

'Smart' sustainable urban regeneration: Institutions, quality and financial innovation

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abstract

Cities around the world are under pressure from population growth, frenetic global economic restructuring, and climatic perturbations. Some, like London, attract an excess of speculative, momentum or tax-informed inward investment to finance their intensification. Provincial towns, on the other hand, which sustain extractive metropolii, can wither without capital or talent. Sensible planning and calibrated regional investment is the antidote to polarisation but confronts an apparent 'smart' or 'sustainable' conundrum. Grandiose, technical megaprojects like Songdo or Masdar cities and sprawling, disconnected estates are an anathema. We articulate a putative smart and sustainable solution ('*smart-SUR*') with 'institutional', 'project' and innovative 'funding' components and explore mega-urban regeneration projects in the UK and Holland. *Smart-SUR* has geographical, procedural and teleological aspects. Its mechanism involves local engagement, institutional strengthening, tight project screening and innovative regenerative funding. Its outcome are inclusive, measured, and coordinated transformations which 'sweat' existing assets, counter the long-tail of educational failure, and catalyse productive local innovation.

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1. Introduction

In coming decades, (Floater, Rode, Friedel, & Robert Steering, 2014) conurbations confront unprecedented growth with internal and external challenges in the maelstrom of the 'infernal machine' (Bordieu, 1998: 100). Cataclysmic events like war, tsunamis or volcanic eruptions are dramatic examples of external threats. When Santorini erupted in the second millennium BC, it destroyed Akrotiri, and wiped out Minoan coastal settlements on Crete. In 79AD, Vesuvius buried Pompeii. Unlike the contiguous diffusion of pyroclastic flows, in modern times disruptive technologies leapfrog and undermine incumbents. Detroit illustrates how poor management of technological disruption can tip a chronically stressed system into terminal decline. Besides war or acute geological and technology shocks, alterations to trade, culture, migration, rainfall or climate can all unsettle settlement *status quo* (Hall & Hesse, 2013; Hopkins, 2014). One response is to build new garden or other cities. When its Nile tributary silted-up, the entire city of Piramesse in Egypt was re-located (Bietak, 1981).

As well as external perturbations, cities evolve endogenously or they stagnate. Planning complacency, corruption or

underinvestment in civic and public amenities can jeopardise progressive change. Poor management and diminished infrastructure can bequeath a toxic legacy of unstructured sprawl and pollution. In dystopic megacities, slums abut affluent, gated enclaves and resentment breeds. Unstructured urbanization spillovers manifest in poor health, air pollution, traffic congestion, psychologically stunted children and crime. Such spatial externalities consume 15% of Beijing's GDP and cost the United States economy US\$ 400 billion annually (Litman, 2014). The failure to tackle spatial and market externalities is neither 'smart' nor 'sustainable'. Sustainable prosperity impels inclusive and capable planning institutions, focused on green infrastructure (Acemoglu & Robinson, 2012; European Climate Foundation, 2010; Geltner & de Neufville, 2014; Turner, 2014). Foresight, policy coordination and judicious interventions could shift current dystopic urban trajectories towards more compact, connected, resilient and inclusive futures as a pre-requisite, but no guarantee of, *eudemonic* well-being (Wadley, 2010). In contrast to *hedonic* well-being, the *eudemonic* focus is competence, autonomy and relatedness, not material tokens of status.

Mega-projects like Songdago (Korea), Maasdar (UAE), Skolkovo (Russia) or Dongtan (China) are 'unlikely to deliver widespread, lower level Maslovian sustainability (*ibid.*:19) and have high opportunity costs. Mega-projects are untamed political problems,

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invoking contested information (Bruijn & Leijten, 2008). Operational risks include, fraud, cost escalation, cack-handed oversight (Flyvbjerg, Bruzelius, & Rothengatter, 2003a). Mega-project outcomes can underwhelm, polarise communities or rapidly depreciate. Less grandiose urban transformation, involve territorial foresight, debate, local engagement, institutional collaboration, project scrutiny and smart finance (Adair, Berry, Hutchinson, and McGreal, 2007; Güell & Redondo, 2012). For Batty (2013), social innovation resolves the ‘smart’ technical or social paradox. Noting acute shocks, chronic stresses and contested futures visions, the research seeks a pathway for smart and sustainable urban regeneration (*smart-SUR*) for *eudemonic* empowerment, which eschews profligate mega-construction or debilitating *laissez faire*.

2. The problem

In coming decades, most global growth will be urban (Floater et al., 2014) yet planning regimes in many conurbations seem curiously ill prepared to tackle looming internal and external challenges in the maelstrom of the ‘infernal machine’ (Bordieu, 1998: 100). The purpose of this paper is to articulate and substantiate a smart and Sustainable Urban Regeneration (*smart-SUR*) framework with procedural and multiple teleological dimensions, captured via smart institutions, quality projects, and innovative funding as illustrated in Fig. 1. Place-rooted and soundly administered, smart projects balance commercial with public realm considerations. The *smart-SUR* framework could help to inform resilience planning amidst the regional and local noise (Chorley and Haggett, 1965). It balances localism with informed transformation for employment, aesthetics, logistics, or distributive justice but it is tightly overseen and tempered by the rule of law. Site visits and grassroots consultation restrain excess and refine transformative goals for beautification, pedestrian connectivity, waste management, network connectivity, or ecological conservation.

Urban threats and current urban policy flux impel the *smart-SUR* theoretical framework. An elaboration of the institutional, project and funding aspects of the putative model provided some discursive corroboration of its relevance as a screening tool for planners, developers, financiers, or residents. Remote, secondary data testing of the screening tool flagged the need for site visits and grounded analysis, conducted for a regeneration project in Utrecht, Holland (see Figs. 2 and 3).

3. Threats impelling a smart response

Cities confront unprecedented internal and external challenges. Cataclysmic ones include war, tsunamis, or volcanic eruptions. When the Thera (Santorini) volcano erupted in the second millennium BC, it destroyed Akrotiri, and wiped out Minoan coastal settlements on Crete. In 79AD, Vesuvius buried Pompeii. Unlike the contiguous diffusion of pyroclastic flows, in modern times disruptive technologies can leapfrog and undermine incumbent urban industries. Detroit illustrates how inadequate strategic response to technological disruption can tip chronically stressed systems into decline. Besides war or acute geological and technology shocks, alterations to trade, culture, migration, rainfall, or climate can all unsettle settlement *status quo* (Hall & Hesse, 2013; Hopkins, 2014). The response to catastrophe varies with regime priorities and capabilities. When its Nile tributary silted-up, the entire city of Pi-Ramesses in Egypt was re-located (Bietak, 1981).

Apart from dramatic external threats, constraints or endogenous forces can lead to dystopic urban trajectories and bequeath malignant outcomes, involving congestion or a toxic legacy of unstructured sprawl and pollution (e.g. Delhi in India). Dystopic megacities are characterised by planning complacency, poor management, corruption, or underinvestment in civic and public amenities. Resentment breeds in slums that abut affluent, gated enclaves. Unstructured urbanization spillovers manifest in poor health, air pollution, traffic congestion, psychologically stunted children, and crime. Such spatial externalities consume 15% of

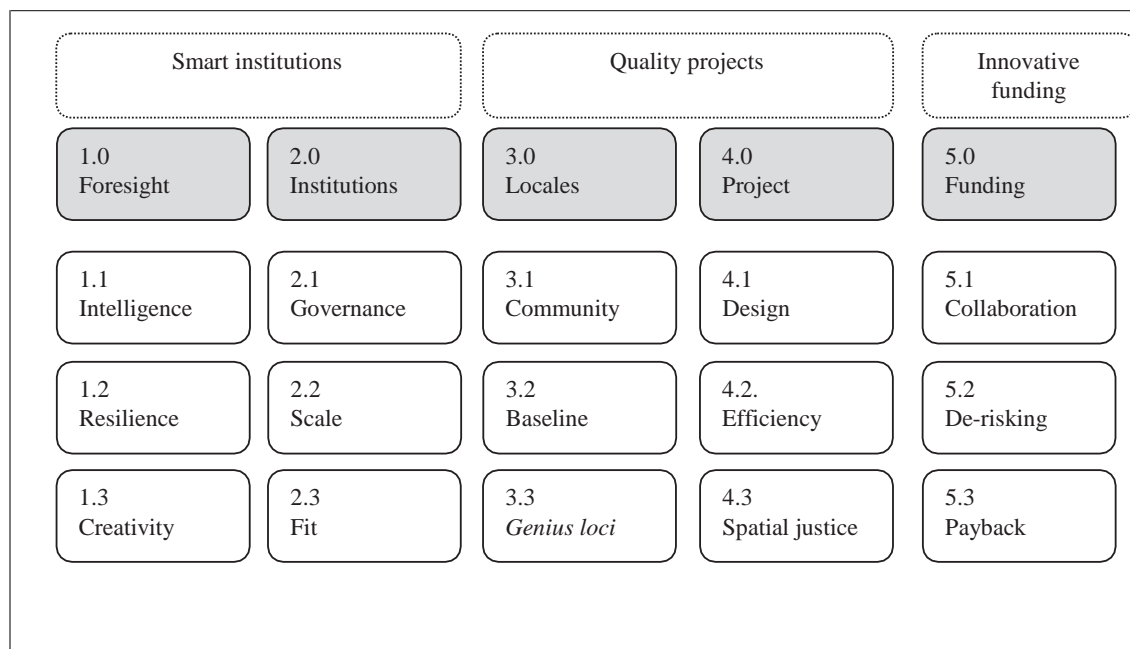


Fig. 1. Outline of putative *smart-SUR* conceptual framework, involving institutional, project and funding dimensions. Source: Authors (2014), adapted from Thomas et al. (2000), LópezLópez, Thomas, and Wang (2008), von Brown and Gatzweiler (2013) and Floater et al. (2014). Smart institutions presume sound macro policy at the national scale with policies to incentivise balanced development and correct market failure. At urban scale, the green ‘design’ aspect incorporates conservation of ‘natural capital’ and ‘connectivity’. Technical progress and productivity sit within ‘efficiency’. ‘Spatial justice’ and ‘resilience’ addresses marginality and social exclusion.



Fig. 2. Utrecht Station Area Redevelopment (USARP) in the Netherlands plans to connect the station with the historical core. Source: Authors (2014).

Beijing's GDP and cost the United States economy US\$ 400 billion annually (Litman, 2014).

Clearly, the failure to tackle spatial or market externalities is neither 'smart' nor 'sustainable'. *Smart-SUR* seeks to internalise them and facilitate urban adaptation for sustainable prosperity. Its constituents are foresight, policy coordination, and well-funded but judicious interventions. It impels capable planning institutions, focused on more compact, connected, resilient, and inclusive futures as a pre-requisite, but no guarantee of, *eudemonic* well-being (Wadley, 2010). Rather than indiscriminate output or even *hedonic* well-being, the *eudemonic* focus is competence, autonomy and relatedness of citizens (Acemoglu & Robinson, 2012; European Climate Foundation, 2010; Geltner and de Neufville, 2014; Turner, 2014).

However, many obstacles block transformational change, notably political disagreement, lack of funding and institutional weakness. Operational challenges include contested information (Bruijn & Leijten, 2008), fraud, cost escalation, or maladroit oversight (Flyvbjerg et al., 2003a). Obstacles aside, mega-project outcomes can underwhelm, polarise communities, or rapidly depreciate. Mega-projects like Songdo (Korea), Maasdar (UAE), Skolkovo (Russia) or Dongtan (China) have high opportunity costs and are 'unlikely to deliver widespread, lower level Maslovian sustainability' (Wadley, 2010). To deliver these, Güell and Redondo (2012) call for a more tempered approach, involving territorial foresight, debate, local engagement, institutional collaboration, project scrutiny, and smart finance. For Batty (2013), social innovation could resolve the 'smart' technological/grandiose or social/grounded

paradox noting acute shocks, chronic stresses, regime malfunction, and contested futures visions, the rationale for the genesis of *smart-SUR* is clear. It could illuminate pathways for *eudemonic* empowerment that eschews profligate mega-construction 'white elephants' or the worst deprivations of debilitating *laissez-faire*.

4. UK backdrop

Having touched on *smart-SUR* definitional tension, place, and institutional complexity, we review aspects of the UK backdrop and planning policy to ground the research. It presents a mixed picture with bleak, quasi-Dickensian, or Panglossian interpretations.

4.1. Panglossian narrative

Arguably, more so than in France, English planners have tempered the worst deprivations of industrial blight and sprawl but strangled housing supply. Despite polarisation and policy discontinuity, some remarkable regeneration projects have transformed cities like Liverpool, Manchester, and Glasgow (Talon, 2010). Iconic projects notwithstanding, British housing markets remain starkly segregated. Despite demographically induced intensification pressures, pockets of deprivation persist (Meen, 2009). To eliminate them, the Urban Task Force (1999) made over 100 recommendations, including design excellence, brownfield development, and higher densities. One billion (£) of public investment and tax incentives supported urban renaissance (DETR, 2000;



Fig. 3. Construction of pedestrian and cycling walkways for Utrecht Station Area Redevelopment (USARP) in the Netherlands. *Source:* Authors (2014).

Colomb, 2007). Schemes such as the Community Development Projects or the Neighbourhood Renewal Strategies targeted deprived areas to attenuate territorial injustice.

4.2. Quasi-Dickensian narrative

On the other hand, massive injections of public funds for the Olympics, Cross-Rail, and Kings Cross regeneration were arguably less spatially progressive. Whilst the London Plan (Greater London Authority, 2011) identified ‘polarisation’ (*ibid.* s1.27) and paid lip service to ‘promote equality and tackle deprivation’ (*ibid.* s4.61), for Edwards (2009), Kings Cross regeneration was ‘essentially a business activity aimed at growth and competitiveness.’ Despite supposed ‘extensive “consultation,” local communities felt disenfranchised’. Locals were ‘endlessly listened to’ but had ‘no detectable power to determine the outcome’ (*ibid.* 23). Regionally, UK planning is administration presents a confused jumble of district, county, or local tiers to frustrate coherent national housing supply. Local resentment centres on the authoritarian imposition of geographically mal-adapted housing targets. Privileged locales articulate objections most strongly. For Piketty (2014) Piketty (2014) the root cause of UK polarisation is the wasteful economy of ‘patrimony’. Instead of treating the root causes of capital’s concentration and malignancy, the regime tinkers intermittently with its symptoms. Rather than progressive tax reforms to curtail evasion or speculative excess, policy fluctuates electorally within a media circus. Robust educational reform falters in the face of entrenched inequality, ministerial posturing, and departmental managerialism or chronic ineptitude. Nationally, London’s economic dominance festers, undermining affordability and destabilising long-term productivity growth. Regionally, distinctive adjacent towns like Gloucester and Cheltenham reflect atavistic class divisions. Notwithstanding a charade of contrived ‘festivals’, status differentials (rooted in wealth and housing inequity) fracture local communities and

undermine authentic ‘dwelling’ (Heidegger, 1954; Seamon, 2000). In the populist imagination, rogue landlords exploit an impecunious and unskilled underclass of renters on zero hour contracts who, in desperation, turn to unscrupulous payday lenders. In stark contrast, the bourgeoisie relish status, overpriced dwellings, trophy wives, outlandish vehicles, or designer baubles. In this extractive narrative, corruption, cronyism, and financial malpractice enrich not enterprise or effort.

4.3. Conclusion

A balanced assessment of the UK built environment backdrop sits between the extreme narratives but wealth inequality remains troubling. The richest 10% of the population controls 44% of the nation’s total wealth. In contrast, the poorest half of the population subsists on 9% of the resources (Lucchino & Morelli, 2012; ONS, 2014). Current UK government urban policy is investment-orientated and growth-focused with somewhat less concern for authentic community engagement and distributive justice (Rawls, 1971). Policy flux and factional wrangling has left a muddle and a bewildering confusion of policy levers:

- Local Growth Fund (LGF), available for Local Enterprise Partnerships (LEPs).
- The Growing Places Fund (GPF).
- Regional Growth Fund (RGF) Infrastructure Guarantees.
- Public Works Loan Board (PWLB).
- Enterprise Zones (EZs).
- Community Infrastructure Levy (CIL).

To conclude, the admittedly eclectic, review of UK policy context revealed two opposing euphoric or gloomy narratives but impels a considered planning mechanism to address invidious aspects of spatial and social malignancy without undermining the rule of law or sparking nefarious unintended consequences.

5. Smart institutions

Having touched on the external and internal risks, policy muddle, and polarisation that impel *smart-SUR*, we now elaborate on the first of its three pillars. Smart institutions should foster quality growth and curtail its extractive modes. Requirements include a futures orientation towards resilience and creativity, sensible spatial architecture, and disposition towards collaboration. In contrast to extractive ones, smart institutions seek to remedy, not exploit market failures and attenuate, not reinforce structural inequalities (Acemoglu & Robinson, 2012). Unlike in *comprador* capitalism, smart urban development is accountable, people-focused, and conserves natural systems (Thomas, 2000). It taps new online technologies and geographical data to capture, model, or visualise projects that inform planning and negotiations. Collaborative interplay begins with appropriate scales (boundaries) and tight institutional fit (design). Proper governance reduces financial manipulation or fiscal distortion and incentivises projects with conservation, education, or health spinoffs. Inclusive institutions, authentic debate, subsidiarity, and the rule of law temper extractive proclivities. Smart collaborative institutions negotiate or muddle through (Lindblom, 1959) but avoid the quagmire of strategic drift. Integrity, foresight, and competence, enable them to screen, plan and execute quality projects for urban resilience or enterprise. Resilient settlements can better absorb disturbance or reorganise to retain function, structure, and identity (Forbes & et al., 2009; Holling, 1973). Redundancy and a balance of social, economic, and environmental capital strengthen it (Wilson, 2014). Just as genetic predisposition, trauma exposure, or informed treatment engender psychological resilience (Rutter, 1985) so too, urban resilience invokes planning (smart institutions), selective regeneration (quality projects) and system upgrade funding (von Braun & Thorat, 2014). Smart institutions employ competent and cooperative staff to generate useful output with positive social and ecological spillovers (Rogers, 2012; Turner, 2014). Productivity gains come without energy or carbon intensification. Rather, efficiency gains come from distributed energy, transport, and information networks.

5.1. Foresight

A smart response to multiple urban challenges begins with the articulation of purpose (to engineer resilience or foster creativity). The next step is to collect useful intelligence to understand places (Floater et al., 2014) and to celebrate their distinctive historicity, heritage, or landscapes. Informed spatial transformations (outcomes) rely on science or architectural and design excellence but need grounded urban intelligence. Archival research, baseline analysis, expert views, and structured stakeholder engagement help understand place character (ambience and atmosphere). Comprehensive site diagnostics informs smart institutions on relevant, scientific, commercial, and local concerns about contamination or disruptive intensification (habitat loss, blight, noise, emissions, congestion, or service stress). In smart cities, decision-support or geographical technologies help stakeholders visualise alternate project permutations to evaluate architectural, connectivity, spatial justice, and ecological impacts.

5.2. Institutions

Smart planning institutions are properly articulated (scale and scope) and governed. Strategic leadership, governance, and institutional architecture help assure effective, efficient, inclusive, and transparent project management. They balance strategic foresight and ‘top down’ leadership (Hemphill, Berry, & McGreal, 2004) with local dialogue. Inspired by the common good, smart planning

interventions seek to attenuate spatial injustice without undermining customary or *bona fide* formal property rights or cultural practices. Top-down leadership and vision drives strategic transformation of urban environments (Freedman, 2014) but *smart-SUR* is reflexive and democratic. It may even reject transformation and intensification in favour of preservation or conservation. *Smart-SUR*’s institutional culture is ‘managerialist’ in the sense that it eschews spectacle and seeks long-term solutions to substantive economic and social problems (Harvey, 1989). Governance ensures legitimate and cost-effective delivery of complex projects (Termeer, Dewulf, & van Lieshout, 2010). It comprises the formal policies, procedures, and informal culture and norms to focus corporate activity and attenuate agency problems (corruption, nepotism or ‘free-riding’).

Pragmatism and diplomacy helps institutions navigate complexity and local power politics or vested interests. Institutional fit, good governance and authentic consultation mitigates the risk of outlandish projects, fanciful projections, and cost blowouts. Tight governance, financial transparency, and proper tendering cuts waste and roots out corruption or nepotism. It increases competition and broadens private participation in critical infrastructure. Its antithesis is ‘patrimony’, oligopolistic free riding, and ‘plutocratic dystopia (Piketty, 2014). Brazil’s World Cup stadium construction projects fail to pass muster against the subsidiarity, spatial justice and transparency criteria but even in tight institutional settings, misconstrued purpose, project complexity or market turbulence can scupper performance (Althule & Luberoff, 2003; Flyvbjerg et al., 2003a; Van Marrewijk, Clegg, Pitsis, & Veenswijk, 2008). Flyvbjerg, Holm, and Buhl (2003b) found that nine out of ten projects went over budget with typical costs blowouts of around one third.

Institutional design and partnership management facilitate project delivery. Proper spatial, temporal and functional fit help configure institutional and network architecture to match operational requirements. Ekstrom and Young (2009) note that misfit occurs when institutional arrangements ignore ecosystem character, function and dynamics. Spatially, cross-scale misfit occurs where anthropogenic administrative or organisational boundaries diverge from bio-geophysical ones. Catchment management and water security problems are typical. Temporally, urban decision-makers can have a short-term, electoral focus. Functionally, nested organisational concerns can overwhelm foresight or collaboration.

To conclude, the institutional literature supports its incorporation within *smart-SUR*’s to mitigate uneven geographical development. Its constituents are strategic foresight and well-functioning and tightly fitting institutions, orientated towards resilient and creative futures. Institutional constraints involve skills, technology, finance, vested interests, collaborative silos, spatial data, and community alienation or fragmentation (Talon, 2010).

6. Project quality

Urban regeneration quality considerations are multi-faceted but include architecture, design, and public realm, or connective infrastructure like sky trains or rail tunnels for compact or connected cities (Floater et al., 2014). In terms of place-making, the ‘smart’ solution confronts meaning ambiguity, ‘place’ complexity, and institutional diversity. Places are not two-dimensional but complex constructs with multiple agent network interactions. Institutionally, traditional planners confront alternate policy *foci* (firm competitiveness, local health, school operation). Clashes between conceptual frameworks and legitimising rationales are commonplace (Healey, 2007). The rapidly evolving global economy accentuates stakeholder tensions. The demise of *Deepdene* palazzo and its demolition in 1967 to make way for drab offices in Dorking

provides a salutatory example of crass commercial land transformation, bereft of local place sensitivity and without national policy coherence (Jakobsen & Høvig, 2014; Robinson, 2012). Even sophisticated hedonic models which isolate interior, exterior or urban-scale quality design components that add commercial value would not prevent such planning mistakes (Nase, Berry, & Adair, 2013), reinforcing the need for balanced assessment instruments such as *smart-SUR*.

7. Innovative funding models

The third pillar for *smart-SUR* is viable public or private funding model. The current commodified fiscal regime can undermine forward-thinking investments like Transport Orientated Developments (TOD) or canal restoration projects with land amalgamation or complex planning, geotechnical and construction issues (Searle, Darchen, & Huston, 2014). Hence, political and business cycles, public finances, or market conditions shape or constrain transformation viability. Capital and space market intelligence can detect turning points which can alter project financial viability. In due course, gentrification can mediate adverse market conditions and unlock commercial potential of ethnic locales as seen with Brixton in London. However, whilst commercial or subsidised viability is necessary it is not the sole consideration for *smart-SUR* (Brookes, 2013; Vanolo, 2014).

One innovative source of finance is to capture the uplift in development land values, induced by train, ferry, or street construction/beautification. The mechanism can be either direct (lease charges or infrastructure connection fees) or indirect, via higher tax. To tax land uplift increments, first designate the beneficial, value-capture project hinterland and then assign collection rights to the project proponent, usually, a special purpose vehicle (SPV). The SPV clarifies project ownership, allocates responsibilities, costs risks, and orchestrates construction. The associated funding model structures stakeholder rights, conditions, disbursements and repayment profiles and firms-up proponent relative risk profile. To assess their risk exposure, investors scrutinise projects looking at SPV capability and funding credibility, site position, land amalgamation, project marketability, and government support. Theoretically, due-diligence should weed out bad urban infrastructure projects, situated in unpromising sites with fanciful business models or weak government support. In practice, projects, like the Edinburgh tram system, are often delayed or over-budget (Easley & O'Hara, 2004). *Smart-SUR* rests on a credible corporate structures, strong public–private alliances, sound geographic context, and financial credibility. Disruptive alternative financing technologies like ‘crowd-funding’ and ‘digital currencies,’ such as Bitcoin, could revolutionise the sector.

The private sector will only fund commercially viable urban regeneration so that investors can eventually recoup project outlays but, in the interim, get adequately compensated for the risks assumed. Compensation for risk reflects the opportunity cost of alternative investments foregone. In the public arena, positive public-realm or social improvement ‘spillovers’ can compensate for a financial deficit. Where substantive public realm investment is necessary, a public–private partnership (PPP) can help (Pattberg & Widerberg, 2014) but private investors seek payback assurance and competitive returns for risk, in line with targets, assessment criteria, timescales and objectives (Adair et al., 2007). General tax levies aside, investor payback relies on the capture or internalisation of dispersed spatial benefits to generate commercial revenue streams for the PPP. Alternatively, Social Impact Bonds (SIB) can raise finance (Finance for Good, 2014). In the SIB model, bondholders not taxpayers initially bear risk defraying public disbursements. The SIB commissioning body (government) only pays once auditors confirm agreed and social or environmental milestones.

Tax Increment Financing (TIF) provides another mechanism to capture *ex-post* project benefit streams. Within TIF zones, recuperation of public real betterment costs is excised from local government and outsourced to the proponent himself. Infrastructure-induced property capital gains are ‘ring fenced’ to offset some of the initial upfront disbursements. In practice, TIF means the local authority effectively cedes element of its fiscal sovereignty to the proponent.

Given collaboration complexity and repayment risk, *smart-SUR* must balance hegemonic idealism with self-determination, legal tradition, and policy settings. Public and ecological considerations temper commercial ones. Risk diagnostics inform the evaluation of its multiple success criteria. Whilst ideally *smart-SUR* management culture is administrative and collaborative not exploitative or individualistic, it still relies on investment and policy clarity, sound financing and risk mitigation (Adair, Berry, McGreal, Dennis, & Hirst, 2000). Extensive information must be harvested on proponent capabilities (partnership institutionalisation, management, and solvency), project design, and capital market cyclical situation and space market prospects (planning regime, lease rates, and sales margins). Subsequently, risk analytics screens out ‘noise,’ integrates and structures data to tailor financial projections, ascertain option values, estimate terminal yields, and fine-tune capitalisation rates. Funding refinements sharpen information fields and fine-tune risk assessment. Smart funding strategies can either be internally-focused, like multi-asset class factor models, or externally-oriented to cut information asymmetry (Diamond & Verrecchia, 1991). In the latter vein is a ‘smart beta’ strategy which scans for under-rated proponents/projects with stronger service debt capacity, higher returns or lower volatility prospects than conventional financial metrics would suggest. Popular industry risk and performance diagnostics include *RiskMetrics*; *IPD real estate information*; *MSCI ESG* (environmental, social and governance), and ISS corporate governance research.

To conclude, *smart-SUR*'s socially inclusive aspirations require proper due diligence around partnership structure and public or private funding models. In deprived areas, effective public realm enhancement is expensive. Outlays are either directly recouped from local beneficiaries or they are indirectly recovered from proximate or remote general taxation.

Smart-SUR partnership effectiveness requires an agreed territorial vision and operational effectiveness. It calls for leadership, collaboration, institutionalisation, and local legitimacy rooted in dialogue and community spatial spinoffs – jobs, health, conviviality, and spatial justice. Its long-term goals are urban ‘resilience’ and community ‘creativity’ but its ethos is public-spirited, administrative and policy-driven. However, multiple and lofty SUR aspirations load development costs on to projects in disadvantaged locales which can erode feasibility. Public funding aside, commercial counterweights are land-gifting, tax breaks, subsidies, project de-risking, or TIF. De-risking solutions involve corporate governance, structured community dialogue and a robust payback model. In propitious locales, TIF or social infrastructure bonds can provide alternate funding solutions.

Given the stark distributional backdrop, ‘smart’ development must address, if not allocative minutia, then at least the broad procedural mechanics for an inclusive society without compromising enterprise. Practically, SUR sidesteps pedantic semantic quarrels over ‘sustainability’ or statistical indicators for it, and instead backs catalyst projects for ‘high-quality city-based lifestyles with low carbon-based mobility’ (Banister, 2012). In this regard, pedestrian or dedicated cycle networks would pass muster (Southworth, 2005). Table 1 gives some global regeneration examples, which enhance ‘hard’ infrastructure (built environment and transport logistics) but also address ‘soft’ institutional and spatial justice dimensions. Strategically diminished development undermines

Table 1
Eclectic sample of global iconic regeneration transformations, illustrating ‘hard’ and ‘soft’ aspects. Source: Authors (2014).

Project	‘Hard’/tangible investment	‘Soft’/Intangible
Bordeaux <i>Bordeaux Métropole Aménagement</i> (France 1995–2007)	Waterfront development Housing construction Public realm upgrades Tram system	Youth training heritage management
Paris <i>Promenade Plantée</i> (France 2000)	Elevated causeway and park	Access to Bastille Opera
Madrid <i>Río Manzanares</i> (Spain 2006 a 2011)	Riverfront remediation of Central 8 km green space, foot-bridges, and cycle routes	Public plaza Job access to CBD
San Francisco, <i>Embarcadero</i> (USA 1991)	Demolition of ugly freeway	Waterfront promenade
Bogotá <i>Juan Amarillo</i> (Colombia 1990s)	Construction of palm-lined boulevard, squares and plazas 45 km of greenway and 300 km bike lanes	New retail in public plaza Job access to downtown
Seoul <i>Cheonggyecheon</i> (South Korea 2003–2005)	Mass-transit system Reclaimed river frontage Upgrades to local retail	Enhanced public transit Pedestrian park amenity

innovation capacity. Inequity, corruption, and mis-governance are its hallmarks. In contrast, smart remedies involve strategic leadership, organisation fit, IT connectivity, and local up-skilling (Colantonio & Dixon, 2010; Couch, 1990). For Roberts (2000), sustainable regeneration means realising a comprehensive vision which makes ‘lasting improvement in the, economic, physical social and environmental conditions of an area.’ ‘Urban regeneration,’ like its utopian *Garden Cities* precedents (Howard, 1902), extends beyond narrow economic development or physical ‘urban renewal.’ Its proximate pragmatic physical, economic, or environmental upgrades improve the daily lives of ordinary people. Within financial constraints and realistic limits, sustainable regeneration improves places, stimulates prosperity, and fosters inclusive local capabilities. For Turok (1992: 361), unrestrained market-led development fails to consider locals or underlying local economy and ‘may have detrimental consequences for the economic fabric of cities and for the quality of life of their residents.’ We can split regeneration objectives into ‘hard’/tangible and ‘soft’/intangible ones:

- ‘Hard’ place and infrastructure upgrades (buildings, precincts, facilities, technology and logistics).
- ‘Soft’ intangible investments to improve the environment (emissions control, remediation) or develop human capital (job creation, health programs, education and skills training, cultural activity, service provision).

The sample of international regenerations projects substantiates the imperative for an evaluation tool to help navigate complexity, build consensus and overcome policy flux. *Smart-SUR* could help focus stakeholders on long-term urban transformation goals, rectify organisational misfit and galvanise finance. It mandates foresight, integrity, institutional fit, local consultation, design ingenuity, construction expertise, and financial acumen. Its transformative impacts target connectivity, productivity, ecological and community resilience (De Wit, 1988).

8. Remote investigations

Having generated the *smart-SUR* framework, we investigated its plausibility against mainstream construction literature, as illustrated in Table 2.

The structured analysis of the construction literature supports the three *smart-SUR* pillars of smart institutions, quality projects and sustainable funding.

Next, we investigated and evaluated one regional and ten London regeneration projects, rendering secondary data within the *smart-SUR* framework. We scored each project against aspects of the *smart-SUR* institutional, project and funding domains using a five-point Likert scale.

Table 2
Summary of *smart-SUR* domains considered in mainstream project literature. Source: Authors (2014).

Author (year)	Smart institutions	Quality projects	Sustainable funding
Freeman and Beale (1992)	x	x	
2 Savindo, Grobler, Parfitt, Guvenis, and Coyle (1992)	x		
3 Turner (1993)	x	x	x
4 Munns and Bjeirmi (1996)	x	x	
5 Atkinson (1999)		x	x
6 Chan and Chan (2004)	x	x	
7 Cox, Issa, and Aherns (2003)		x	x
8 Westerveld (2003)		x	
9 Phua (2004)		x	x
Nguyen, Ogunlana, and Lan (2004)		x	x
11 Hemphill, Berry and McGreal (2004)	x	x	x
Sohail and Baldwin (2004)	x	x	x
13 Low and Chuan (2006)		x	x
14 Wedding and Crawford-Brown (2007)	x	x	x
15 Winston (2010)		x	
16 Shamas-ur-Rehman Toor and Ogunlana (2008)		x	
17 Shamas-ur-Rehman Toor and Ogunlana (2009)		x	x

However, when we populated the screening tool’s criteria with secondary data from web sites, e-Word of Mouth (blogs and social media) or project archival documentation, it could not adequately discriminate between projects. Table 3 illustrates the need for fine-grained primary data for proper urban regeneration project analysis.

9. Site visit

Finally, in May 2014, we conducted a site visit to Utrecht Station Area Redevelopment (USARP) project in the Netherlands as a practical proving ground for *smart-SUR*. The 3 billion Euro project was conceived back in the 1990s but construction only started in 2007. The redevelopment seeks to intensify and rejuvenate an inner city area, enhance cycling and public transport access and improve permeability between the old historical core and station precincts.

Specific construction elements included a new railway station area, renewal of the Hoog Cathrijne shopping mall and upgrades to pedestrian walkways as well as renovation of Catharijnesingal Canal. The site visit involved several rounds of interviews with key USARP stakeholders to discuss critical success factors and project bottlenecks. We found that managing diverse and multiple stakeholders accentuated an already complex project. USARP

Table 3

Results of UK urban regeneration project desktop screening with *Smart-SUR* with secondary-data (shaded to distinguish framework domains). Source: Authors (2014).

Smart aspect	Smart institutions						Smart projects						Smart funding		
	Intelligence	Resilience	Creativity	Governance	Scale	Fit	Community	Baseline	Genesis	Design	Efficiency	Justice	Collaboration	De-risking	Payback
Olympic	3	4	4	4	4	4	3	3	2	3	4	4	3	3	3
Arsenal	3	4	2	3	3	3	3	3	2	2	4	4	3	3	3
Wembley	3	4	3	3	3	3	4	3	2	3	4	4	4	3	3
Greenwich	4	4	3	3	3	3	3	3	2	3	4	4	4	3	4
Barking	3	4	3	3	3	3	3	3	2	3	4	4	3	3	3
Nine elms	4	4	3	3	3	3	3	3	4	3	4	4	4	3	4
Kings Cross	3	4	4	3	3	3	3	3	2	3	4	4	3	3	3
Kidbrooke	3	4	3	3	3	3	4	3	4	3	4	4	3	3	3
Wirral	4	4	4	3	3	3	4	4	2	3	4	4	3	2	4
Canning	3	4	3	3	3	3	4	4	3	3	4	4	3	3	3

interviews highlighted the problem of project evolution and interference by diverse stakeholders with conflicting agendas. Stakeholder pressure and political serendipity forced *ad-hoc* amendments to an already complex project. At times, influenced by short-term electoral and business cycles, government territorial foresight and long-term commitment wavered. Nevertheless, the project has survived its political and budgetary travails. Now, it is on track for completion in 2030.

10. Discussion and conclusion

We developed a *smart-SUR* conceptual framework with ‘institutional’, ‘project’ and innovative ‘funding’ components and corroborated its plausibility by:

- Outlining the UK urban regeneration backdrop and polarised narratives.
- Assessing some iconic international projects.
- Conducting a structured review of the construction and project management literature.
- Analysing secondary-data about significant UK urban projects.
- Investigating a mega urban regeneration project.

Smart and sustainable urban regeneration (*smart-SUR*) provides a useful tool to screen urban regeneration projects. It involves both procedural and balanced multi-faceted teleological considerations (outcomes and impacts). In developing the framework, we found conflicted notions of ‘smart’ and ‘sustainable’. Urban regeneration extends beyond development and engineering efficiency in terms of time, cost, and project delivery. Sustainable urban regeneration projects build on local roots and aesthetic identity but are complex with multiple contested goals and high information costs. Betterment ideals are balanced by practical awareness of competing *foci* and, hence, administrative complexity. *SUR* transformational aspirations for urban realm enhancement or spatial equity must be balanced by a sober consideration of legal and planning process, impulses to self-determination, entrepreneurship and, not least, financial viability. Smart partnership credibility and legitimacy is as important as *ex-ante* modelling of urban transformational outcomes or functional impacts. Regeneration oversight extends to monitoring of partnerships output (policy, contracts), construction milestones, local transformative outcomes, and eventual community impacts. Transformational outcomes could include density, green-space, connectivity, affordable dwellings,

energy use, waste, or financial returns. Considered deliberation involves due consideration of heritage, cultural diversity, and ecology. Improvements should eventually translate into impacts like local inward investment, start-ups, jobs, or tax receipts, spatial housing justice, permeability (pedestrianisation, cycling, and public transport). Notwithstanding spatial resolution or temporal cut off, indicators of disease, poverty or crime should decline. In short, a regenerated community is more resilient, healthier, and more prosperous but three obstacles hinder the practical implementation of *smart-SUR*.

10.1. Common vision

Except in authoritarian regimes, squabbling between stakeholders can delay, if not frustrate, the realisation of resilient or creative urban visions. Initially, politicians of different persuasion, planners in various tiers of government, fragmented local communities, small or large developers and local, remote, or online financiers are unlikely to share a common vision. Tools to formulate common goals could include local surveys, Delphi approaches, focus groups or other negotiated solutions to untamed political problems.

10.2. Partnership management

The success of regeneration projects hinges on an effective partnerships between multiple stakeholders who contest multi-dimensional futures visions for eudemonic empowerment. Effective partnership management entails (1) leadership, (2) capabilities, (3) a budget or on-going finance (4) framework for conflict resolution. Governance and transparent reporting confer legitimacy, demonstrate milestone delivery and facilitate adaptation.

10.3. Finance

Budgetary constraints or political and economic instability can delay or scupper regeneration. Neoliberalism, fiscal austerity, and pervasive corporate tax avoidance dampen socially inclusive aspiration and cut the public funding available for urban infrastructure. Private finance requires payback but its only source is developer charges or real estate taxes on ring-fenced benefit streams. In imperfect property markets with weak fiscal tax regimes, spatial betterment inflates contiguous house prices but cack-handed commercial payback models fail to police or capture public realm uplifts or logistics benefits. Without commensurate taxation of

property capital gains, regeneration is regressive unless projects deliberately target deprived locales. In fluctuating markets, an effective partnership between the public and private sector strengthens the commercial success of targeted projects. Private finance is constrained by the productive or predatory opportunity cost of capital. The vehicle for public sector support can vary but without it, for blighted districts in bearish markets, funding can evaporate. Strong public relations de-risking signals include propen- credibility, well-designed projects and structured community engagement for planning robustness. The London Plan (GLA, 2011) sent strong public relations de-risking signals to Olympic or King's Cross investors.

Our research makes four key contributions. First, it noted policy flux and political vicissitudes, site and engineering challenges, blight or social deprivation all complicate public realm transformation projects. Second, it postulated and investigated a *smart-SUR* multi-criteria framework to screen urban regeneration projects. Third, the research highlighted the limitations of secondary data for assessment. Documents, digital mapping, or street-view technologies are commendable but 'scuttlebutt' investigations are necessary to capture fine-grained institutional and site-specific regeneration issues. *Smart-SUR* project analysis invokes dialogue with diverse locals and experts, discussion with partners, process observation and audit of outputs, outcomes, and impacts. Finally, we stress the importance of stable and effective *smart-SUR* partnerships. Unless contained by independent, scientific assessment and conflict resolution mechanisms, stakeholder wrangling can delay or stop projects. On the other hand, autocratic project delivery without due reflection, tight oversight, or authentic local empowerment can bequeath 'white elephants,' urban dysfunction, debt, and the poison chalice of civic corruption.

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