve Emery, Fire Safety in Historic Town Centres (London: English Heritage, no date), 25.

Chewing gum is commonly found on the pavements of historic urban areas in Britain. It's very difficult to remove, although some cleansing departments, such as Edinburgh's, do use gentle bioactive solvents.[27] Cardiff, in Wales, implemented a clever campaign to combat the unsightliness and expense of gum damage to pavements, installing eye-catching "gum drops" on lampposts in the city centre (Illustration 5).

[27] Paul Hutton, interviewed by author, Edinburgh, Scotland, July 26, 2014.

The receptacles themselves were made of recycled chewing gum, so doubly appealing to environmentalist concerns, and also manufactured by a social enterprise. Sponsored by the Wrigley Company as part of its corporate responsibility efforts, the gum drop programme is considered a success.[28] However, hot pink receptacles would likely be deemed incompatible design in conservation areas and other sites of historic or architectural significance.

More utilitarian designs for waste solutions might be appropriate in a heritage site. Prague, whose historic city centre was inscribed as a World Heritage Site in 1992, has greatly limited the physical damage caused by dog-fouling by posting distribution points for paper bags throughout the district (Illustration 6).

[28] Cardiff Council, "Litter Bin Policy" (report of the Environment Director, Cardiff, April 10, 2014), 3.

Caution needs to be taken when addressing waste, however, so that the solution does not itself create negative physical impacts. In Santiago de Compostela World Heritage Site in northern Spain, for example, small metal litterbins that are compatible with the character of the medieval streets surrounding the famous pilgrimage cathedral are corroding and leaving rust stains on buildings (Illustration 7).

As will be discussed in the second section of this dissertation, the Old and New Towns of Edinburgh World Heritage Site has been struggling with waste management for decades. Residents of the Georgian New Town—supported by well-intentioned conservation groups like the Cockburn Association—resisted the implementation of communal rubbish bins, citing incompatibility with the historic character of the area. The traditional method, residents' leaving black plastic bin bags out for weekly or bi-weekly collection, resulted in chronically littered pavements as foxes, seagulls and other vermin ripped open bags.

One solution, endorsed by Edinburgh World Heritage, was adopted on select streets in the New Town in 2011: UV-resistant, woven polypropylene bags into which plastic bin bags are inserted prior to collection. Residents hang these bags on the cast and wrought iron railings at the front of their properties (Illustration 8).

There's an interesting debate to be had about whether these gull proof bags are any more compatible with the character of New Town streetscapes than are communal bins.[29] What seems to be over-looked by residents and conservationists advocating for the Velcro-closing bags is that the way they

[29] Indeed, this debate has been a lively one since the bags were adopted. See, for example, Phyllis Stephen, "Gull Proof Sacks--a Waste of Time?", Edinburgh Reporter, May 1, 2014, accessed June 23,2014, http://www.theedinburghreporter.co.uk/2014/05/gull-proof-sacks-a-waste-of-time/.

are used actually leads to the degradation of the historic fabric of the World Heritage Site. The bags are often used improperly; they are not closed up entirely or are opened by passers-by seeking to dispose of their own wrappers and bottles, so vermin can still scatter rubbish on the pavement (Illustration 9).

Besides being unsightly, this rubbish clogs storm drains, which can lead to flooding of lower-level floors in the area's Georgian tenements and townhouses. Less noticeable, but perhaps more troubling from the perspective of physical conservation, is the practice of hanging the full bags on iron railings, often in multiples reflecting multi-unit houses (Illustration 10, left, single bag; Illustration 11, right, multiple bags).

Most townhouses and tenements within the New Town are at least B-listed properties; many are A-listed. In almost every case, the railing is mentioned in the listing and railings are considered a character-defining feature of the New Town Conservation Area (whose boundaries also are contained within the World Heritage Site). The outward tension on the railing caused by hanging the heavy gull proof bags and the upward tension on the cast-iron decorative finial caused by repeated pulling of the bag by refuse collection workers will over time lead to damage to or loss of railing components and loosening the lead solder that seats each upright in its stone plinth.

Site Form and Character

Waste management in sites of historic/architectural significance must be planned and implemented to complement the inherent nature of the site,

as well as address challenges posed by its form or character. This is true for rural or isolated sites, areas or single structures. Good conservation practice realises that there is no "one size fits all" solution, even if political pressures—as discussed in a latter section—demand equal treatment of protected and non-protected areas. The best waste solutions for a site of historic/architectural significance are often not the easiest or most cost-efficient, but they are always the ones that preserve and enhance its form and character.

At the most basic level, the archaeological resources of a site can come into play when planning waste systems. In Linlithgow, Scotland, retrofitting in-ground collection points for recycling in a conservation area necessitated prior excavation to ensure no artefacts would be damaged by the project.[30] At archaeological sites, like Mesa Verde in the state of Colorado, waste itself in the form of midden heaps can be used interpretively to inform visitors about site significance.

[30] Karen King, phone conversation with author, July 24, 2014.

Rural or remote sites can present limited options for waste management planning and implementation. Indeed, the Japanese government had real concerns about nominating Mount Fuji as a World Heritage Site out of concern that World Heritage status would require an unserviceable level of waste management.[31] One former manager of such a site remarked, "At rural sites, you usually end up chucking it [visitor and operation waste] in a bin at home because there's no pick up at the site."[32] Rurality or remoteness is clearly a challenge for small organisations; disposal of refuse by staff at their homes may indeed be the best solution, certainly preferable to the fire and vermin risk of stockpiling waste on-site for commercial bulk pick up.

Larger organisations, especially those with public charters have more options despite their rural, remote or disparate nature. The Canal and River Trust, a network of more than 2,000 miles of natural and built waterways in

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[31] "Managing Mount Fuji's Fame," Japan Times, May 22, 2013, accessed June 12, 2014, http://www.japantimes.co.jp/opinion/2013/05/22/editorials/managing-mount-fujis-fame/#.U8zwx41dUm8.

[32] Beth Thomas, phone conversation with the author, July 17, 2014.

England and Wales, disposes of 6,000 tonnes—57,000 bins full—of waste annually. The Trust spends more than £1,000,000 each year to ensure the network is clear of rubbish and contracts with Biffa, one of Britain's largest commercial waste management companies, to execute its waste management plan.[33]

Stonehenge, a rural but not-so-remote site, historically struggled with waste management. Attracting more than a million visitors annually, the site was left with expensive clean up bills each year in the wake of all-night solstice celebrations.[34] Seeking to improve the visitor experience, offer a fuller interpretive program and protect the site, a new visitor centre was opened in January 2014. Both the construction process and the operational plan incorporated site-specific waste management strategies. Environmental mitigation measures were specified in contractors' agreements as project managers strove to follow guidelines and policies from English Heritage as

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[33] "Waste Management," Canal & River Trust, accessed March 25, 2014, http://canalrivertrust.org.uk/our-work/waste-management.

[34] "Business Management of Stonehenge," English Heritage, accessed May 17, 2014, http://www.english-heritage.org.uk/content/imported-docs/education/business-management-stonehenge.pdf, unpaged.

well as the local authority. The bidding process for on-going waste removal services involved evaluating the competitors' environmental record and ability to understand the site. [35] Increased recycling has been provided for in the new visitor centre; the emphasis in waste management strategy is now to present the Stonehenge monument itself and the visitor centre at as high a standard as possible. [36]

Island sites require careful planning and implementation to successfully prevent waste from having adverse affects on the fabric of the site and the visitor experience (and of course, on the natural environment as well). The St. Kilda World Heritage Site, forty miles from the nearest land and that an island itself (North Uist, Scotland) draws on the longstanding presence of military personnel and delegates waste disposal activities to the

[35] "English Heritage Appoints Waste Contractor for Stonehenge Visitor Centre," Recycling and Waste World (January 7, 2014): 1, accessed May 17, 2014, http://www.recyclingwasteworld.co.uk/news/english-heritage-appoints-waste-contractor-stonehenge-visitor-centre.

[36] Cerian Trevan, phone conversation with author, July 27, 2014. Interestingly, the new Stonehenge centre including sustainable liquid waste systems; the site now uses its own natural source of water and has on on-site sewage treatment facility.

Ministry of Defence.[37] Iona Abbey, maintained by the National Trust for Scotland, is served by the Argyll and Bute Council's regular refuse trucks. However the trucks come by ferry from Mull only every two weeks, with glass recycling pick up on a monthly basis. The National Trust recently opened a new visitor centre on Iona and used that opportunity to construct rubbish depots that are designed to suit the site's rocky landscape and artfully screen the waste that accumulates between pickups (see Illustration 1). In addition, to avoid cluttering the site with signage, the depot also displays way-finding information for visitors. The Robben Island World Heritage Site in South Africa experiences challenges similar to Iona's—offshore location, increasing visitorship, dependence on public utilities for waste removal--and yet appears to have struggled to address these challenges. More than a decade ago, a joint monitoring mission to the site noted significant deposits of rubbish, some remaining from the apartheid-era use of the island as a penal colony, some flotsam washed up on its

[37] The National Trust for Scotland, St. Kilda World Heritage Site Management Plan, 2012-2017 (Edinburgh: The National Trust for Scotland, 2012), 17.

shores, much generated by the current residents of the island, and litter discarded by day visitors because bins were few and far between.[38] Sadly, it appears that recommendations for the creation of a comprehensive waste management plan have not been adopted; if such a plan has been developed, implementation has been lax and Robben Island's open spaces and many public areas are marred by litter and rubbish.[39]

Urban sites of historic/architectural significance—in the sense of area conservation—present perhaps the most challenging, because most complex, arena for waste management in a conservation context. The 2002 Budapest Declaration on World Heritage recognised the unique demands involved in conserving historic urban spaces and urged "an equitable balance between conservation, sustainability and development."[40]

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[38] Report On the IUCN-ICOMOC-ICCROM Monitoring Mission to the Robben Island World Heritage Site South Africa.

[39] Site visit by author, March 9, 2014.

[40] UNESCO World Heritage Convention, World Heritage Committee, Budapest Declaration on World Heritage, accessed July 21, 2014, http://whc.unesco.org/en/decisions/1217/.

Edinburgh demonstrates the challenges involved in achieving that balance. Many of the city's neighbourhoods are protected as conservation areas; its entire city centre is a World Heritage Site. The physical layout of the World Heritage Site makes waste management an ever-present concern for the local authority, for conservationists and for residents. Central Edinburgh's dense plan—both of medieval Old Town and the Georgian New Town—makes it difficult both to store residential waste and recyclables as well as to collect them. Narrow closes and streets in the Old Town offer few places to locate larger bins without blocking access and rubbish often needs to be carried out by workers to trucks in larger streets. Development of former mews into desirable residential units in the New Town has taken formerly utilitarian spaces out of use for waste storage and collection.[41] Storage and collection of trade waste is particularly problematic, since most commercial areas lack alleys or other storage spaces. Trade waste then

[41] "Recycling Will Be Made Easier for Edinburgh's Flats and Tenements as Part of a New Pilot Recommended for the City," City of Edinburgh Council, March 13, 2014, accessed May 17, 2014, http://www.edinburgh.gov.uk/news/article/1483/simpler_recycling_service_set_for_city_tenements.

becomes a significant component of Edinburgh's litter problem.[42] Even Edinburgh's historic street surfaces pose a challenge to waste management: stone setts trap small bits of litter, especially cigarette butts.[43]

Linlithgow and Durham, England experience challenges based on urban form that are similar to Edinburgh's. Vehicle access is often difficult in Linlithgow's conservation areas because streets are narrow; rubbish needs to be hand-carried to trucks in especially tight closes and streets. The absence of gardens and alleys makes storage of rubbish problematic.[44] The Durham World Heritage Site also has a dense medieval urban form, and truck access has been the topic of negotiations between the three entities within the site: Durham Cathedral, Durham University and the Durham County Council.

As complex as urban sites of significance can be, few are subject to close and detailed study of their waste management practices and needs in a way that can result in a comprehensive approach that integrates

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[42] 'Survey warns city centre losing litter battle," Edinburgh Evening News, August 5, 2014, accessed August 7, http://www.edinburghnews.scotsman.com/news/survey-warns-city-centre-losing-litter-battle-1-3499305.

[43] Paul Hutton, interviewed by author, Edinburgh, Scotland, July 26, 2014.

[44] Karen King, phone conversation with author, July 24, 2014.

conservation concerns. In 2010, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Committee launched the Urban Regeneration Project for Historic Cairo as part of a technical assistance package for the Cairo World Heritage Site. The Cairo World Heritage Site, inscribed in 1979, wanted to design a waste management system to be incorporated into the framework of overall site management. Consultants studied how historic Cairo's urban form affected possible collection modalities and costs.[45] Quite apart from the fact that such a thorough study of waste management practices in an historic site may be literally unprecedented, the study was sensitive to cultural practices as well as architectural or urban forms. For example, the historic quarters of Cairo have a large population of traditional garbage pickers, who collect almost all household rubbish for reuse or recycling. The study suggests that a modernised, holistic waste management system should incorporate this traditional practice because it is cost effective, increases recycling and results

[45] Lise Debout, Preliminary Study of Waste Disposal Management in Historic Cairo (Cairo: Urban Regeneration Project for Historic Cairo, 2012), 27.

in the absence of bins and other intrusive collection systems in the historic streets.[46]

Design

Waste management systems in sites of historic/architectural significance need to meet competing demands: they must actually facilitate storage and collection of waste (refuse, recyclables and litter) as well as conform to the character of the site. Rarely, however, are both demands well met. Too often, neither aim is served adequately. In addition, streetscape design that avoids clutter is often at odds with the need for bins at regular intervals or in areas of high use.

A promotional flyer for Glasdon, the manufacturer of the grandiloquently named "Brunel" litterbin commonly found in the Old and New Towns of Edinburgh World Heritage Site, notes that litter bins need to be practical, with minimal maintenance needs, corrosion-resistant and have lightweight liners that are simple and easy for workers to empty. The flyer also notes that it was "very important that the design complemented

[46] Debout, 22.

historical environment of Edinburgh" and not stain granite pavements.[47] The Brunel's design (Illustration 12) may work well in the Georgian New Town but it is less coherent with the medieval Old Town context.[48]

A design similar to that used in the Nuremberg Altstadt (Illustration 13) would be more appropriate in Edinburgh's Old Town streetscapes.

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[47] "Focus On Low Maintenance Litter Bin for City of Edinburgh Council," Glasdon, accessed July 5, 2014, http://gil.glasdon.com/downloads/case_studies/Brunel_Neopolitan_Litter_Bins_City_of_Edinburgh_Council.pdf.

[48] It's worth noting in this context that, while the "Brunel" is the most recent choice of the City of Edinburgh Council, at least nine other designs of litterbins can be found in the World Heritage Site. This inconsistency itself is a problem for conservation, both in the design sense but also because it's likely to increase litter; when people can't easily identify litter receptacles because there is no predictable pattern, no "brand" as it were, they're more likely to toss their refuse on the pavement. In the case of a site like Edinburgh, where protected areas have very different architectural styles, consistency in brand could be achieved by common elements such as colour or signage. (It's perhaps also notable that the "Brunel" is the litterbin shown in Illustration 4.)

Stirling, Scotland seems to have successfully incorporated waste collection in its city centre (Illustration 14).

Bins are placed at approximately 50 metre intervals along its high street.[49] Trade waste and recycling receptacles are stored away from pavements. Litterbin design is coherent with the overall character of the streetscape and other furnishings. Indeed, the furnishings could be seen to have a unifying effect, mitigating the contrast between the historic buildings and the otherwise non-contributing modern shop fronts.

In the Prague World Heritage Site, a single street bin design has been deemed compatible with the diverse architectures of the city, from Renaissance to Art Deco (Illustration 15). It works well, as the materials are solid and the design stylish but neutral. One wonders whether the expense of such a receptacle restricts its use, since the metal bins are placed only sparingly,

[49] Stirling has noticeably less litter than cities, such as Edinburgh, that have removed street bins out of a conviction that more bins lead to more litter, or at least to increased collection costs. Research has proven that such convictions are baseless; see Dominic Rustecki, The Big Green Society: Empowering Communities to Create Cleaner, Greener Neighbourhoods (London: Localis, 2011), 10-11.

along main streets and pedestrian zones; more utilitarian ones are used, plentifully, on side streets and in parks (Illustration 16, which depicts a small park in which the author counted ten green plastic litterbins).

Like Stirling, Prague is remarkably free of litter, except for cigarette butts, which are ubiquitous and often trapped in the cobbles of older streets and between the small pavers of sidewalks in older parts of the central city.

Neither the metal nor plastic litterbins have receptacles for smoking materials.

Bamberg University, located within the Bamberg World Heritage Site (inscribed 1993) makes little effort to align the design of its outdoor furniture with the character of its historic buildings (Illustration 17). However, the

design of the litterbin is actually quite clever as it's generous size promotes responsible disposal of cigarette remains since it doesn't fill up more rapidly than maintenance staff can empty. This design prevents the otherwise common and unfortunate task of prising rain-soaked butts from the too small compartments found on other bins (Illustration 18).

Stellenbosch, South Africa also acknowledges that people *will* smoke and prevents the negative consequences of litter and pavement staining along its historic Dorp Street by providing stand-alone cigarette butt receptacles (Illustration 19).

The design is rather neutral and works well with the agricultural, frontier-like feel of the city.

The small size of litterbins may make it easier for historic sites to afford designs that are compatible with the site's architectural style(s) or historic characteristics. Receptacles for residential and commercial waste and recyclables are much more challenging, and instances of successful design integration much more rare. The system used in the V & A waterfront historic district in Cape Town, South Africa doesn't pretend to be of a style with the colonial buildings found in the area, but it is not incongruent with the traditional quayside commercial architecture close by (Illustration 20).

It's neat and functional and appears to be successful in preventing litter and encouraging recycling. Similarly, while the in-ground recycling depots in the Grassmarket area of Edinburgh's Old Town (Illustration 21) are not things of beauty, they have partly mitigated a much worse eyesore: the blizzard of

litter that formerly filled the open space each weekend and during the annual festival season in August.

Edinburgh, as will be explored later, seems to prefer utilitarian approaches to residential and commercial waste management systems. Or at least the local authority doesn't appear overmuch concerned with aesthetics or compatibility of design. Communal bins have been successfully screened at other sites like the Colorado Chautauqua (Illustration 22).

Edinburgh places such bins directly on the street in front of, and across from, entrances to listed buildings (Illustration 23).

This shouldn't be seen as an argument against communal bins per se. From a conservation perspective, these are are far preferable to other systems, including gull proof bags. Edinburgh World Heritage and Historic Scotland both consulted on the placement of the bins; Edinburgh World Heritage surveyed each street in a pilot project area to identify placement opportunities that would affect historic streetscapes the least. Where possible, communal bins are sited below the crest of a hill or on the gable

end of a terrace, for example.[50] One wonders, however, if conservationists attempted to influence the Edinburgh Council's choice of actual bin design.

City centre Edinburgh's systems for recycling are also not designed for compatibility with its status as a World Heritage Site. In much of the New Town, household recyclables are simply deposited in a container placed on the street for bi-weekly collection. The complexity of Edinburgh's current system—which, to be fair, is in the midst of a rationalising reform process—means that some households in the World Heritage Site have up to ten different bins, boxes, or bags to sort their rubbish and recyclables and up to four different collections a week. It also means that the pavements of the New Town are usually an unsightly mess of bins, boxes and bags (Illustration 24).

[50] Alex Wilkinson, interviewed by author, Edinburgh, Scotland, July 24, 2014.

The Old Town is served no better; most residents who recycle must use the few communal depots. Demand exceeds capacity and the bins are often overflowing; it also appears that residents mistake the depot for a communal rubbish bin, or merely leave their household bin bags there without necessarily intentionally fly tipping (Illustration 25).

To be fair, other heritage sites have eyesore waste management systems that could easily be improved by attention to compatibility with their architectural context. Nuremberg, Germany has cleverly used banks of vaults built into retaining walls or sides of buildings as communal recycling and waste depots. However, the vaults are poorly maintained and presently constitute a threat to the historic character of the streets in which they are located (Illustration 26).

Again in the interest of fairness, it should be noted that Edinburgh has done something really clever with waste management systems in the limited area of the Princes Street Gardens, which literally separate the Old and New Towns. Large bins, which require less-frequent emptying (thereby saving labour costs), also serve an interpretive function as they are covered with historic photographs of Edinburgh (Illustration 27, below left). Also in the Princes Street Gardens, large recycling receptacles have been installed as part of a pilot program (Illustration 28, below right). These receptacles have in-ground vaults, which again means less frequent emptying and cost-savings. Both the general waste bins and the recycling receptacles are covered in graffiti- and vandalism-resistant materials. Council cleansing department staff report few instances of vandalism since the bins were

placed, as well as significant decreases in litter and an increase in recyclables collected from the Gardens.[51]

Policy, Planning and Politics

In 1987, the ICOMOS General Assembly adopted the Charter for the Conservation of Historic Towns (the Washington Charter), which states that conservation "should be an integral part of coherent policies of economic and social development and of urban and regional planning at every level."[52] This principle is applied inconsistently across the map. It is embraced with more vigour in Europe, where legislated regulation and centralised planning has supported conservation and waste management aims since the end of World War II. Indeed, many European nations enact all sorts of planning

[51] Paul Hutton, e-mail to author, July 27, 2014.

[52] ICOMOS General Assembly, Charter for the Conservation of Historic Towns and Urban Areas: The Washington Charter (Paris: ICOMOS, 1987).

within a European legislative context: for example, the current Waste Management Plan for England was required under the European Union Waste Framework Directive.[53] In developing nations, unless accompanied with funding and technical assistance, integration of conservation with national regulation or urban and regional planning is more rare.

The United States' federal system means that only activities of the federal government itself are subject to national-level regulation and planning. Even state-level legislation regarding planning and development is rare, and generally concerned with natural resource extraction and agriculture, or balancing the demands/influence of metroplexes with the needs of non-urban areas. Most communities regulate at the level of building codes, health codes and zoning. Some municipalities have comprehensive plans, but only a fraction of American towns and cities have any sort of historic preservation policy or planning mechanisms.

[53] Department for Environment, Food and Rural Affairs, Waste Management Plan for England (London: DEFRA, 2013).

By contrast, in Scotland, the nexus of waste management and conservation is grounded in a complex of policy and legislation. In terms of planning, the highest but also most general level is the National Planning Framework (NPP), which in turn guides the Scottish Planning Policy (SPP) implemented through National Planning Policy Guidelines. For the most part, these guidelines reflect the various and evolved requirements of Town and Country Planning (Scotland) Acts and Orders passed by Parliament in the post-war period. The most recent NPP and SPP were published on June 23, 2014.[54]

SPP will have implications for waste management practices at Scottish sites of historic/architectural significance, particularly in its emphasis on planning for zero waste.[55] Waste (Scotland) Regulations 2012 reflect the Scottish Government's zero waste aspirations by mandating recycling, targeting businesses and local authorities. Interestingly, Scotland's new

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[55] Scottish Government, Scottish Planning Policy (Edinburgh: Scottish Government, 2014), 41. The Scottish Environmental Protection Agency launched an ambitious Zero Waste Plan in 2010, calling for 70% recycling rates and composting by all residences and businesses by 2025. See Natural Scotland, Zero Waste Plan for Scotland: What Does It Mean for Me? (Edinburgh: Scottish Government, 2010).

historic environment strategy makes no mention of waste management, zero or otherwise. Still, conservationists should note the strategy does suggest, "We should do more to conserve the wider setting and context of our historic assets."[56] This sensibility may support increased efforts to institute conservation-sensitive waste management approaches at Scottish sites of historic/architectural significance, especially if such efforts reference longstanding guidance that local authorities should "pay special attention to preserving or enhancing the character or appearance of conservation areas".[57]

Within the realm of waste management, Scotland appears to be targeting litter with some urgency, and has the regulatory and policy framework in place to do so. Standards for municipal waste management are set forth in the Code of Practice on Litter and Refuse (Scotland) 2006. The Environmental Protection Act (1990) mandates that responsibility for litter,

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[56] Scottish Government, Our Place in Time: The Historic Environment Strategy for Scotland (Edinburgh: Scottish Government, 2014), 9.

[57] Scottish Government SPP 23: Planning and the Historic Environment. Edinburgh: Scottish Government, 2008.

"lies with local authorities and statutory undertakers such as Network Rail, Scottish Canals, and also schools, colleges and universities."[58] Scotland's litter problem is chronic, and costly. £53 million in public funds is required annually to address more than 250 million items of litter and 61,000 incidents of fly tipping.[59] A National Litter Strategy, "Towards a Litter-free Scotland," was launched on June 12, 2014 and will be implemented by Zero Waste Scotland, an agency funded by the Scottish Government. Early key actions include a public awareness campaign, Dirty Little Secrets (Illustration 29);

[58] Scotland.gov.uk, "Tackling Scotland's Littering Problem," accessed July 4, 2014, http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1/whodoeswhat/SharedResponsibilities/Litterandflytipping.

[59] Scotland.gov.uk. "Tackling Scotland's Littering Problem".

increasing the fixed penalties for littering and fly tipping; instituting a 5p charge for single-use shopping bags; and funding for the Clean Up Scotland campaign conducted by a separate organisation, Keep Scotland Beautiful.[60] The National Litter Strategy seeks to succeed where past efforts have failed; research suggests that increased fines have little utility in thwarting people who litter, often because local authorities do not have the law enforcement capacity to charge offenders and Procurators Fiscal tend to focus on higher-level offences.[61] Even before fines were raised nationally, Edinburgh had an £80 penalty for littering but few litterers were punished due to insufficient numbers of wardens and pre-occupied Procurators Fiscal.[62]

Where waste management is concerned generally, but also with regard to protected historic resources, regulation and policy can only do so much. Local authorities and communities need to understand best practices,

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[60] Scottish Government, Towards A Litter-Free Scotland: A Strategic Approach To Higher Quality Local Environments (Edinburgh: Scottish Government, 2014).

[61] Yvonne de Kort, L. Teddy Calley, and Cees Midden, "Persuasive Trash Cans: Activation of Littering Norms by Design," Environment and Behavior 40 (2008): 870-91; Allan Lewis, Polly Turton, and Thomas Sweetman, Litterbugs: How to Deal with the Problem of Littering, 25.

[62] Paul Hutton, interviewed by author, Edinburgh, Scotland, July 26, 2014.

have the right tools and technologies, deploy appropriate management approaches (such as flexible scheduling to respond to needs rather than by rota), and secure sufficient funds to successfully implement policy.[63] Some foresight is also required when policy developed and issued. When the Scottish ban on indoor smoking was passed in 2006, followed by England in 2007, it should have been predicted that out of doors smoking and, with that, demand for street ashtrays and butt receptacles would increase. However, in most British cities the ban was not accompanied by more such facilities, or by prevention campaigns targeting cigarette littering even though it was already known that smoking-related materials are the largest component of litter collected and that smokers are highly likely to litter.[64] It's

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[63] Allan Lewis, Polly Turton, and Thomas Sweetman, Litterbugs: How to Deal with the Problem of Littering, 27. Paul Hutton also noted that his department didn't have enough funding to adequately address litter and refuse collection in the Old and New Towns of Edinburgh World Heritage Site. This translates into out-dated equipment, insufficient staffing and little ability to tackle specialised waste removal such as that caused by dog-fouling, which is legally considered clinical waste and should be removed with a "poo hoover."

[64] Vilma Patel, George Thompson, and Nick Wilson," Cigarette Butt Littering in City Streets: A New Methodology for Studying and Results," Tobacco Control 22 (2013), 59-62. Many smokers report that they don't consider disposing of their butts outwith designated receptacles to be littering. The Patel study found that 76.7% of smokers were observed

not surprising, then, that there has been a significant increase in littering of smoking-related materials. In historic sites, the Durham and Edinburgh World Heritage sites with their cobbled streets or the Colorado Chautauqua with its century-old wooden buildings, cigarette litter poses an active threat to the historic environment. In Edinburgh, too, public health planning and conservation priorities clashed; when pub landlords in conservation areas responded to the demand for out of doors receptacles by posting them on their facades, they were directed to remove them and apply for planning permission.[65]

Consistency and coordination within local government in implementing and enforcing public policy are also key in protecting sites of historic/architectural interest. The question of subjectivity in interpreting policy and guidance is a frequent topic of conversation among

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discarded their butts inappropriately; "some littering occurred directly beside bins with butt receptacles" (60).

[65] "Complaints blitz puts outside ashtrays for smokers in dowt," The Scotsman, February 27, 2006, accessed June 22, 2014, http://www.scotsman.com/news/health/complaints-blitz-puts-outside-ashtrays-for-smokers-in-dowt-1-982256. It may well be that the receptacles warranted planning review; however, such a requirement could have been foreseen when the smoking ban was issued.

conservationists. In Boulder, Colorado the Landmarks Board has been known to base decisions on the rubric of what members consider "ugly". A waste manager reported that the success of projects often "depends on the planning officer and what he or she requires."[66] In Edinburgh, two completely distinct departments with very different levels of funding handle residential waste/recycling and street cleansing/refuse removal, even though street cleansers remove significant amounts of residential and trade waste. (Trade waste is collected by at least nine different private companies.) In 2003, waste managers purchased equipment costing over £100,000 to remove chewing gum and graffiti in the city centre; according to the Council planning department, the techniques used would cause permanent damage to pavements and buildings.[67]

An official in the waste management department stated that the "historic nature of Edinburgh plays a big role" in how her department operates, citing consultation with Edinburgh World Heritage and Historic

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[66] Karen King, phone conversation with author, July 24, 2014.

[67] "'Dirty row leads to mud-slinging'," Scotsman, February 28, 2008, accessed June 17, 2014,http://www.scotsman.com/news/dirty-row-leads-to-mud-slinging-1-871170.

Scotland for the next phase of its Modernising Waste Project focused on recycling and food waste.[68] Yet, Edinburgh Council's Waste Prevention Strategy contains not a single word regarding the unique waste management concerns of the Old and New Towns of Edinburgh World Heritage Site or of the city's forty-nine conservation areas.[69] There may be reluctance, in Edinburgh and elsewhere, on the part of public managers to be seen treating protected areas or structures differently when it comes to public realm issues. People understand that a listed or landmarked building might be subject to special review when demolition or construction is proposed, but the perception seems to be that it's unfair to treat residential areas, especially when it comes to municipal services, simply because of their historic character. One manager remarked, we "try not to treat areas differently just because they are conservation areas."[70] This wariness may

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[68] Hema Herkes, phone conversation with author, July 22, 2014.

[69] "Waste Prevention Strategies, "City of Edinburgh Council, accessed July 17, 2014, http://www.edinburgh.gov.uk/info/20185/waste_and_recycling/43/waste_prevention_strategy.

[70] Karen King, phone conversation with author, July 24, 2014.

well be warranted: a recent online comment from Misspumpkin responding to an August 4 article about the installation of communal rubbish bins on several streets in Edinburgh's New Town read, "Ah the fur coat and nae breeks brigade are out in force again! You live in a house or flat in a street and you have rubbish to dispose of. Never mind playing the heritage game, you're no different from the rest of us…Fancy addresses do not entitle you to special attention." Another of the forty-two comments, this from thejets, made this suggestion: "how about making the bins in the shape of a Bentley? That should keep the residents happy."[71]

[71] "New Town black bins are 'waste of space'," Edinburgh Evening News, August 4, accessed August 6, 2014, http://www.edinburghnews.scotsman.com/news/politics/new-town-black-bins-are-waste-of-space-1-3498160.

A Case of Integration/A Case of Fragmentation

The following case studies examine, but do not compare in any way, two very different sites. The first, the Colorado Chautauqua, located in Boulder, Colorado, gained status as a United States National Historic Landmark in 2006; there are currently just over 2,500 National Historic Landmarks, sites that have national importance in United States history. The second, the Old and New Towns of Edinburgh World Heritage Site was inscribed by UNESCO in 1998; it is one of 1007 World Heritage Sites, each demonstrating Outstanding Universal Value. Both sites illustrate ways in which the conservation concerns explored in the first part of this dissertation can be addressed. The Colorado Chautauqua has, for the last six years, pursued a holistic approach to waste management, one that is tightly integrated into its overall program of historic preservation and site interpretation. The Old and New Towns of Edinburgh World Heritage Site is managed by various entities with varying degrees of consultation and co-ordination, as will be seen in an analysis of the Modernising Waste project. The degree of

integration possible at the Colorado Chautauqua is probably not feasible for a site like The Old and New Towns of Edinburgh World Heritage Site. However, the challenges faced by Edinburgh are certainly more typical of sites—especially urban sites—around the globe.

The Colorado Chautauqua

The Colorado Chautauqua was founded in 1898 as the leading western outpost of the Chautauqua Movement, which began shortly after the Civil War and aspired to bring high-minded intellectual, cultural, and recreational activities to the growing American middle class. By the First World War, thousands of communities across the United States had hosted a summer time "Assembly". In keeping with the Movement's emphasis on healthy outdoor living and reflecting its roots in Methodist camp meetings, most assemblies were held in rural or semi-rural sites, whether a in temporary collection of tents or, like the Colorado Chautauqua, in purpose-built but rustic facilities (Illustration 30).

The Chautauqua Movement began to decline in the late 1920s, unable to compete with Hollywood pictures and Model T holidays; the Great Depression finished it off at all but a handful of assemblies.

The Colorado Chautauqua saw a dwindling in programming and neglect of its facilities but was never abandoned by the Texan, Kansan and Oklahoman families who came every summer to live in the foothills of the Rocky Mountains. The site also persevered because the nearby University of Colorado winterized most of the 100 small cottages to meet the demand for married student housing, as World War II veterans returned to campus. Nonetheless, by the late 1970s, the Colorado Chautauqua was essentially a dilapidated student slum on the edge of Boulder, with occasional second-run movies screened on summer evenings in its Rusticated Romanesque Auditorium.

The Colorado Chautauqua itself was a public-private enterprise right from its founding, with the City of Boulder providing the land and most of the buildings and the Texas-Colorado Chautauqua Association running the programming. In the mid-1970s, the City proposed demolishing the assembly grounds to build a new convention centre. This spurred local preservationists to have the Auditorium, and then the entire 40-acre site, listed on the National Register of Historic Places. Such listings confer no actual legal protection to sites, but they do have enough cachet to enlist community campaigns against demolition. It was only when the Colorado Chautauqua was granted local landmark and historic district status in 1978 that it gained any legal protection, with alterations within the district subject to planning review. [72] The Colorado Chautauqua flourishes as a year-round community within the Boulder city limits; its cottages—some 30 of which are still privately owned by the families that built them in the early twentieth

[72] The grounds and the exteriors of the structures are protected and subject to planning permission; historic or significant interiors in the United States are very rarely legally protected.

century—occupied by a mixture of nightly guests on a self-catering basis and longer-term tenants.

An intensive programme of rehabilitation was begun in the 1980s and in 1989 the district adopted a set of design guidelines that remain the foundation for development and preservation of the site.[73] By 2000, the non-profit Colorado Chautauqua Association had been recognised nationally for its work in returning the appearance of the Colorado Chautauqua to its period of significance, roughly from 1898-1930. The Colorado Chautauqua was one of the first such ensembles to broaden its scope for preservation efforts to include its entire built environment. A cultural landscape assessment and plan now guide rehabilitation and development of streets, paths, gardens and green spaces.[74] Twenty years of evolving preservation work culminated in 2006, when the Colorado Chautauqua became a National Historic Landmark (NHL).

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[73] Landmarks Preservation Advisory Board, Chautauqua Design Guidelines, (Boulder: Department of Community Planning and Development, 1989).

[74] Mundus, Bishop Design, Inc., Chautauqua Park Historic District: Cultural Landscape Assessment and Plan (Boulder: Colorado Chautauqua Association, 2004).

In 2008, the leadership of the Colorado Chautauqua Association determined that the next phase in the evolution of its preservation would be to become the nation's "greenest" National Landmark.[75] The Colorado Chautauqua Association realised that it could save money, more effectively brand the Colorado Chautauqua for contemporary visitors, and forge alliances with Colorado's burgeoning alternative energy sector this way. The Colorado Chautauqua Association board of directors commissioned and set to implementing a comprehensive Environmental Sustainability Plan.

The Colorado Chautauqua's green commitment goes well beyond water- and energy-saving in its operations and programmes.[76] The site has now become a recognised "laboratory" for green preservation technologies. Its long-term preservation plan schedules bricks-and-mortar work well in advance of urgent need; rehabilitation construction projects are far more rare than is routine maintenance and eco-retrofitting. The fact that its

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[75] Colorado Chautauqua Association, "Sustainability," accessed May 27, 2013, http://chautauqua.com/sustainability_reduce.html

[76] Such measures include paperless administrative offices, an experimental "waterwise" garden, and requiring zero-waste practices from the concession that operates the Chautauqua Dining Hall.

wooden, vernacular cottages tended to have been built row-by-row in a single particular year upon identical plans enables the Colorado Chautauqua Association's preservation staff to explore different treatments on side-by-side cottages and evaluate environmental and conservation performance (Illustration 31).

The Colorado Chautauqua Association's managers strive to keep the overall emphasis of their work on conservation, however important being "green" has become. Facilities and Preservation Manager Jeff Medanich stresses, "We never lose sight of the fact that we've been here over a century; preservation comes first."[77]

[77] Conversation with author, September 23, 2012.

Sustainable waste management is completely integrated into the Colorado Chautauqua Association's physical conservation work and with impressive results: sixty-five percent of its construction waste is reused or recycled. Waste management has also been integrated into the life of the site, and has become one important way residents, guests and day visitors alike join the professional maintenance and conservation staff in caring for the site.

The Colorado Chautauqua's site presents interesting challenges in waste management. Although only about 350 people reside or work in the site, it has retained its original 1898 plat, which was designed to maximize the Assembly's revenue by fitting the maximum number of residential and programming tents possible within the site. Density is almost urban, with cottages close to one another and few service roads or alleys where conventional waste storage might be located (Illustration 32, next page). Until about 2003, residents of the Colorado Chautauqua disposed of their waste as most residents of Boulder did: they paid a private contractor (in this case, a contractor with whom the Colorado Chautauqua Association had an

exclusive arrangement) to regularly collect rubbish from cans or bins at the edge of their cottage's lot.[78] However, increasingly in the late 1990s, Boulder

[78] Boulder property owners are required to keep trash contained and collected appropriately; no plastic bags or large refuse items may be placed in alleys or streets.

neighbourhoods—like the Colorado Chautauqua—located adjacent to the undeveloped open space of the foothills of the Rocky Mountains began to report not just sightings of black bears, but home break-ins by bears seeking a free meal. The decision was taken by the Colorado Chautauqua Association to centralise waste collection at specific depots around the site. (The current locations of waste depots are indicated on Illustration 32 by black rectangles labelled "TR" in white). Standard public trash cans around the site were replaced with bear-proof receptacles and then, after 2008, by bear proof trash and recycling stations (Illustration 33).

"Revised Code, Chapter 6," City of Boulder, Colorado, accessed July 6, 2014, http://www.colocode.com/boulder2/chapter6-12.htm.

The Colorado Chautauqua Association has consistently been supported in its move toward integration of waste management with overall conservation work by the City of Boulder. This is partly because the City retains ownership of the land on which the Colorado Chautauqua is located and of several public buildings, including the Auditorium and Dining Hall.[79] The City has also developed a regulatory and enforcement framework for waste that aligns with, and in some cases emulated, the Colorado Chautauqua Association's practices. For example, since 1999, the Colorado Chautauqua Association has selected waste management contractors in a bidding process that included the ability to support single-stream recycling; the City required all private trash haulers to make single-stream recycling available to their customers several years afterwards. Bear proof trash cans

[79] "Ownership" at the Colorado Chautauqua is somewhat complicated: the City of Boulder owns the land, the Auditorium, the Dining Hall, and Academic Hall. It has rented these assets to the Colorado Chautauqua Association on a series of twenty-year leases for a token amount. In return, the Colorado Chautauqua Association is financially responsible for care of the land and preservation of the City-owned buildings. The City also appoints several members of the Colorado Chautauqua Association Board of Directors. The Colorado Chautauqua Association owns just over 70 structures within the historic district, mainly small residential cottages. Private families own the rest of the cottages and sub-lease the plots on which they sit from the Colorado Chautauqua Association.

for Boulder properties adjacent to mountain open space became mandated by City ordinance only this year.[80] Boulder County, too, has adopted regulations that reflect the Colorado Chautauqua Association's waste management ethos; its Zero Waste Action Plan (tagline: "Zero Waste or Darn Near") was adopted in 2010, and, among other measures, requires the county to reuse or recycle its construction waste.[81]

Two aspects of the Colorado Chautauqua's efforts to integrate waste management and conservation aims have been particularly successful: engagement of site users (staff, visitors and residents) in caring for the site and the design and placement of waste collection depots. The Colorado Chautauqua Association itself (through programming, the Green at the northern end of the historic district, and the Chautauqua Dining Hall) and the Boulder County Open Space and Mountain Park lands that surround the

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[80] Erica Meltzer, "Roll-Out of Required Bear-Resistant Trash Cans Not Likely Until June," Boulder Daily Camera, April 21, 2014, accessed July 14, 2014, http://www.dailycamera.com/news/boulder/ci_25608840/boulder-roll-out-required-bear-resistant-trash-cans.

[81] "Waste Services," Boulder County, accessed June 15, 2014, http://www.bouldercounty.org/env/sustainability/pages/wasteservices.aspx.

district on three sides attract more than a million visitors each year. Yet litter is extremely rare within the site, even on nights when concerts draw several thousand audience members to the Auditorium or on July Fourth, when the Colorado Chautauqua stages a large Independence Day celebration. This is due to strategic placement of bins, deployment of additional temporary receptacles during periods of high use, and frequent emptying of bins to prevent overflow.[82] The Colorado Chautauqua Association also emphasises the historic nature of the site and its current "green" commitments on interpretive signage throughout the district. Trash depots are clearly indicated on the maps (Illustration 32) distributed to visitors and posted at key entry points. The depots are cleverly labelled: "compost", "recycling" and, best of all, "landfill" to encourage users to engage in sustainable waste practices (Illustration 34).

[82] In contrast, litter can often be found just outside the site and east of the historic district, along Baseline Road, where there are no bins to accommodate pedestrians.

The design and placement of the Colorado Chautauqua's waste collection depots was carefully developed to be compatible with character-defining features of its built environment, to conform to the Design Guidelines and to protect views and view sheds (Illustration 35).

Design and placement also takes servicing by large vehicles into account; depots are located in service alleys and have wide openings with double doors to enable easy collection of the large metal receptacles by hydraulic lift-equipped collection trucks (Illustration 36).

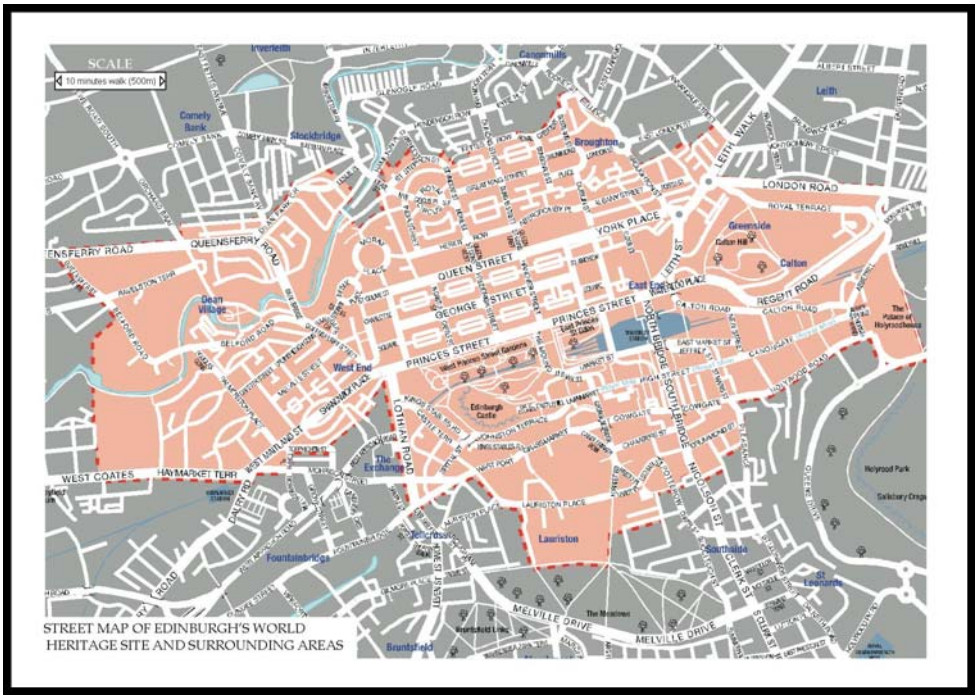
Trade waste generated by the Dining Hall and its associated catering business, which operate at full capacity seven days a week year-round, is stored in and collected from a location that needed special consideration since it is adjacent to the Centennial Garden, along a much-frequented pedestrian route and proximate to at least four contributing structures (two of which are residences). The demand was for a large depot, which would necessarily block former views into the Centennial Gardens (Illustration 37).

The design solution (Illustration 38) was cleverly expanded to include parking areas for Colorado Chautauqua Association utility vehicles, a garden

compost heap and storage for maintenance equipment. At the same time, the high fence along which flower borders have been planted forms an attractive boundary feature for the Centennial Garden and enhances its intimate feeling.

The Old and New Towns of Edinburgh World Heritage Site

Edinburgh, being more famous and familiar to readers, requires a bit less description than does the Colorado Chautauqua! In brief, the Old and New Towns of Edinburgh World Heritage Site encompasses about 1.75 square miles of central Edinburgh (Illustration 39).



The Old and New Towns of Edinburgh World Heritage Site includes a wide array of architectural styles and historic sites with the medieval form of the Old Town and the Georgian plan and architecture of the New Town being signal contributors to its Outstanding Universal Value. Seventy-five percent of buildings within the site are listed. Four conservation areas overlap the Old and New Towns of Edinburgh World Heritage Site: Edinburgh Old Town, Edinburgh New Town, West End and Dean Village. This means that it is not just structures are subject to planning review, but also natural features like parks and plantings and elements of the public realm such as street lighting, paving, street furniture, and waste

management receptacles.[83] Edinburgh, and hence the Old and New Towns of Edinburgh World Heritage Site, hosts more than four million visitors each year; it is second only to London as a United Kingdom tourist destination. 24,000 people live within the Old and New Towns of Edinburgh World Heritage Site.[84] 85,000 people work at business located within the site.[85]

As mentioned throughout this dissertation, the Old and New Towns of Edinburgh World Heritage Site is an inherently challenging site for effective waste management. For example, in the Old Town alone six and a half miles of narrow closes require cleansing, litter removal and animal waste containment that cannot be done by mechanised means (Illustration 40).[86]

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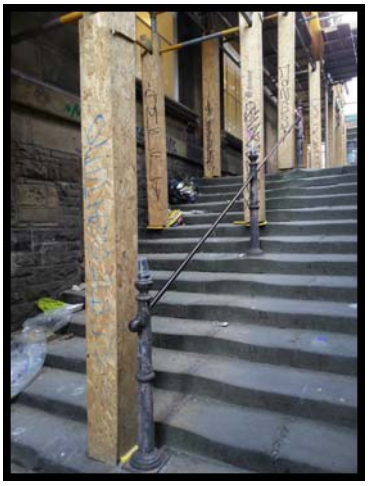
[83] Edinburgh World Heritage, "Managing the World Heritage Site," accessed March 25. http://www.ewht.org.uk/managing-the-world-heritage-site.

[84] In the interest of full disclosure, the author is one of them.

[85]Graeme Gainey, Jack Gillon, and Murray Wilson, The Old and New Towns of Edinburgh World Heritage Site Management Plan, 2011-2016 (Edinburgh: City of Edinburgh Council and Edinburgh World Heritage, 2010), 51.

[86] Paul Hutton, conversation with author, July 27, 2014.



Flyers and stickers advertising Edinburgh frequent festivals and concerts leave traces and damage on buildings, pavements and street furniture long after the event. Ubiquitous and character-defining iron railings in the New Town often serve as informal collection points for litter (Illustration 41) and trap blowing litter, there to remain until it disintegrates.

Exacerbating the inherent challenges to effective waste management are public behaviours such as littering (Illustration 41; an unintentionally ironic photograph of litter in the Old Town's Geddes Gardens, named in honour of Patrick Geddes, a pioneering conservationist), fly tipping (Illustration 42) and improper storage, placement or containment of residential waste (Illustration 43).

The Old and New Towns of Edinburgh World Heritage Site also has a concentration of commercial activities: small business, multi-national chains including many fast food outlets; and many pubs, clubs and restaurants. Commercial waste storage and collection, while in theory regulated by the City of Edinburgh and Scottish law, is a major contributor to street clutter and litter.[87] Businesses contract with one or more of the many, many private

[87] Alex Wilkinson, conversation with author, July 24, 2014 and Paul Hutton, conversation with author, July 27, 2014.

contractors whose standards vary from the environmentally conscious and conservation-committed Changeworks to unnamed companies whose drivers throw sandwich wrappers from the windows of their lorries. Not only is the accumulation residential refuse, litter, and trade waste unsightly and potentially damaging to buildings and surfaces in the Old and New Towns of Edinburgh World Heritage Site, Edinburgh is now experiencing unprecedented levels of rat infestation.[88]

Edinburgh residents, their own actions notwithstanding, perceive their city to be exceptionally filthy.[89] The city centre, located entirely within the Old and New Towns of Edinburgh World Heritage Site, has not passed a Keep Scotland Beautiful cleanliness survey since the survey programme was

[88] "Rat Infestations Soar in Edinburgh, *"Edinburgh Evening News*, April 15, 2014, accessed May 16, 2014, http://www.edinburghnews.scotsman.com/news/rat-infestations-soar-in-edinburgh-1-3376646.

[89] Interestingly, a slim majority of tourists surveyed on the Royal Mile said they didn't find Edinburgh all that dirty, saying it was "about the same" or "cleaner" than other historic cities they had visited. However, tourists surveyed on George Street and Queen Street in the New Town evaluated Edinburgh much less favourably. This may be due to the more closely spaced litterbins along the Royal Mile. The High Street is also cleansed more often than other parts of the city, according to the street cleansing department.

initiated in 2011; the most recent survey awarded central Edinburgh sixty-six points, at least ten points lower than any other district in the city.[90]

Council- and public-employee blaming seems to be a sport in Edinburgh. Some residents wonder whether dirty streets and irregular or incomplete collection reflects a legacy of discontent rooted in a labour action by bin workers in 2008. It was difficult to determine if truth matches that perception; bin workers refused to be interviewed and Council officials did not return repeated calls. However, evidence does point to long-standing mismanagement by Council of waste systems in the Old and New Towns of Edinburgh World Heritage Site and across Edinburgh. In 1996, the Council removed more than 1800 street litterbins, only to contend with greatly increased amounts of litter along streets and, especially, outside fast food outlets and by bus stations. After a public campaign, the Council re-installed 380 street bins within the city centre.[91]

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[90]"Survey warns city centre losing litter battle," Edinburgh Evening News, August 5, 2014, accessed August 7, http://www.edinburghnews.scotsman.com/news/survey-warns-city-centre-losing-litter-battle-1-3499305.

[91] "Wasted chances? Bin there, done that," *The Scotsman*, September 3, 2003, accessed June 22, 2014, http://www.scotsman.com/news/wasted-chances-bin-there-done-that-1-891319.

2003 was a singularly bad year for conservation-oriented waste management in the Old and New Towns of Edinburgh World Heritage Site. As part of a plan to increase litterbin placement throughout the city (which would bring the number above the 1996 amount), the Council's environmental department installed street litterbins in Adam-designed Charlotte Square, along Heriot Row and down Dundas Street without seeking planning permission as required by Scottish planning law.[92] Streets within the World Heritage Site had originally been exempt from the otherwise citywide adoption of large communal bins and larger wheeled residential containers in replacement of regular collection of plastic bin bags from pavements. However, communal bins were proposed to be installed on certain New Town streets and a battle royal ensued. Opponents of the big black bins threatened the Council with legal action and appealed to the

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[92] "City set to junk its own new litter bins" The Scotsman, February 21, 2003, accessed June 22, 2014, http://www.scotsman.com/news/city-set-to-junk-its-own-new-litter-bins-1-870462.

Prince of Wales to endorse their campaign, which he did.[93] The bins were to be installed without planning permission, which in the case of projects carried out by the City of Edinburgh Council, is granted by the Scottish Government. Historic Scotland was able to successfully argue that the bins were "out of keeping with the historic streets."[94]

Despite the furore a decade ago, black communal bins are now present on most residential blocks in the Old and New Towns of Edinburgh World Heritage Site. In 2003, opponents were prepared to resort to European human rights law and even to UNESCO.[95] In 2014, opposition was present, but muted. One campaigner, Marion Williams of the Cockburn Association, admitted to being worn down. "Communal bins are the wrong solution, " she stated, "but it's the fix-it-now, cheapest solution." Cost-

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[93] "Bin battlers have wheelie important ally," *Herald Scotland*, July 8, 2003, accessed June 22, 2014, http://www.heraldscotland.com/sport/spl/aberdeen/bin-battlers-have-wheelie-important-ally-1.114115.

[94]"Watchdog joins fight to scrap wheelie bins," The Scotsman, July 4, 2003, accessed June 22, 2014, http://www.scotsman.com/news/watchdog-joins-fight-to-scrap-wheelie-bins-1-884415. This argument begs the question of Historic Scotland's lack of advocacy in preventing the placement of such bins in other Edinburgh conservation areas.

[95] "Bin protesters call in the UN," The Scotsman, February 11, 2004, accessed June 22, 2014, http://www.scotsman.com/news/bin-protesters-call-in-the-un-1-923046.

savings appears to be a Council priority; in reporting progress on its Pledge (Number 44), to "Prioritise keeping our streets clean and attractive" the Council highlights the removal of £485,000 from the street cleansing budget. Clearly, then, the Edinburgh Council—the most powerful and resourced stakeholder in the Old and New Towns of Edinburgh World Heritage Site—privileges other public infrastructure expenditures over the historic fabric and character of the Old and New Towns of Edinburgh World Heritage Site.[96]

Even the one initiative that seemed to promise a more strategic, co-ordinated approach to waste management in the Old and New Towns of Edinburgh World Heritage Site has been problem-ridden, behind schedule and questionably effective. The Modernising Waste Project was set up in 2010 to identify appropriate new ways to collect waste in Edinburgh's city centre "taking into account the issues associated with World Heritage Status."[97] Beginning in 2011, a variety of methodologies were trialled: gull proof bags, extending evening collections, communal street bins, household

[96] Requisite veiled reference to the tram works.

[97] City of Edinburgh Council, "Modernising Waste Collection in the World Heritage Area" (report presented to the Transport and Environment Committee, Edinburgh, November 29, 2011).

wheeled bins, and specialised food collections.[98] Staff advised Council that planning permission for communal bins would neither be needed nor sought, since they should be considered "permitted development". Since planning law hadn't changed since 2003, it may be that the active co-operation of Edinburgh World Heritage and Historic Scotland in the MWP persuaded them that Council was at last serious about conservation-sensitive waste management.

Three years in, the MWP is a mixed success. Many streets in the New and Old Towns do have communal bins and gull proof sacks, which have been shown in this dissertation to be problematic from a conservation perspective. Many streets are still served by a twice-weekly evening collection of plastic bin bags, which means the sea gulls and other vermin are served a twice-weekly banquet of food scraps that are contained in the bags despite weekly dedicated food waste collections (Illustration 2 and 45, below). This despite

[98] "New Trials Start for Waste Collection in the World Heritage Site," City of Edinburgh Council, April 21, 2011, accessed March 17, 2014, http://www.edinburgh.gov.uk/news/article/464/new_trials_start_for_waste_collection_in_the_world_heritage_site.

target for ending plastic bag collection was November, 2013. In July, 2014, the new project officer reported, "We're eighty-five percent there."[99] Trade waste wasn't addressed by the MWP. Instead Essential Edinburgh, a business improvement association, is undertaking a Trade Waste Initiative in partnership with Changeworks which aims to clear the city centre's lanes and pavements of cluttering bins, litter caused by overflow and to increase recycling by businesses.[100] Quite apart from the Trade Waste Initiative,

[99] Hema Herkes, phone conversation with author, July 22, 2014. Tellingly, the phone number for the Modernising Waste Project listed on the Council's web site is no longer assigned to anyone who works on the project. After repeated calls to the number, I had a conversation with an environmental department employee who said, "yeah, this used to be my boss's number but he hasn't worked here for a while; we still get the odd call about that project, though." He suggested I call the main council number for more information.

[100] "Trade Waste Initiative," Essential Edinburgh, accessed June 27, 2014, http://www.essentialedinburgh.co.uk/projects/facilitation/trade-waste-initiative/.

Essential Edinburgh is deploying its own "clean teams" in the city centre seven days a week during the busy summer tourist season. It's the charge of these teams to remove litter, coordinate deep cleansing and gum removal and remove graffiti and out-dated flyers.

The City of Edinburgh, Edinburgh World Heritage and Historic Scotland jointly created the current Management Plan for the Old and New Towns of Edinburgh World Heritage Site, which includes an objective "To ensure that the work of statutory undertakers and other utility providers meets appropriate quality standards with in the Old and New Towns of Edinburgh World Heritage Site."[101] Objectives 21 and 22 of an accompanying Edinburgh World Heritage Site Action Plan called for special attention to ensuring high quality and consistency in the public realm.[102] No statutory undertaker in the Old and New Towns of Edinburgh World Heritage Site has direct responsibility for public realm, which would include waste

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[101] Graeme Gainey, Jack Gillon, and Murray Wilson, The Old and New Towns of Edinburgh World Heritage Site Management Plan, 61.

[102] "Old and New Towns of Edinburgh World Heritage Action Plan", presented to City of Edinburgh Council Planning Committee, Edinburgh, March 1, 2012.

management, other than civic government. Edinburgh World Heritage and Historic Scotland may consult and advise, but without the will and resources of the Edinburgh Council, it's unlikely that conservation and waste management practices will be successfully integrated within the Old and New Towns of Edinburgh World Heritage Site.

Conclusion: Opportunities for Better Practice and Integration

It would be utopian to think that every site of historic/architectural significance could achieve the integration of waste management and conservation evidenced by the Colorado Chautauqua. But it would be a shame to think that any protected site need to forever struggle on with an array of ad hoc, un-coordinated, ill-informed, out-dated, actively harmful, or at best benignly neglectful waste management practices. This dissertation has pointed out the logical connection between effective waste management and conservation. Specific conservation concerns as they relate to waste management have been explored. The integration or fragmentation of waste management and conservation planning/practice has been assessed in two case studies. What remains is make some suggestions to improve waste management in significant sites and increase integration of waste management and conservation practice.

- The conservation field needs to support significantly more research into the effects that waste has on the fabric of historic sites. This

research would likely lead to improved strategies and techniques for amelioration or prevention.

- Similarly, research should be undertaken and disseminated that can improve waste management and materials recovery/reuse during conservation construction projects. Edinburgh World Heritage has undertaken such studies and uses the data to help property owners with in the Old and New Towns of Edinburgh World Heritage Site.
- Conservation planning frameworks such as planning advice, conservation area character assessments and design guidelines need to take waste management more seriously as an aspect of a site's or area's character and important element of townscape and public realm. Forthcoming efforts by the Edinburgh Council to update some conservation area assessments may provide such an opportunity.
- Conservationists should consult with planning departments to ensure that decisions about practical matters such as placement of litterbins is based upon sound science. Research proves that people litter less

when bins are more plentiful and easy to identify.[103] It has also been demonstrated that littered environments attract additional litter.[104]

- Waste management planning in sites of historic/architectural significance might well be informed by theories like Broken Windows—which posits that small problems in the public realm, like overflowing litterbins, can lead to bigger ones, like fly tipping or even arson—and Nudge, which suggests that small changes in context or environment (such as clever and attractive bin design) can lead to significant change in individual and group behaviours.[105]
- Sites of historic/architectural interest should draw on research that finds positive messages like, "Let's pitch in and help take care of our historic district" are much more effective in persuading people to recycle and dispose of waste responsibly than are "Don't litter" signs

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[103] John D. Cone and Stephen C. Hayes, *Environmental Problems/Behavioral Solutions*, 75.

[104] Melissa Bateson et al., "Do Images of 'Watching Eyes' Induce Behaviour That is More Pro-Social or More Normative? A Field Experiment on Littering," 7.

[105] James Q. Wilson and George Kelling, "Broken Windows," The Atlantic, March, 1982; Jelte M. Wicherts and Marjam Baker, "Broken Windows, Mediocre Methods, and Substandard Statistics," Group Processes and Intergroup Relations 17, no. 3 (2014): 388-403, 388; and Peter John, et al., Nudge, Nudge, Think, Think: Experimenting with Ways to Change Civic Behaviour (London: Bloomsbury Academic, 2013), 3 and 54.

or signs that cite penalties for disobeying waste management regulations (Illustration 46).

- Conservationists should advocate for funding to support proven practical measures like a plentiful supply of bins and increased staffing for litter prevention and mitigation. If dealing with municipal power-that-be, conservationists should argue from the potential for long-term cost savings. One study demonstrated that bins places every block reduced litter by at least ten percent more than when bins were placed at four-block intervals.[106]
- Similarly conservationists can effectively advocate for using existing or underused resources for better waste management in sites of

[106] John D. Cone and Stephen C. Hayes, Environmental Problems/Behavioral Solutions, 75.

historic/architectural significance. What—other than the not insignificant barriers of lack of creative thinking and labour agreements—prevents Edinburgh's ubiquitous parking wardens from using their existing mobile technologies to alert the cleansing and environmental departments to overfull bins or fly tipping?

- Conservationists and planning authorities can easily promote more attractive and efficient waste management systems through better design. The black communal bins on the streets of Edinburgh's conservation areas were chosen for reasons other than compatibility with the character of the areas and were resisted because residents understandably didn't want hulking ugly behemoths opposite their houses.
- Sites of historic/architectural significance should heed an argument that the bin is an important point of contact between individuals and their shared commons.[107] When designing and planning provision for

[107] Heather Chappells and Elizabeth Shove, "Bins and the History of Waste Relations" (paper included in reader for Consumption, Everyday Life and Sustainability Summer School, Lancaster University, 1999), unpaged.

> waste management, sites have an opportunity to, like the Colorado Chautauqua, engage site users in a "conservation activity" simply by using a bin to discard their sandwich wrapper and another bin to recycle their drink bottle.

This is the most important opportunity for conservationists: to channel site users' appreciation for "cleanliness" into something greater: seeing their own participation in good waste management as active stewardship of the site, transforming site users into citizen conservators working in partnership with site managers. Seif Al-Rashidi, the former Durham World Heritage Site co-ordinator observed, "If you have a sense of ownership of a place, you're more likely to take care of it."[108] Maybe, though, it's the obverse. Is it possible that engaging site users in simple ways of caring for a site increases their sense of connection and may lead to deeper involvement such as political advocacy, volunteering or donating money?

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[108] Seif Al Rashidi, phone conversation with author, July 20, 2014.

Bibliography

Architectural Energy Corporation. *A Comprehensive Environmental Sustainability Plan for the Colorado Chautauqua*. Boulder: Architectural Energy Corporation, 2008.

Audit Scotland. *Sustainable Waste Management*. Edinburgh: Auditor General for Scotland, 2007.

Bateson, Melissa, et. al. "Do Images of 'Watching Eyes' Induce Behaviour That is More Pro-Social or More Normative? A Field Experiment on Littering." *PLOSOne* 8, no. 12 (December 2013): 1. Accessed June 15, 2014. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0082055.

Best practice in World Heritage site management. "Vigan Submission." October 25, 2012. Accessed March 25, 2014. http://whc.unesco.org/en/news/948/.

BigBelly Solar. "BigBelly Solar Keeps Bath Clean." Accessed July 15, 2014. http://www.bigbelly.com/bath/

Borges, Maria Anna, Guilia Carbone, Robin Bushnell, and Tilman Jaeger. *Sustainable Tourism and Natural World Heritage*. Gland, Switzerland: International Union for Conservation of Nature, 2011.

Boulder County. "Waste Services." Accessed June 15, 2014. http://www.bouldercounty.org/env/sustainability/pages/wasteservices.aspx.

British Columbia Provincial Government. "Heritage." British Columbia: Business. Accessed July 20, 2014.

http://www2.gov.bc.ca/gov/topic.page?id=57D783A8BE44437C8A4F44FFE69EAF42.

Brown, Terry, Sam Ham, and Michael Hughes. "Picking up Litter: An Application of Theory-Based Communication to Influence Tourist Behaviour in Protected Areas." *Sustainable Tourism* 18, no. 7 (September 2010): 879-900.

Byron, Craig, et. al. "Quantitative Analysis of Litter Composition in a Historic Macon Neighborhood Experiencing Revitalization." *Georgia Journal of Science* 66, no. 2 (2008): 1. Accessed May 17, 2014. http://www.gaacademy.org/GAJSci66-2.pdf.

Canal & River Trust. "Waste Management." Accessed March 25, 2014. http://canalrivertrust.org.uk/our-work/waste-management.

Cardiff Council. "Litter Bin Policy." Report of the Environment Director, Cardiff, April 10, 2014.

Chappells, Heather, and Elizabeth Shove. "Bins and the History of Waste Relations." Paper included in reader for Consumption, Everyday Life and Sustainability Summer School, Lancaster University, 1999.

CHERPLAN. "CHERPLAN." Accessed June 3, 2014. http://www.cherplan.eu/the-project.

City of Boulder. "Boulder Revised Code, Chapter 6." Accessed July 17, 2014. http://www.colocode.com/boulder2/chapter6-12.htm.

City of Edinburgh Council. "Council Pledges: Maintaining and Enhancing the Quality of Life in Edinburgh. " Accessed June 25, 2014.

http://www.edinburgh.gov.uk/info/20153/maintaining_and_enhancing_the_quality_of_life_in_edinburgh/703/pledge_44.

_____. "Capital Coalition Pledges Monitoring Performance." Report to the Council, Edinburgh, November 21, 2013. Accessed May 28, 2014. http://webcache.googleusercontent.com/search?q=cache:eGVXq6pwLPYJ:www.edinburgh.gov.uk/download/meetings/id/41428/item_no_8_2_a_-capital_coalition_pledges_performance_may_to_october_2013+&cd=1&hl=en&ct=clnk&gl=uk.

_____. "Modernising Waste Collection in the World Heritage Area." Report presented to the Transport and Environment Committee, Edinburgh, November 29, 2011.

_____. *New Town Conservation Area Character Appraisal*. Edinburgh: City of Edinburgh Council, 2005.

_____. "New Trials Start for Waste Collection in the World Heritage Site.." April 21, 2011. Accessed March 17, 2014. http://www.edinburgh.gov.uk/news/article/464/new_trials_start_for_waste_collection_in_the_world_heritage_site.

_____. "New Wardens Will Tackle the Capital's Litterbugs.." June 25, 2013. Accessed March 17, 2014. http://www.edinburgh.gov.uk/news/article/1261/new_wardens_will_tackle_the_capitals_litter_bugs.

_____. *Old Town Conservation Area Character Appraisal*. Edinburgh: City of Edinburgh Council, 2005.

_____. "Old and New Towns of Edinburgh World Heritage Action Plan", presented to City of Edinburgh Council Planning Committee, Edinburgh, March 1, 2012.

_____. *Recycling: Communications and Engagement*. Edinburgh: City of Edinburgh Council, no date.

_____. "Recycling Will Be Made Easier for Edinburgh's Flats and Tenements as Part of a New Pilot Recommended for the City.." March 13, 2014. Accessed May 17, 2014. http://www.edinburgh.gov.uk/news/article/1483/simpler_recycling_service_set_for_city_tenements.

_____. *The Edinburgh Standards for Streets*. Edinburgh: City of Edinburgh Council, 2006.

_____. "Waste Prevention Strategies." Accessed July 17, 2014. http://www.edinburgh.gov.uk/info/20185/waste_and_recycling/413/waste_prevention_strategy.

City of Edinburgh Council, Waste Management Division, Partnerships, Performance and Development Sub-division. *Waste Prevention Strategy*. Edinburgh: City of Edinburgh Council, no date.

Colorado Chautauqua Association. The Chautauqua 2020 Plan. Boulder: Colorado Chautauqua Association, 2011.

Cone, John D. and Stephen C. Hayes. Environmental Problems/Behavioral Solutions. Cambridge: Cambridge University Press, 1984.

Dalrymple, Theodore. *Litter: How Other People's Rubbish Shapes Our Lives.* n.p.: Gibson Square Books, 2011.

de Kort, Yvonne, L. Teddy Calley, and Cees Midden. "Persuasive Trash Cans: Activation of Littering Norms by Design." *Environment and Behavior* 40 (2008): 870-91.

Debout, Lise. *Preliminary Study of Waste Disposal Management in Historic Cairo*. Cairo: Urban Regeneration Project for Historic Cairo, 2012.

Department for Communities and Local Government. *Updated national waste planning policy: Planning for Sustainable Waste Management—Consultation*. London: Department for Communities and Local Government, 2013.

Department for Environment, Food and Rural Affairs. *Waste Management Plan for England*. London: DEFRA, 2013.

Durham County Council Neighbourhood Services. *Refuse and Recycling Policy*. Durham: Durham County Council, 2011.

Emery, Steve. *Fire Safety in Historic Town Centres*. London: English Heritage, no date.

English Heritage "Business Management of Stonehenge." Accessed May 17, 2014. http://www.english-heritage.org.uk/content/imported-docs/education/business-management-stonehenge.pdf.

"English Heritage Appoints Waste Contractor for Stonehenge Visitor Centre." *Recycling and Waste World* (January 7, 2014): 1. Accessed May 17, 2014. http://www.recyclingwasteworld.co.uk/news/english-heritage-appoints-waste-contractor-stonehenge-visitor-centre.

Essential Edinburgh. "Trade Waste Initiative." Accessed June 27, 2014. http://www.essentialedinburgh.co.uk/projects/facilitation/trade-waste-initiative/.

Gainey, Graeme, Jack Gillon, and Murray Wilson. *The Old and New Towns of Edinburgh World Heritage Site Management Plan, 2011-2016*. Edinburgh: City of Edinburgh Council and Edinburgh World Heritage, 2010.

Glasdon. "Focus On Low Maintenance Litter Bin for City of Edinburgh Council." Accessed July 5, 2014. http://gil.glasdon.com/downloads/case_studies/Brunel_Neopolitan_Litter_Bins_City_of_Edinburgh_Council.pdf.

Hansen, P.G. and A.M. Jespersen. "Nudge and the Manipulation of Choice: A Framework for the Responsible Use of the Nudge Approach to Behaviour Change in Public Policy." *The European Journal of Risk Regulation* 1 (2013).

Harrogate Borough Council. *Heritage Management Guidance: Draft Supplementary Planning Document Adopted for Development Control Purposes*. Harrogate: Harrogate Borough Council, 2014.

Heritage Lottery Fund. *Reducing Environmental Impacts: Good-Practice Guide*. London: Heritage Lottery Fund, 2012.

_____. *Planning greener heritage projects.* London: Heritage Lottery Fund, 2009.

Historic Scotland. *Heart of Neolithic Orkney World Heritage Site Management Plan 2008-2013—Consultative Draft, Appendix E: Environmental Report*. Edinburgh: Historic Scotland, 2007.

_____. *Investigating Blackness Castle: Information for Teachers*. Edinburgh: Historic Scotland, no date.

_____. *Operational Policy Paper Number 2/06: Historic Scotland's Support for the Voluntary Sector*. Edinburgh: Historic Scotland, 2006.

Humes, Edward. *Garbology: Our Dirty Love Affair with Trash*. New York: Avery, 2013.

ICOMOS General Assembly. *Charter for the Conservation of Historic Towns and Urban Areas (The Washington Charter)*. Paris: ICOMOS, 1987.

ICOMOS International Training Committee. *Principles for Capacity Building through Education and Training in Safeguarding and Integrated Conservation of Cultural Heritage*. Paris: ICOMOS, 2013.

ICOMOS. "Thematic Workshop On Cultural Heritage and Climate Change." Workshop proceedings from 16th General Assembly and Scientific Symposium, Quebec, January 10, 2008.

John, Peter, et al. *Nudge, Nudge, Think, Think: Experimenting with Ways to Change Civic Behaviour*. London: Bloomsbury Academic, 2013.

Jura Consultants *Impact of Historic Environment Grant Investment*. Edinburgh: Historic Scotland, 2013.

Keep Britain Tidy. *Litter-Making a Real Difference: How can we make the country cleaner?*. London: Keep Britain Tidy, 2013. Accessed June 17, 2014. http://www.keepbritaintidy.org/Documents/Files/Reseach/stakeholders_litter_report_FINAL_web.pdf.

_____. "Tell the Government How You Would Tackle Litter.." July 22, 2014. Accessed July 27, 2014. http://www.keepbritaintidy.org/tell-the-government-what-you-think-should-be-done-to-tackle-litter/2321/2/1/999/3.

Kruijsen, Joanneke. *Gaming for Sustainable Behaviour Change*. Aberdeen: Centre for Understanding Sustainable Practice, 2013.

Landmarks Preservation Advisory Board. Chautauqua Design Guidelines. Boulder: Department of Community Planning and Development, 1989.

Lewis, Allan, Polly Turton, and Thomas Sweetman. *Litterbugs: How to Deal with the Problem of Littering*. Policy Exchange: London, 2009.

Leya, M. et al. "Cultural Heritage and Waste Management: advanced techniques to preserving cultural heritage exploring *just in time* the ruins produced by disasters and natural calamities." In *Waste Management and the Environment,* edited by V. Popov et al. Vol. 5. WIT Transactions on Ecology and the Environment, 123-34. Southampton: WIT Press, 2010.

Litteraction. "The Ins and Outs of Litter and Fly tipping." Accessed May 15, 2014. http://www.litteraction.org.uk/images/new%20stuff/D1%20ins%20and%20outs,%20legal%20stuff.pdf.

Edinburgh World Heritage. "Managing the World Heritage Site." Accessed March 25. http://www.ewht.org.uk/managing-the-world-heritage-site.

Maclean, Alistair D. *Capitol Coalition Pledges-Delivery and Performance. Edinburgh: City of Edinburgh Council, 2012.* Accessed July 15, 2014. http://www.edinburgh.gov.uk/download/meetings/id/36183/item_81a_capital_coalition_pledges-delivery_and_performance.

Mundus, Bishop Design, Inc. Chautauqua Park Historic District: Cultural Landscape Assessment and Plan. Boulder: Colorado Chautauqua Association, 2004.

National Museums of Scotland. "Green Tourism Business Scheme." National Museums of Scotland. March 20, 2014. Accessed March 20, 2014. http://www.nms.ac.uk/about_us/about_us/green_tourism_scheme.aspx.

National Trust for Historic Preservation. "Adaptive Reuse." PreservationNation Blog. March 27, 2014. Accessed March 27, 2014. http://blog.preservationnation.org/adaptive-reuse/#.UzPH3K1_tOQ.

Natural Scotland. *Zero Waste Plan for Scotland: What does it mean for me?* Edinburgh: Scottish Government, 2010.

STV News. *"Litter in Edinburgh: Where Are the Worst Offenders?"* Accessed July 10, 2014. http://news.stv.tv/east-central/191569-litter-in-edinburgh-where-are-the-worst-offenders-data/.

Northeast Recycling. *Waste Reduction and Recycling Plan for Bath Heritage Days.* Bath, ME: Northeast Recycling, 2005.

Patel, Vilma, George Thompson, and Nick Wilson. "Cigarette Butt Littering in City Streets: A New Methodology for Studying and Results." *Tobacco Control* 22 (2013): 59-62.

Report On the IUCN-ICOMOC-ICCROM Monitoring Mission to the Robben Island World Heritage Site South Africa. Paris: UNESCO, 2004. Accessed July 30, 2014. http://whc.unesco.org/archive/2004/mis-916-0204.pdf.

Rizzo, Ilde, and Anna Mignosa, eds. *Handbook On the Economics of Cultural Heritage*. Cheltenham: Edward Elgar, 2013.

Roberts, John. "Garbage: The Black Sheep of the Family." Oklahoma Department of Environmental Quality. Accessed July 15, 2014. http://www.deq.state.ok.us/lpdnew/wastehistory/wastehistory.htm.

Rodemann, Katharyn. "Litter Did We Know." *Texas Monthly* (January, 2011): 111-15.

Rodríguez-Rodríguez, David. "Littering in Protected Areas: A Conservation and Management Challenge—a Case Study from the Autonomous Region of Madrid, Spain.." *Journal of Sustainable Tourism* 20, no. 7 (September 2012): 1011-24.

Roper, Stuart, and Cathy Parker. "The Rubbish of Marketing." *Marketing Management* 24, no. 9 (2008): 881-92.

Rustecki, Dominic. *The Big Green Society: Empowering Communities to Create Cleaner, Greener Neighbourhoods*. London: Localis, 2011.

Natural Scotland. *Zero Waste Plan for Scotland: What Does It Mean for Me?* Edinburgh: Scottish Government, 2010.

Scotland.gov.uk. "Tackling Scotland's Littering Problem." Accessed July 4, 2014.http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1/whodoeswhat/SharedResponsibilities/Litterandflytipping.

Scottish Government. *Our Place in Time: The Historic Environment Strategy for Scotland*. Edinburgh: Scottish Government, 2014.

_____. *Scotland's Third National Planning Framework*. Edinburgh: Scottish Government, 2014.

_____. *Scottish Historic Environment Policy*. Edinburgh: Scottish Government, 2011.

_____. *SPP 23: Planning and the Historic Environment*. Edinburgh: Scottish Government, 2008.

_____. *Scottish Planning Policy*. Edinburgh: Scottish Government, 2014.

_____. *Towards A Litter-Free Scotland: A Strategic Approach To Higher Quality Local Environments*. Edinburgh: Scottish Government, 2014.

The National Trust for Scotland. *St. Kilda World Heritage Site Management Plan, 2012-2017*. Edinburgh: The National Trust for Scotland, 2012.

Thompson, Michael. *Rubbish Theory: The Creation and Destruction of Value*. Oxford: Oxford University Press, 1979.

Townscape Heritage Research Unit, Department of Planning, Oxford Brookes University. *Townscape Heritage Initiative Schemes Evaluation: Ten Year Review Report*. London: Heritage Lottery Fund, 2013.

UNESCO World Heritage Centre and ICCROM. *World Heritage Papers 10: Monitoring World Heritage*. Paris: UNESCO, 2004.

UNESCO World Heritage Convention, World Heritage Committee. Budapest Declaration on World Heritage. Accessed July 21, 2014. http://whc.unesco.org/en/decisions/1217/

URBACT. *Tool Kit for World Heritage Monitoring Indicators*. Brussels: URBACT/European Union, 2006. Accessed July 21, 2014. urbact.eu/.../Tool_kit_for_World_Heritage_Site_monitoring_indicators.pdf.

Vail, Martha. *National Landmark Nomination: Colorado Chautauqua*. Washington, DC: National Park Service, Department of the Interior, 2005.

Wicherts, Jelte M., and Marjam Baker. "Broken Windows, Mediocre Methods, and Substandard Statistics." *Group Processes and Intergroup Relations* 17, no. 3 (2014): 388-403.

Wilson, James Q., and George Kelling. "Broken Windows." *The Atlantic*, March, 1982.

Young, Christopher, Amanda Chadburn, and Isabelle Bedu. *Stonehenge World Heritage Site Management Plan*. London: English Heritage, 2009.