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Methodological and Ideological Options

Re-framing the urban blight problem with trans-disciplinary insights from ecological economics

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ABSTRACT

Similar to circumstances in the field of economics, market fundamentalism dominates urban blight policy spaces in the U.S. despite criticisms of the paradigm. Unlike the unified alternative that ecological economics (EE) provides to conventional economic theory, however, disagreement over the meaning of "blight" has prevented a commonly held pre-analytic vision and policy agenda from forming in critical blight scholarship. This paper asserts that "applied EE" offers a framework in which to develop such a vision, and to strengthen the inchoate critical blight policy stream. We draw on the EE theory and concepts to argue that blight can be understood as a stock that accumulates in an urban system as a result of underinvestment into real property. Our conceptualization of the problem has several important implications for public policy. A brief illustration compares the relative efficacy of one city's characteristically neoliberal blight policies with more "EE-consistent" policies in a second city to show that the latter might in fact outperform the former.

1. Introduction

What, if anything, can critical urban scholars in search of better blight policies learn from ecological economists? Likewise, what, if anything, can ecological economists attempting to influence economic and environmental policies gain from urban blight researchers? At the outset these seem like odd questions to ask. The two fields are ostensibly unrelated in subject matter, scope, and, as ecological economists ought to appreciate, scale. For example, the overarching goal of a steady-state economy is surely more complex, interdependent, and macroscopic in nature than the goal of a blight-free city. Additionally, the former goal necessitates finding ways to balance global collective socioeconomic activities against the objective properties of the physical systems that sustain and contain the world economy; whereas the latter, insofar as blight tends to be a subjective concept, requires coordinating local collective decision-making in ways that satisfy the heterogeneous preferences of a given city's residents. Hence the challenges confronting each end are highly incongruent.

Nevertheless, it is claimed here that where the two diverse areas of research potentially share swaths of common ground is in their erstwhile limited capacities to facilitate enaction of public policies based on pre-analytic visions that are markedly different from each field's respective "conventional" approach. Consider first the case of ecological economics (EE). Despite its well-established foundations and growing popularity in academia (Costanza et al., 2004), the trans-discipline is largely absent from the American policymaking arena (Farley et al., 2007). Indeed, U.S. public policies are crafted predominantly within a market fundamentalist political discourse that emanates from the neoclassical economic paradigm (Boezeman et al., 2010). As a result, American economic and environmental policies are geared toward the market-based goal of efficient allocation, while essentially overlooking the primary and secondary EE policy goals of sustainable scale and just distribution (Farley et al., 2007).

Farley et al. (2007) suggest that this "failure" of EE to break through the U.S. policymaking glass stems not from having the wrong (or wrongly prioritized) policy goals relative to the citizenry, but from a meaningful disconnect between how those goals are communicated scientifically and politically. The source of the disconnect can be spelled out using Kingdon's (1995) policy window framework, in which problem, policy, and political streams are said to converge and "open the window" for policy change. Expressly, elected officials recognize mismatches between ideal conditions and the status quo by interpreting indicators, focusing events, and feedbacks from society. Informed actors then advocate for their favored solutions to these problems within "policy communities". The mood of the electorate, election results, and efforts of interested parties then codetermine which problems are most important, and feasible, with respect to the incumbent political landscape. The political stream then translates the most effectively articulated and politico-temporally relevant proposals into policies (Kingdon, 1995).

In this context, Farley et al. (2007) observe that the current of the EE political stream lacks sufficient strength to meet its relatively more forceful policy and problem counterparts at a confluence to open a policy window. Stated in a plainer language, although EE is grounded in sound science, which, in turn, enables its adherents to understand

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problems and prescribe policy solutions, ecological economists have so far en masse lacked the political capital and dexterity needed to turn problems into debates on legislative floors, goals into agenda items, and ideas into regulations. For all intents and purposes, the reach of the trans-discipline has yet to cross into the art of political communication.

Now take the case of critical urban studies as the body of research relates to blight. In spite of scholarly criticisms to neoliberal urban policy instruments in general (Brenner and Theodore, 2002), and critiques of neoliberal urban blight strategies in particular (Swyngedouw et al., 2002), market fundamentalism is the ruling paradigm in the blight policy spaces of most U.S. cities (e.g., Weber, 2002). Specifically, strategies such as "massive demolition programs…and subsidized developments" are celebrated for their alleged abilities to catalyze private neighborhood reinvestment (Accordino and Johnson, 2000). Large-scale urban redevelopment projects are believed to produce trickle-down economic effects in their proximate city geographies through raising property values and increasing esthetic appeal, and these effects are thought to incentivize neighboring stakeholders to correct local blight problems—"a rising tide lifts all boats", as it were (Teaford, 2000).

Contrary to this trickle-down narrative, Swyngedouw et al. (2002) observe that large-scale redevelopment projects tend to be "self-contained, isolated, and disconnected from the general dynamics of the city". In other words, they are rarely the blight solutions that they are purported to be. Given this line of criticism, what is, as EE is to neoclassical economics, the alternative?

At present there is no clear policy agenda held in common in the blight literature, and there is even murkier agreement over the definition of the phenomenon writ large. Blight remains a subjective and contested concept in the social and policy sciences (e.g., Breger, 1967; Brown, 2004). Because urban scholars do not subscribe to a shared vision or have common policy goals, as do ecological economists, a hampered blight policy stream has been outpaced by comparatively strong problem and political streams. Specifically, an eager political stream armed with ample blight funding from federal programs (e.g., the Community Development Block Grant in the U.S.), where programs exist because the problem stream of blight is well-known even if the phenomenon itself is not defined (Gordon, 2004), rely on the market-based practices ingrained in their institutions (e.g., Weber, 2002). The outcomes of anti-blight policies under these circumstances frequently involve piecemeal patterns of redevelopment (Gordon, 2008), political rent-seeking, and "public giveaways" (Weber, 2002).

The present paper is directed toward filling this gap in the critical blight policy stream with insights from applied EE. Our approach is to first propose an objective and replicable way to conceptualize "blight" in public policy discourses. We argue that having a consistent way to operationally define blight can help to minimize the problems associated with subjective blight declarations and political rent-seeking (Gordon, 2004). We then "apply" EE to the urban blight problem using tenets from the field to develop a decidedly contrasting view of blight management relative to the conventional approach. Next, we briefly examine blight dynamics in two cities. The first city's understanding of blight is interpreted as characteristically neoliberal, while the second's is more closely aligned with our EE vision. Although we eschew direct quantitative comparisons because of the two cities' highly divergent histories and present circumstances, descriptive measures suggest that EE-inspired blight management likely has superior qualities relative to conventional neoliberal strategies.

The article concludes by claiming that recasting the urban blight problem within an applied EE framework is but one example of how EE researchers can begin to increase the presence of the trans-discipline in political discourses. Particularly, while EE has not yet gained a permanent place in U.S. policymaking spaces (Farley et al., 2007), developments in applied EE can become powerful sources of symbols, synecdoche, metaphors, and analogies capable of bolstering the trans-discipline's political stream (Stone, 2002).

2. An "Ecological" Vision of Urban Blight

Prior to applying EE to the problem of urban blight, it is necessary to explicate the contested nature of the concept, and to discuss why that contestation makes blight an appropriate topic for this study. As it stands, having many differentiated, multidisciplinary interpretations of "blight" results in the problem being difficult to consistently quantify, empirically analyze, or efficiently govern. Local gaming of federal anti-blight funding programs for political ends, in the name of "blight", tends to be the rule rather than the exception in practice (Gordon, 2004; Weber, 2002). It is therefore unsurprising that elected officials generally seem to prefer an ambiguous blight concept (Gordon, 2008). Yet where social science research often steps in to resolve such ambiguities, most urban scholars maintain that blight is a subjective idea held in the minds of local stakeholders, and it is merely a reflection of larger, more complex structural societal problems (Shlay and Whitman, 2006). Accordingly, despite recognition that subjective blight declarations can have disastrous policy outcomes in practice (Weber, 2002), the willful absence of an objective conceptualization in the literature may weaken the problem's policy stream. To resolve this issue it is useful to fuse together the key areas of disagreement over the blight concept.

First, some researchers see blight as physical conditions–trash accumulation, boarded-up houses, broken windows, vacant structures, and overgrown lawns–that independently or collectively signal negative qualitative change in a given area (e.g., Krumm and Vaughan, 1976), and which tend to result from deferred urban property maintenance (Brueckner and Helsley, 2011). Other scholars view the phenomenon as the stage in, or a symptom of, the process of urban decline, such that it is more part of a structural problem than a set of conditions (Breger, 1967). Still others, particularly legal scholars, observe that "blight" in reality is a powerful policy and rhetorical device that legally authorizes local governments to fund or subsidize private economic development simply by declaring properties to be "blighted" (Brown, 2004; Eagle, 2007; Gold and Sagalyn, 2011; Pritchett, 2003). This fact places blight in a desperate need of the type of reconceptualization proposed here. That "blight declarations" in this sense allow municipalities to acquire and expend real property and public dollars at will reasonably generates demand for a problem definition that discourages or minimizes rent-seeking behavior among city officials (Brown, 2004).

To meet that demand, we turn to a classic portrayal of the problem. In an influential attempt to demuddle the blight literature, Breger (1967) identifies three "elements that unify the blight concept": (1) nonacceptance; (2) real property; and (3) depreciation. Without question, these elements continue to permeate blight theory (Gordon, 2004; Hartshorn, 1971; Krumm and Vaughan, 1976; Shlay and Whitman, 2006) and practice (Robinson and Cole, 2007). First, property is tendentially recognized as the carrier of the blight disease. The literature suggests that blight results from "deficient reinvestment" into urban property (Brueckner and Helsley, 2011), meaning that it is real property which becomes "blighted" or is declared so by municipal officials. This view is reinforced in public policy, where, according to a recent national analysis of U.S. state-level blight statutes, all fifty states and the District of Columbia have blight legislation that incorporates property to some degree (Robinson and Cole, 2007). Second, depreciation is the transformative process by which property advances from an earlier [pre-deficient reinvestment], "acceptable" state of nature to one that is "unacceptable". This transition, which concerns Breger's third element, fuels the dispute over blight. When is a property "acceptable" or "unacceptable"? In other words, what constitutes "deficient reinvestment"?

While there is no consensus answer to this question, for operational purposes we argue that one can effectively equate nonacceptance with noncompliance. The Tiebout (1956) model of community selection postulates that prior to location decisions, individual households assay the bundles of public goods and regulations in each of a large number of autonomous, heterogeneous communities. Based on individual valuation processes, households then optimize location decisions by choosing to reside in communities determined to have the sets of public institutions most in line with their preferences. This implies that households, by virtue of their location decisions, tacitly accept or consent to the regulations institutionalized in their given communities. Were that not the case, households would rationally relocate to places with more preferred institutional bundles (Tiebout, 1956). Hence a simplifying assumption can be made that what is allowable by municipal law is acceptable to municipal residents; and what is prohibited under municipal law is unacceptable to residents. From this proposition one can infer that real property attributes which are noncompliant with municipal laws are therefore unacceptable to the citizens of the municipality.

In this regard we operationalize blight as violations of real property codes, which are ever-present institutions in urban America (Ross, 1996). One critique that can be applied to any attempt to quantify a complicated social problem in this way is that quantification necessarily reduces real world complexity (Wilson, 2011). Accordingly, representing blight, which is generally seen as a multifaceted problem that both reflects and is a reflection of larger urban structural issues (Grigsby et al., 1987), as a single, discrete event might be difficult to accept at first. However, to paraphrase Wilson (2011), one cannot understand what one cannot measure. Indeed, our suggested use of property violations as a proxy for blight is not unlike Wilson's (2011) own use of holiday decorations to proxy for prosociality—it is founded on a theoretical understanding of the problem (Breger, 1967), and it does not preclude or disavow the complex relationships between the phenomenon and its urban environment. To wit, applied EE will allow us to link our discrete view of blight to the many multidimensional portrayals of the problem that transcend the literature. To facilitate the creation of such a link, the next section introduces a few important concepts from EE. Those concepts are subsequently applied to the urban real property system to develop a new pre-analytic vision for blight management.

2.1. Insights from EE

In conventional economics, the economy is viewed as a whole rather than as part of a larger system (Daly and Farley, 2004). Economic growth is broadly defined as the expansion of an economy's output (Common and Stagl, 2005), and it is presumed that growth in output can persist indefinitely (Rees, 2003). This is because the economy and environment are separate, independent, open systems that exchange with, rather than encroach on, one another.[1] Rees (2003) labels this view the "expansionist paradigm". An essential ingredient of the expansionist paradigm is that economic agents can extract raw materials from and return wastes to the environment freely; for, more growth will lead to more wealth, and more wealth will inexorably lead to higher demand for a clean and healthy environment (Rees, 2003). Consequently, the expansionist paradigm predicts that environmental damage resulting from unrestricted economic growth will, if benefits exceed costs, be corrected by transferring rising wealth from the economy back into the separate environmental system.

Ecological economists disagree fundamentally with the expansionist worldview (Daly and Farley, 2004). Contra the assumption that the economy and environment are independent systems, the EE theory observes that the economy is a subsystem, or part, of the environmental system. Under this view, the economy is constrained by the size of the environment (Daly, 1992). Hence irreversible environmental damage–i.e., damage that is not correctable through inter-system wealth exchanges–is not only possible under persistent economic growth. But if growth is such that raw material extraction and pollution exceed the environment's capacities for resource regeneration and waste assimilation, then such an outcome is expected (Rees, 2003).

[1] See Voinov (2008) for detailed treatments of the systems science concepts found in this section.

This EE prediction is driven precisely by the notion that the economy is embedded within the Earth system, which is [for all intents and purposes] materially closed (Daly and Farley, 2004). Stated differently, while the Earth system exchanges heat and energy with the outside universe, raw materials do not enter or exit. Because the Earth system is practically closed, then, its abilities to produce resources for, and assimilate wastes and pollution from, economic processes are limited by physical properties. Perhaps above all else, the economy is subject to the First and Second Laws of Thermodynamics (Common and Stagl, 2005).

2.1.1. The First and Second Laws of Thermodynamics

The First and Second Laws of Thermodynamics describe physical properties of the quantity and quality of matter and energy (Georgescu-Roegen, 1975). The First Law (F-LOT) states that neither matter nor energy can be created or destroyed (Daly and Farley, 2004). The implication for economic activity is that what comes out must go in—i.e., when raw materials are "used up" in the economy, the matter and energy from economic activities are quantitatively conserved (Common and Stagl, 2005). Thus what is extracted from the enclosing environmental system for economic production is returned to it following consumption.

The Second Law of Thermodynamics (S-LOT) concerns how this flow of raw materials from the environment to the economy and back qualitatively impacts the containing system. In thermodynamics entropy is defined as the degree of "used-up-ness" of raw materials (Daly and Farley, 2004), or the stock of unusable resources in a system. It is a measure of the disorder created by the flow of raw materials from the environment as a resource, back to the environment as a waste or pollutant. Usable raw materials are classified as low entropy, or relatively orderly. Wastes and pollutants are classified as high entropy. In this regard, S-LOT states that the entropy in a differentiated system never decreases, or never goes from high to low (Rees, 2003). Within the context of F-LOT, S-LOT implies that "although matter and energy are constant in quantity, they change in quality" (Daly and Farley, 2004). The quality indicator is entropy, and by S-LOT matter and energy in a given system tend toward a lesser quality, or higher entropy.

2.2. Applied EE and Urban Real Property

The foregoing discussion allows for a useful analogy to the urban real property system. Much like the relationship between the economy and the environment in neoclassical economics, conventional urban political and economic views are such that a "rising tide will lift all boats" in a declining city (Teaford, 2000). To be precise, what is denoted here as the "urban expansionist" paradigm presumes that neoliberal urban development policies such as "massive demolition programs, public improvements, and subsidized [projects]…will stimulate [private] reinvestment in a neighborhood" (Accordino and Johnson, 2000). Under this worldview, blight, like pollution in neoclassical economics, can be corrected by increasing economic wealth. If benefits exceed costs, large-scale developments will propagate private local property investments and, ultimately, blight problems will be fixed.

Counter to the expansionist outlook, the "urban ecological" paradigm proffered here views real property as embedded within the larger urban system. Hence, the resources available to it are qualitatively and quantitatively constrained by the set of extant institutions within the urban system. Whereas environmental resources include raw materials, urban institutional resources include inter alia land, real property regulations, private commercial investment, public expenditures, and the degree to which urban dwellers make coordinated property maintenance decisions. With respect to the latter of these, if individual property owners fail to collectively maintain their properties at the compliant level, then the "urban ecological" paradigm predicts that blight, in the context of this research, will occur.

This is the same type of prediction that EE theory makes with respect to pollution in the face of unencumbered economic growth. Because the economy is a subsystem of the environment, it is therefore subject to the physical laws that govern the closed Earth system. So long as resource extraction and waste generation are practiced sustainably and in accordance with these laws, economic agents can continue to produce and consume without overly detrimental environmental consequences (Daly and Farley, 2004). Much the same, because real property is a subsystem of the larger urban system, it is necessarily subordinate to the rules thereof. If property-owning agents do not violate these rules, production and consumption of real property services can go on without increasing blight.

In a continuation of the EE analogy, then, two "Laws of Urban Dynamics" that govern urban spaces are proposed below. It is implied that urban public policy and/or private investment can be redirected in ways that make real property usage sustainable relative to these laws, meaning that it is not necessarily urban destiny for cities to move unidirectionally toward ever-increasing levels of blight.

2.2.1. The Laws of Urban Dynamics

2.2.1.1. The First Law of Urban Dynamics (F-LOUD). In a given urban system, real property is neither isolated in space nor constant in condition.

"No parcel of land is an island unto itself" (Platt, 2004). Real property usage incontrovertibly generates externalities. F-LOUD combines this fact with the observation that real property quality, like human health, tends to deteriorate over time (Bourne, 1981). Maintenance and investment are needed in order to retain real property at a certain level of quality (Grigsby et al., 1987). If one assumes that the socially optimal level of real property quality is that which is compliant with local regulations, then any household that fails to maintain compliant property generates a negative externality in the form of blight. Bourne (1981) shows that negative externalities from insufficient maintenance are spatially linked, such that localized prisoner's dilemma situations precipitate the spread of blight throughout a neighborhood in which violations accumulate. That blight arises from individual inactions and coordination failures leads to the next "law".

2.2.1.2. The Second Law of Urban Dynamics (S-LOUD). Blight in a given urban system is never naturally decreasing.

S-LOUD is a logical consequence of joining the premises of F-LOUD with the discussion of blight elements presented earlier. Real property decreases in quality relative to regulatory standards as a result of aging, weatherization, and other natural forces. Eventually qualitative reductions without adequate maintenance or low-impact use will render properties noncompliant with regulations. If owners do not maintain properties at the compliant level, then there is a coordination failure which creates blight and imposes costs on neighboring property owners (Bourne, 1981). In this sense, the stock of blight in an urban system is dependent on individual decision-makers—blight is not naturally self-reductive.

Given the rules and relationships just outlined, an "Urban Ecological Real Property" framework is put forward to organize the discussions from above into a unifying anatomy of blight, and to examine its implications for public policy.

2.3. The Urban Ecological Real Property ("UERP") Framework

Recall from EE that low entropy (usable) raw materials flow from the environment, through the economy for production and consumption, and back into the environment as high entropy (unusable) wastes and pollution. This flow is referred to as throughput. Throughput in the economy has two ends: (1) depletion of an environmental source or (2) pollution of an environmental sink (Daly and Farley, 2004). Throughput decreases the usable stock of a resource and/or negatively impacts the productivity of the environment. Recycling materials can counterpoise throughput, but not at a one-to-one rate (Daly and Farley, 2004). In conjunction with F-LOT, these observations lead to the S-LOT conclusion that entropy in a differentiated system is never decreasing. Using the language just introduced, entropy is therefore the accumulated throughput in the environmental system.

Following this logic, and to complete the EE analogy to the urban real property system, the UERP framework posits that blight is equal to entropy in the urban system generated by activities from within the real property subsystem. Blight is thus the accumulation of real property throughput, where throughput is noncompliance or "used-up-ness" (Daly and Farley, 2004) per unit time. As above, throughput in this framework has two ends: (1) depletion of the low entropy or compliant stock of property; and (2) pollution of the enclosing urban system. "Recycling" in the form of repair and demolition can counteract throughput by bringing properties into compliance or eradicating them from the urban landscape, respectively. But to wholly offset throughput for a given unit of time it is necessary for all properties to be maintained at the compliant level during that interval, or for an equal proportion of properties to flow from compliance to noncompliance and vice versa. If these conditions are not satisfied, then the conclusion of S-LOUD will apply. Namely, blight in the system will not decrease.

This framework is presented graphically in Fig. 1. The outer boundary represents the urban system. Within the urban system is a real property subsystem inside which usage and maintenance decisions are made.

Keep in mind that the goal of the UERP is not to present a comprehensive system view of urban society, nor is it to model cities as systems. For that type of work readers are referred to Allen (1997) and Batty (2005). The purpose here is to fundamentally re-conceptualize blight in a way that strengthens the problem's critical policy stream and minimizes opportunities for subjective policies and political rent-seeking in practice (e.g., Gordon, 2004). In pursuit of this end, our research adopts a trans-disciplinary approach which embraces the logical tools of EE and systems science while eschewing mathematical modeling. The focus here is on relationships and how those relationships can be most parsimoniously understood for governance and research. That said the inter-relationships of the elements from Fig. 1 and their accompanying assumptions are discussed below. The most general observations start with the outer urban system boundary.

2.3.1. The Containing Urban System

The UERP assumes that urban systems are comprised of institutions and resources. Ostrom (2005) defines institutions as "the prescriptions that humans use to organize all forms of repetitive and structured interactions". Urban institutions thus include everything from formal laws and regulations to informal cultural responses to social situations. Some key institutions of the urban system are (1) public policies, including real property regulations, (2) collective decision-making, (3) social norms and conventions, and (4) criminal laws. The resources or "raw materials" that are central to the UERP are (5) public expenditures, (6) private investment, and (7) land. Together these elements interact with the real property subsystem to create and manage blight. Real property regulations are the parameters of blight. The absence of collective or coordinated decision-making with respect to property maintenance precipitates blight. As will be expounded shortly, social norms and conventions and criminal laws are potentially polluted by blight. Public policies, public expenditures, and private economic investments are used to recycle and manage blight. And land is the resource on which real property exists and becomes subject to blight.

Dashed arrows initiating outside of the urban system boundary indicate that resources and institutions are partially shaped by forces not immediately contained within the urban system. For example, local public expenditures and policies are often only made possible by state and federal authorizing legislation. The multiple arrows moving outward from the "Institutions" and "Resources" labels in the urban system

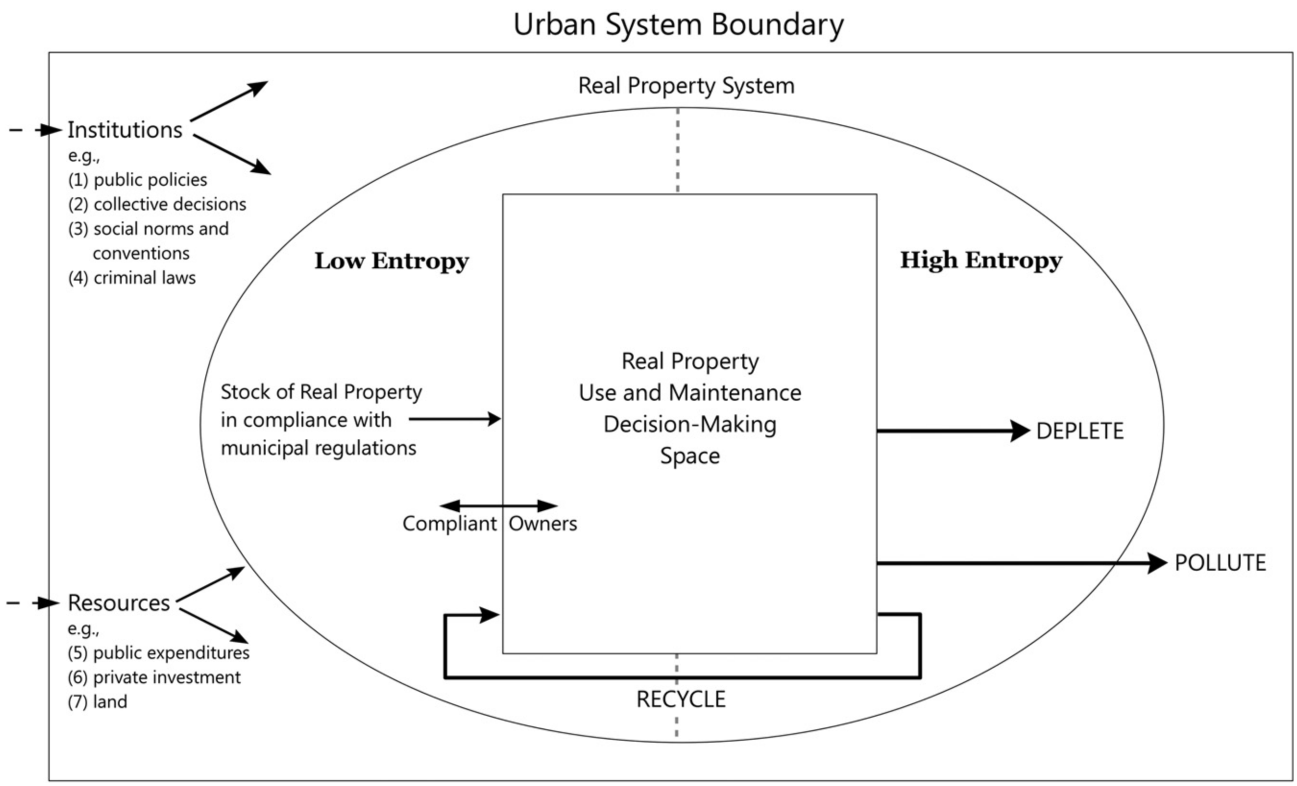

Fig. 1. The UERP framework.

convey that these elements serve as inputs to all urban subsystems. For simplicity, though, external systems and complementary urban subsystems are abstracted from so as to focus exclusively on real property.

2.3.2. The Entropic Real Property Subsystem

The elliptical shape in Fig. 1 represents the real property subsystem embedded within the urban system. The area of the ellipse constitutes the total set of real property in a city, where real property is the "physical land, buildings, [and] vegetation…pertaining to specific tracts of land" (Platt, 2004). Within the ellipse is a real property decision space, inside which choices are made by individual parcel owners among alternative property uses and maintenance strategies.

The interior of the ellipse is arranged to produce the appearance of a temporal progression. One intellection of entropy is as "time's arrow", or the "tendency of systems to evolve toward…high entropy" (Carroll, 2008). In other words, systems naturally become less ordered. This proclivity is palpable in the urban real property subsystem. As F-LOUD and S-LOUD import, real property bears a natural predisposition toward blight. Blight is only prevented or abated by the intervening actions of human agents. Hence the rectangular real property decision space is central both graphically and practically. In the absence of socially optimal maintenance decisions, property temporally advances to states of high entropy, or blight. This is illustrated in Fig. 1, where property begins in a compliant state of nature on the low entropy or left hand side of the real property ellipse. It then becomes an input to the real property decision space, where owners extract use and value therefrom. Owners who maintain properties at compliant levels do not positively contribute to throughput, and thus compliant properties do not exit the decision and use space into the right hand side of the ellipse. For other types of owners, however, this "used-up-ness" or throughput has three ends in the urban system—two of which are natural and the third requires human interposition.

2.3.3. The Ends of Throughput

Throughput in the UERP is defined as the flow of real property from compliance to noncompliance. The three ends of throughput are represented by the three arrows emanating from the right side of the real property decision space in Fig. 1. First, absent adequate maintenance, real property necessarily decreases in quality over time due to aging weatherization, and other natural processes (Grigsby et al., 1987). In this sense, any time deteriorating property conditions become noncompliant with local regulations, the stock of low entropy, compliant property is decreasing. This follows from the basic observation that compliance and noncompliance are mutually exclusive events, and nothing can simultaneously exist in mutually exclusive states of nature. Consequently, if property is not sufficiently maintained to offset these natural tendencies for its quality to decline, throughput will deplete the source of low entropy real property.

The second end of throughput, pollution, requires some critical thinking. In this research blight is conceptualized as the accumulation of regulatory noncompliant real property within the urban system. It was noted above that one possible limitation of this description is that it does not incorporate some of the common social problems that are frequently associated with blight in the literature. For example, graffiti and vacancy are often branded as blight, or, together with blight, as symptoms of larger social problems (e.g., Krumm and Vaughan, 1976); yet if graffiti is a violation of criminal, and not real property, regulations, then the UERP does not consider it to be blight per se. Furthermore, if chronically vacant structures are otherwise in compliance with real property regulations, then the UERP similarly excludes them from its vision of blight.

Here it is claimed that the pollution end of throughput from Fig. 1 is the bridge between blight and what can operationally be thought of as "blight correlates". Pollution in the UERP is a panoptic idea in that it allows blight to feedback into the larger urban system. Ross and Mirowsky (1999) note that "cared-for and well-maintained buildings most purely indicate [the absence of]…decay". By contrast, noncompliant or decayed properties signal a breakdown in social institutions (Ross and Mirowsky, 1999). Recall that the key institutions from the urban system include collective decision-making, social norms and conventions, and criminal laws. If visible blight in the form of decayed properties contributes to the erosion of these institutions, then it can eventually lead to criminal activities (e.g., graffiti), additional coordinated decision-making failures (e.g., long-term vacancy), or other social tensions (e.g., Skogan, 1990; Wilson and Kelling, 1982). Hence, despite having narrowly defined blight for analytical purposes, the pollution end of throughput in the UERP conceptually reconnects the phenomenon to the multiplicity of variegated social institutional breakdowns that are inconsistently called "blight" in different corners of the literature.

Lastly, strictly speaking recycling is not an organic "end" of throughput. Recycling means that human intervention must take place to restore noncompliant property to compliance, which implies that high entropy real property is not naturally regenerative. That is, real property can only be recycled back into compliant low entropy stock by decision-making agents who choose to engage in repair or demolition. The former action involves bringing property conditions back into compliance with regulations through rehabilitation, and the latter involves removing noncompliant properties from the urban landscape through razing and land-clearing. It is often the case that neoliberal urban blight policy operates at this "end", intervening in the real property subsystem to convert noncompliant stock into developable land or retrofitting it for large-scale development. While redeveloping targeted areas in this manner certainly increases the recycling outflow from Fig. 1 during one or a few time periods, the tactic is unsuccessful at connecting with the "general dynamics of the city" (Swyngedouw et al., 2002). Thus it is reasonable that large-scale developments insubstantially reduce the level of blight in cities, as they do not directly curb the inflow–a critical leverage point–to the stock. This intuitive UERP prediction coheres well with the existing literature (e.g., Swyngedouw et al., 2002; Weber, 2002), and it also portends that a single policy instrument, economic redevelopment, is unlikely to unilaterally satisfy the independent objectives of decreasing noncompliance per unit time and catalyzing blight outflows.

2.3.4. Recap

To summarize, the phenomenon of blight lacks consistent representation in urban studies (Shlay and Whitman, 2006). In a fusion of blight literature and EE theory, the UERP offers an alternative pre-analytic vision of the origins and dynamics of blight in cities, and it proposes a replicable way to represent blight in public policy discourses. It is therefore an initial step toward calibrating urban social science research and policy with information necessary to strengthen the critical blight policy stream. We submit that a discrete operational view of blight can help to eliminate the political rent-seeking behaviors which are currently possible, and typical (Gordon, 2004), given the extant practices of (1) funding efforts to reduce "blight" with public dollars while simultaneously (2) allowing elected officials to subjectively define the parameters of the problem. Recasting the blight problem within an applied EE framework highlights key leverage points for consistent policy interventions, such as curbing real property throughput (e.g., reducing the flow of noncompliance per unit time). To demonstrate how this vision might apply in the real world, the next section briefly examines blight, as conceptualized in the UERP, for two cities over the same time period—one whose policies originate in the conventional neoliberal paradigm; and one whose approach resembles an applied EE strategy of throughput minimization.

3. Applied EE in Practice

Even though market-based approaches dominate contemporary blight policies in U.S. cities, there are a few recent examples of innovative, "bottom-up" approaches that have resulted in some success (e.g., Shlay and Whitman, 2006). One set of policies that deserves particular attention for its relevance to the applied EE UERP framework comes from Tacoma, WA. Enacted in 1995, the Tacoma CARES (Cleanup And Revitalization Efforts) program is a citywide approach to blight management that jointly endeavors to (1) decrease the inflow of blight, (2) increase its outflow, and (3) minimize opportunities for the phenomenon to "pollute" the urban system (refer to Fig. 1). A non-exhaustive overview of the policies' strategic elements is presented in Table 1.

What is perhaps most striking about CARES is its ability to quickly change individual-level behavior within the real property decision and use space (Fig. 1). For instance, a strict "nuisance code" swiftly engages city resources after a property is cited for anything from visible trash, debris, and overgrown lawns to dilapidated [exterior] structural issues, broken windows, and peeling paint. If a property owner fails to correct violations within a certain number of days from the citation, the city deploys a crew to fix the problem. Subsequently, the property owner is billed for the services (City of Tacoma, 2012b).

From the time this rapid response tactic was first implemented in January 2007 through mid-2012, only 3% of violations required the services of city crews. 97% of owners voluntarily "recycled" their noncompliant property back into compliance through rehabilitation (City of Tacoma, 2012a). In view of that, the policy has proven to be a convenient means of achieving macro-control without sacrificing micro-freedom. Noncompliant property owners are effectively given a menu of options from which to select a compliance strategy: correct the violations themselves, hire private contractors, or wait for the city to take action. Although all methods inexorably impose some cost on the property owner, individual violators can self-select into the most cost effective compliance alternative relative to their preferences.

Now compare the CARES program to the signature "5 in 5" demolition strategy of Buffalo, NY, which is described in Table 2 alongside a complementary but unrelated institution. The flagship blight removal plan in Buffalo involves increasing "recycling" (Fig. 1) through creative destruction—demolishing more blighted structures more quickly to open up land for higher valued uses (Silverman et al., 2012). This fits well into the market fundamentalist paradigm in which urban redevelopment produces trickle-down effects sufficient to incentivize nearby property code compliance.

Almost exclusive policy focus in Buffalo is therefore on increasing the publically-funded outflow of blight. Unlike in Tacoma, the Buffalo strategy seemingly lacks mechanisms to encourage voluntary "recycling" via

Table 1
Blight management in Tacoma, WA (Tacoma CARES).

Program	Description
"Blight Mobile"	Roving "Blight Mobile" assists residents with disposal of litter and debris collected from public right-of-ways.
Code Enforcement[a]	-Public Works Department enforces nuisances (litter, peeling paint, etc.), abandoned vehicles, minimum building and structure codes, graffiti, and overgrown vegetation. -Residents are provided with a dedicated nuisance code hotline to report violations, and are encouraged to do so. -Nuisance Code Fact Sheets are available to residents to educate them on violations. -City crews correct violations and bill property owners for services if owners do not bring properties into compliance in a timely manner.
Blighted Structures Program	Provides resources to low-income, elderly, and disabled residents whose properties are not compliant with city codes
Rebuilding Together	City, local businesses, community agencies, and community volunteers collaborate to rehabilitate 40 noncompliant homes per year.
Code Enforcement Training	-Trains individuals or neighborhood organizations in the basics of code enforcement -Suggests best practices for resolving code issues

[a] City's primary blight policy.

Table 2
Blight management in Buffalo, NY.

Program	Description
"5 in 5" Demolition Program[a]	Seeks to demolish 5000 vacant and "blighted" structures over five years
Code Enforcement	-Not affiliated with "5 in 5" -Inspections department enforces property code standards; -General hotline allow residents to report code violations, but it is not dedicated exclusively to property concerns; -City does not repair structures that remain noncompliant for extended periods of time; -Citations are issued and violations are sent to housing court; -Code enforcement training is not advertised, and presumably unavailable, for residents.

[a] City's primary blight policy.

Table 3
City housing stocks and code violations.

	Tacoma	Buffalo
Source: American Community Survey, 2005–2009		
Total housing units	87,635	145,587
% Vacant	9.2	19.4
% Built before 1939	26.0	66.6
Source: City Code Databases		
Outstanding violations on 6/30/09 (beginning with 0 on 10/1/99)	1996	20,820
Average length of violation (in quarter years from 10/99–6/09)	2.2	14.0

options from a menu of alternatives. Moreover, there is far less accountability when it comes to long-term property violations. Whereas with Tacoma's set of policies, violations are intended to be resolved within a matter of weeks, it is not uncommon for violations in Buffalo to remain outstanding for years on end (Table 3).

For Tacoma, then, blight is conceptualized as an issue of scale that results in accumulative harm. When property violations begin to spill-over and accumulate, the system-wide impacts can become devastating (Stone, 2002). Thus, the city has established several programs to curb the inflow of violations while engaging separate instruments to turn up the outflow. For Buffalo, on the other hand, blight is ostensibly a market-based problem with a market-based solution. If blight occurs, it is because the benefits of neglecting property maintenance outweigh the costs for some agents. Scale is irrelevant. Rather, the problem can be corrected by expending resources to open previously blighted areas through demolition for redevelopment. Development increases the benefit of local property maintenance, thereby providing the incentive for nearby owners to bring their holdings into compliance (Teaford, 2000).

To explore the practical implications of these vastly different strategic visions, we briefly plot property code violation data over time for each city. Tacoma maintains an online database with which any Internet user can query property code violations.[2] Buffalo utilizes a private Real Property Information System[3] that also features a code violation database. An information request made to the Buffalo Department of Management Information Systems resulted in a list of open property code violations[4] covering the time period from October 1999 through the end of June 2009. The Tacoma database was then queried for open property violations over the same time period, and violations for each city were totaled for quarter years (Jan–Mar, Apr–Jun, Jul–Sep, Oct–Dec).

Before plotting descriptive results from these queries, it is worth noting once more that direct numerical comparisons between the cities are avoided. The interest is merely in general (linear) trends. Buffalo is a relatively older city with a complex history of industrialization, growth, deindustrialization, and decline (Glaeser, 2007). Once a dominant hub of commerce (Glaeser, 2007), Buffalo's population has fallen by 55% since its peak census count in 1950. By contrast, the 2010 U.S. Census shows that Tacoma has experienced strictly positive population growth since 1870, though recent deindustrialization and decline have led to concerning blight and vacancy problems (Bjornson, 2008).

Nevertheless, the fact that Buffalo's infrastructure was built for a much larger population than it presently hosts predisposes it to higher vacancy rates, and, by extension, increased propensities for "deficient reinvestment" into real property, relative to Tacoma (Brueckner and Helsley, 2011). Table 3 supports this supposition with U.S. Census data. Compounding the issue of unequal levels of vacancy, Buffalo's older housing stock (Table 3) has presumably had more exposure to natural processes of aging and weatherization compared to Tacoma. At minimum these disparities suggest that the blight problem in Buffalo is likely to be worse than the corresponding problem in Tacoma. Therefore, for these reasons, and assuming that there are unobserved differences in the resources and institutions that operate on each city's respective real property system (Fig. 1), we do not attempt to control for explanatory factors and assess the causal effects of the cities' policies on urban blight. Nor do we wish to quantify the growth in violations for each city over the time series and compare the totals. Rather, we are interested simply in whether descriptive evidence can be produced in favor of the UERP prediction that cities whose anti-blight policies are consistent with throughput minimization will see less (flatter) growth in blight over time relative to cities adopting conventional, neoliberal redevelopment strategies. Such evidence can chart a course for future work in the area of blight policy. Thus we are concerned here with exploratory analysis to examine trends in the change in blight over time, and we encourage future confirmatory research to elucidate the causal effects of the different blight policies.

That being said, Fig. 2a and b plot the quarterly violation flows for Tacoma and Buffalo, respectively, where the "flow" of blight for each city is computed as:

$$\Delta\beta^C_{t,t-1} = \beta^C_t - \beta^C_{t-1} \tag{1}$$

and where β is the stock of blight (cumulated violations), t is the time period, and C denotes the given city, Buffalo or Tacoma. Linear least squares lines (depicted as thick, dark lines) are then fit through the two series of flow points to depict general trends in violation growth.

3.1. Observations

Recall that the Tacoma suite of policies was interpreted to have the principle objective of curbing blight inflow by quickly recycling noncompliant stock back into compliance. This is the equivalent of stating that Tacoma's policy goal in the UERP framework is throughput minimization (e.g., Daly and Farley, 2004). It should therefore be no surprise to ecological economists that the long-term trend in Tacoma's blight flow is flat (Fig. 2a). While violation flows experience

[2] See http://www.govme.org/govME2/cbs/k5notifications.aspx.

[3] See http://www.ci.buffalo.ny.us/Home/City_Departments/ManagementInformationSystems/SoftwareApplications.

[4] The information request was for all "violations opened" from the time the RPIS was implemented through the time of the request in 2010. The request fulfillment provided all violations with an "open" status for the given time period. It is unclear whether these data also represent all the violations that were opened during the time series. If they do not, it should be assumed that the query does not capture violations which were opened and closed within the time series, if such cases exist. Consequently, the "flow" and "stock" oscillations depicted for Buffalo in Figs. 2 and 3, respectively, might in actuality exhibit more peaks and valleys; nonetheless, the flows would still lie everywhere above 0 in Fig. 2, and the stock would lie everywhere above the Buffalo line pictured in Fig. 3. It was not possible to consider only "open" violations for Tacoma over the relevant time period, as no violations were open for the entire time series.

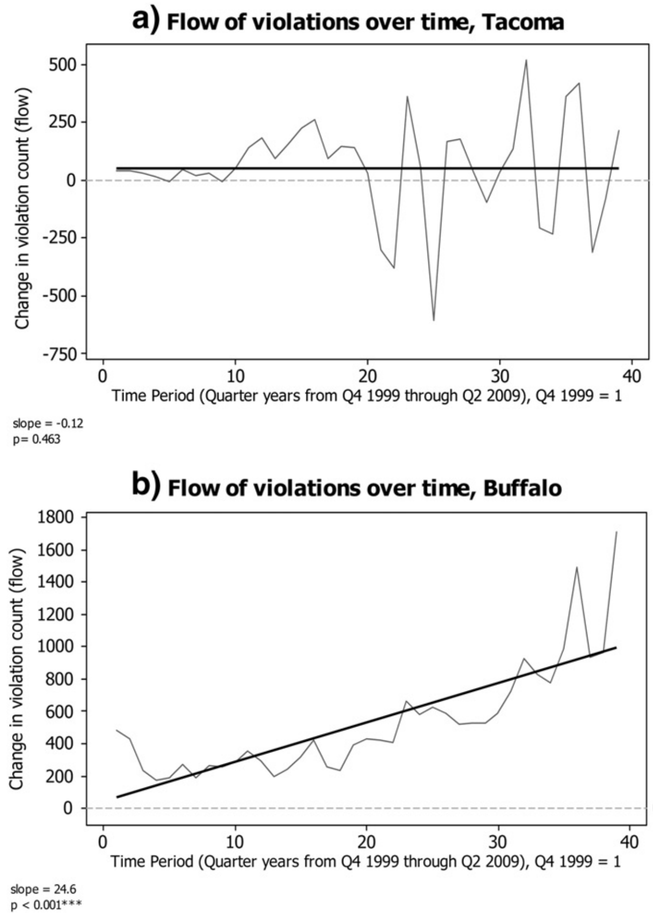

Fig. 2. a. Change in code violations in Tacoma, 10/1999–6/2009. b. Change in code violations in Buffalo, 10/1999–6/2009.

short-term up and down fluctuations, the throughput-minimizing policies tend to balance these oscillations over time.[5]

By contrast, the market-based approach in Buffalo shows a significantly positive trend in violation flows over time (Fig. 2b). Hence, lack of focus on the relative role of throughput potentially contributes to the city's blight problem. The anticipated trickle-down effects from opening land for development are either absent or insufficient to produce negative flows during any of the observed quarter year intervals.

While future research is needed to conduct sophisticated quantitative analyses that control for the socioeconomic and demographic differences between the two cities to make more direct comparisons and powerful inferences, for present purposes it is necessary only to look at the practical outcomes in each city with respect to the shared goal of blight reduction. Fig. 3 plots the stock of blight over time for each city. As is readily inferable from Fig. 2a and b, blight in Buffalo is uniformly increasing over the full time series, while cumulative violations in Tacoma eventually become somewhat stabilized. It is therefore reasonable to speculate that the throughput-minimizing policies of Tacoma are perhaps more efficacious at controlling the problem—an indication that the applied EE pre-analytic vision of the phenomenon might offer both a better understanding of the dynamic nature of blight relative to market fundamentalism, and a more expedient direction for public policy.

[5] The up-and-down fluctuations here seem to have a temporal pattern, with peaks occurring in early quarters and valleys in late quarters; however, the oscillations do not take away from the ultimate result that the overall trend in violation flows for Tacoma is flat—an indication that the throughput-minimizing policies of the CARES program are plausibly working as intended.

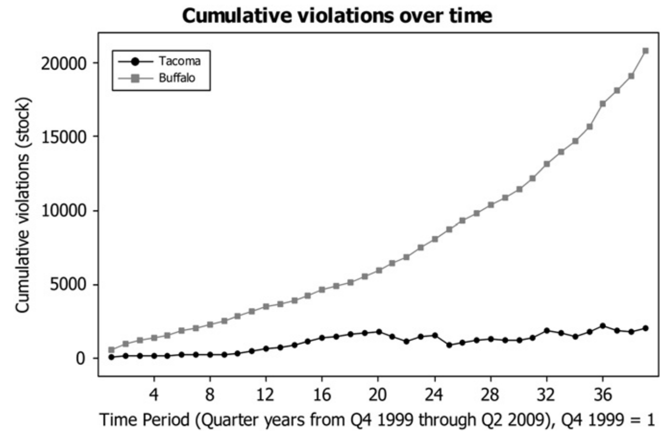

Fig. 3. Cumulative violations in Tacoma and Buffalo, by quarter year, 10/1999–6/2009.

4. Conclusions

In their closing remarks to a pivotal call for ecological economists to become more skilled "policy entrepreneurs", Farley et al. (2007) observe that "ecological economics…[is] too important to remain cloistered in academia". To this, the preceding exercises suggest that the logic and principles of EE likely stretch into more spaces than previously thought, including real world urban policymaking arenas far from the ivory tower.

Returning to the questions posed in the opening sentences, it has been shown that the problem and policy streams of EE are sturdy enough to support a branch of "applied EE" that transcends the trans-discipline's pursuit of a steady state economy. As an example, this research applies EE to the outwardly unrelated field of urban blight. The application is convenient for at least two reasons. First, as in economics, market fundamentalism dominates urban blight policy spaces in the U.S. despite many academic criticisms of the paradigm (Weber, 2002). Second, unlike the unified contrast that EE presents to market fundamentalism in the broader field of economics, disagreement over the nature of blight has prevented a commonly held pre-analytic vision and shared policy agenda from forming in critical blight scholarship (Gordon, 2008). This paper demonstrates that applied EE offers a sound framework in which to develop such a shared vision to strengthen the inchoate critical blight policy stream. Much the same, we argue that applied EE can become a laboratory for studying related policy issues in the urban social sciences. With the support of its applied branch, the larger EE political stream can slowly begin to erode away erstwhile embankments and meander into mainstream policymaking discourses.

References

Accordino, J., Johnson, G., 2000. Addressing the vacant and abandoned property problem. Journal of Urban Affairs 22 (3), 301–315.
Allen, P., 1997. Cities and Regions as Self-organizing Systems. Taylor & Francis, New York.
Batty, M., 2005. Cities and Complexity: Understanding Cities with Cellular Automata, Agent-based Models, and Fractals. The MIT Press, Cambridge.
Bjornson, E., 2008. The Tacoma armchair approach to cleaning up your neighborhood. The Tacoma Sun. (19 Feb. http://www.tacomasun.com/2008/02/19/tacoma-armchair-approach-to-cleaning-up-your-neighborhood/ (last accessed 30 May 2012)).
Boezeman, D., et al., 2010. The (limited) political influence of ecological economics: a case study on Dutch environmental policies. Ecological Economics 69, 1756–1764.
Bourne, L., 1981. The Geography of Housing. V.H. Winston & Sons, Toronto.
Breger, G., 1967. The concept and causes of urban blight. Land Economics 43 (4), 369–376.
Brenner, N., Theodore, N., 2002. Spaces of Neoliberalism: Urban Restructuring in North America and Western Europe. Blackwell, Oxford.
Brown, C., 2004. Blinded by blight: a search for a workable definition of "blight" in Ohio. University of Cincinnati Law Review 73, 207–233.
Brueckner, J., Helsley, R., 2011. Sprawl and blight. Paper Presented at the 46th Annual AREUEA Conference in Denver, USA, January.
Carroll, S., 2008. The cosmic origins of time's arrow. Scientific American 298 (6), 48–57.

City of Tacoma, WA, 2012a. Nuisance Code Fact Sheet. http://www.cityoftacoma.org/File.ashx?cid=6716 (accessed 30 May 2012).
City of Tacoma, WA, 2012b. Tacoma CARES. http://www.cityoftacoma.org/Page.aspx?nid=191 (accessed 30 May 2012).
Common, M., Stagl, S., 2005. Ecological Economics: An Introduction. Cambridge University Press, New York.
Costanza, R., et al., 2004. Influential publications in ecological economics: a citation analysis. Ecological Economics 50, 261–292.
Daly, H., 1992. The concept of a steady-state economy, In: Daly, H. (Ed.), Steady-state Economics, 2nd ed. Island Press, Washington, DC.
Daly, H., Farley, J., 2004. Ecological Economics: Principles and Applications. Island Press, Washington, DC.
Eagle, S., 2007. Does blight really justify condemnation? Urban Lawyer 4 (Article 4).
Farley, J., et al., 2007. Opening the policy window for ecological economics: Katrina as a focusing event. Ecological Economics 63, 344–354.
Georgescu-Roegen, N., 1975. Energy and economic myths. Southern Economic Journal 41 (3), 347–381.
Glaeser, E., 2007. Can Buffalo ever come back? Probably not—and government should stop bribing people to stay there. City Journal Autumn. http://www.city-journal.org/html/17_4_buffalo_ny.html.
Gold, M., Sagalyn, L., 2011. The use and abuse of blight in eminent domain. Fordham Urban Law Journal 38 (4), 1119–1173 (May).
Gordon, C., 2004. Blighting the way: urban renewal, economic development, and the elusive definition of blight. Fordham Urban Law Journal 31, 305–337.
Gordon, C., 2008. Mapping Decline: St. Louis and the Fate of the American City. University of Pennsylvania Press, Philadelphia.
Grigsby, W., et al., 1987. The Dynamics of Neighborhood Change and Decline. Pergamon, Oxford.
Hartshorn, T., 1971. Inner city residential structure and decline. Annals of the Association of American Geographers 61 (1), 72–96.
Kingdon, J., 1995. Agendas, Alternatives, and Public Policies, 2/e. Harper Collins, New York.
Krumm, R., Vaughan, R., 1976. The Economics of Urban Blight. RAND, Washington, DC.
Ostrom, E., 2005. Understanding Institutional Diversity. Princeton University Press, Princeton.
Platt, R., 2004. Land Use and Society: Geography, Law, and Public Policy, Revised Edition. Island Press, Washington, DC.
Pritchett, W., 2003. The 'public menace' of blight: urban renewal and the private uses of eminent domain. Yale Law & Policy Review 21 (1), 1–52.
Rees, W., 2003. Economic development and environmental protection: an ecological economic perspective. Environmental Monitoring and Assessment 86, 29–45.
Robinson, Cole, 2007. Urban Blight: An Analysis of State Blight Statutes and Their Implications for Eminent Domain. National Association of Realtors, Washington, DC.
Ross, H., 1996. Housing code enforcement and urban decline. Journal of Affordable Housing & Community Development 6 (1), 29–46.
Ross, C., Mirowsky, J., 1999. Disorder and decay: the concept and measurement of perceived neighborhood disorder. Urban Affairs Review 34, 412–432.
Shlay, A., Whitman, G., 2006. Research for democracy: linking community organizing and research to leverage blight policy. City & Community 5 (2), 153–171.
Silverman, R.M., Yin, L., Patterson, K.L., 2012. Dawn of the Dead City: an exploratory analysis of vacant addresses in Buffalo, NY 2008–2010. Journal of Urban Affairs. http://dx.doi.org/10.1111/j.1467-9906.2012.00627.x.
Skogan, W., 1990. Disorder and Decline: Crime and the Spiral of Decay in American Cities. University of California Press, Berkeley.
Stone, D., 2002. Policy Paradox: The Art of Political Decision Making, Revised Edition. W.W. Norton & Company, New York, NY.
Swyngedouw, E., et al., 2002. Neoliberal urbanization in Europe: large-scale urban development projects and the new urban policy. In: Brenner, N., Theodore, N. (Eds.), Spaces of Neoliberalism: Urban Restructuring in North America and Western Europe. Blackwell, Oxford, pp. 195–229.
Teaford, J., 2000. Urban renewal and its aftermath. Housing Policy Debate 11 (2), 443–466.
Tiebout, C., 1956. A pure theory of local expenditures. Journal of Political Economy 64 (5), 416–424.
Voinov, A., 2008. Systems Science and Modeling for Ecological Economics. Academic Press, London.
Weber, R., 2002. Extracting value from the city: neoliberalism and urban redevelopment. In: Brenner, N., Theodore, N. (Eds.), Spaces of Neoliberalism: Urban Restructuring in North America and Western Europe. Blackwell, Oxford, pp. 172–193.
Wilson, D.S., 2011. The Neighborhood Project: Using Evolution to Improve My City, One Block at A Time. Little, Brown and Company, New York, NY.
Wilson, J.Q., Kelling, G.L., 1982. Broken windows. Atlantic Monthly. 29–38 (March).