This paper addresses the problem of balancing the supply of public urban space with demand. It is, in that sense, a paper on the economics of the public realm. It is written with urban planners and designers in mind and offers a set of analytical tools for thinking about the dynamics of open space, explaining the evolution of urban morphologies and predicting the outcome of urban designs. It considers the way in which shared and private spaces develop public domain problems and the way in which these are resolved by the clarification of property rights. Urban open space emerges from this analysis as a residual category of land and this has implications for the way open space is both designed and governed. It leads to the idea that the hierarchy of shared spaces in a city should correspond to a hierarchy of governing institutions. Physical and institutional design are both important in creating sustainable public realms and avoiding what the paper terms the tragedy of the urban commons.

This paper develops a behavioural theory of urban public space. It is a positive theory, in the sense of being descriptive and explanatory. The only normative assumption it makes is that the physical and institutional design of the built environment is good by virtue of any gains from trade that are unrealised in the absence of such design. It is a dynamic theory, offering a framework for understanding the evolution of urban space and yielding propositions that can be tested in prediction. Among these are the propositions that property rights over urban space tend to fragment over time; that valued public domain space with open access will be overconsumed; that congestion of open space leads to property-rights changes; that public domain space tends to shrink over time; and that stable spatial configurations of open space emerge residually as minimal configurations necessary to supply particular shared consumption benefits. From this last proposition, the theory might be characterised as ‘the residual theory of public space’. It offers a justification of urban design as a necessary societal function but one that should be accompanied by institutional design. The theory implies that sustainable urban design should anticipate the residualisation principle and be wary of over supplying public-domain space. Much of the argument applies more generally to urban planning, but I focus on urban space since it seems that there is a need for a well-formulated political economy of the urban public realm (Cuthbert, 2006; Shuffield 2004 and Tokyo architects Tsukamoto and Momoyo Kajitama who have popularised the idea of designing buildings and infrastructure to fit small residual spaces (Atelier Bow-Wow 2005).
Webster, 2003; Webster and Lai, 2003). This is done on the basis of assumptions about individual consumption behaviour, an approach that is able to provide explanation at a level of specificity useful to practitioners and amenable to detailed case study.

The crux of the argument is summarised in the next section. The remainder of the paper develops and illustrates the argument. The following section then considers the micro urban dynamics of urban space, setting up a typology of urban spaces and propositions about the evolution of their consumption characteristics, and this is followed by a section illustrating these with three stories of urban subdivision. The next section then explores the idea of the tragedy of the urban commons. The penultimate section considers the governance of public spaces and the final section concludes.

**The residualisation of public space: the argument summarised**

Public urban space is a collectively consumed good. It differs from private space (like bedrooms) in that many people co-consume the same quantity. Their co-consumption is non-rivalrous at levels of consumption below a congestion threshold. Over time, collectively consumed goods tend to reach and surpass the congestion threshold, however. They become over used through unrestrained competition. This is particularly so in cities, where people live at high densities. Re-investment and resource management can help avoid the degradation and depletion of a congested space but at a cost. Most public spaces and many other kinds of civic infrastructure are not well tended, however. It may generally be assumed that public space tends toward degradation over time because individual users enjoy the full benefits but bear only a fraction of the costs. The so called free rider problem leads to something like Hardin’s tragedy of the commons (Hardin, 1968), which is an endemic problem in cities. Two types of tragedy of the urban commons occur, which I designate as Type I and Type II. A Type I tragedy happens as individuals over consume urban space in the sense of building too densely and with too little open space. A Type II tragedy unfolds in respect of the over consumption of these open spaces – public parks, plazas, roads, sidewalks and so on. Paradoxically, the over-consumption problem also implies an over-supply

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3 Or, more generally, a collectively consumed resource.
4 Iconic public spaces that are valued highly by a large number of people tend, in rich countries, to command sufficient public resources to keep them beautiful, functioning and preserved for future users.
5 In the 1930s and 1960s, Britain set about dealing with the degraded legacy environments of its city centres. In the 1970s and 1980s it was the turn of the inner cities – the rings of early nineteenth century industrial housing, warehousing and small industry. The degradation of large industrial sites was taken on in a concerted way in the 1990s. Over the next 20 years it will be the turn of the British suburb – where over 80 per cent of urban Britons live. Cities are spatial manifestations of individuals’ compulsion to cooperate together in the pursuit of personal advancement, wealth, health and happiness. Civic goods such as open space make this cooperation possible but the problem of free riding means that demand for such goods always outstrips supply. This is the curse of the city.
problem: in a congested open space, common property rights are allocated to too many individuals. Congestion may be resolved by restricting these rights by institutional and physical design.

The result of congestion, degradation and depletion is as predictable as the congestion itself – a demand for the reassignment of property rights. Most collectively consumed goods are scarce goods. They are not the fictitious ‘public goods’ of the economics text book or the utopian ‘public’ realms of planning literature. Urban space tends to be consumed by particular individuals and groups – by ‘small publics’ (Webster, 2002, 402). Debates about public goods in applied economics and debates about public space in urban planning and architecture tend to use static categories. Public goods (open spaces) are non excludable and consumed without rivalry. Private goods (private spaces) are excludable and consumed rivalrously. In reality, excludability and contestability are continuously variable, not discrete attributes, of an open space. This leads to the idea that urban space tends to evolve over time. This is illustrated in Figure 1, which is a contingency table cross classifying urban space by the two criteria commonly used to distinguish private and public goods. The table hypothesises that land tends to change from being non excludable and non rival (category D urban space); to non excludable and rival (category C); to excludable and non rival (category B); and eventually to excludable and rival (category A). Category A urban space is a pure private good; and category D space a pure public good. Category C space is institutionally unstable and in need of property-rights reassignment. Category B space is a ‘club good’ and is stable so long as the club’s governing organisation can continue to control (a) the quantity and quality of the various attributes of space vulnerable to congestion and (b) the numbers of consumers. When these get out of balance, property rights will tend to be reallocated within the club, creating smaller and more efficient category B spaces or transforming parts into category A private spaces. The evolution of rights will tend to have the effect of reducing cooperation costs, with any efficiency gains stacked in favour of parties with the greatest power to influence institutional change. Any class of space in Figure 1 may change to any other class, but the dynamics of congestion and rights will tend to mean a long-term evolution in the direction of the arrows. Readers are invited to test this proposition.

6 When local streets become congested by unruly customers leaving a suburban pub, residents demand the right to restrain the activity via the restriction of opening hours for example. The right in contention is the right of use of the street. Should the pub be granted the right to operate in such a way that its customers over use the street (from the neighbours’ point of view) with noise and anti-social behaviour and by adding to demand for on-street parking spaces? Or should residents have the right to restrict the pub’s business in order to preserve their quality of life? The rights issue is symmetrical – either the pub has a right to impose some of its costs of production on local residents or residents have the right to impose some of the costs of consumption on the pub. The problem is that rights over congested, collectively consumed, space are unclearly allocated. The legal and political deliberations that result will attempt to restrain the competition.

7 Formal or informal; organised by voluntary group, State or entrepreneur.
against illustrations in this paper and their own evidence.

This dynamic typology makes explicit the idea that public spaces can be and should be governed according to their consumption characteristics. The question is how best to allocate property rights over the different types of space? 8

Historically there are two fundamental approaches to allocating scarce resources: by centralised administrative decision making and by decentralised voluntary exchange of property rights. The expansion of the state in the second half of the twentieth century has meant that the first of these has become the norm in respect to civic goods and services. Municipal government has generally become viewed as the rightful supplier of urban open space and the space it generally provided is assumed to be category D space. Where open space is provided by entrepreneurs as part of a development made up mostly of category A space, the municipal government typically ensures by regulation that it is supplied as category D space (even though it is technically feasible to make it excludable and convert it into a more sustainable category B space).

If urban open space were to be de-politicised, as is private urban space, then planners and designers would be freer to deliver sustainable urban spaces – in which institutional and physical designs are better aligned. There is no reason why the institutional design of open spaces should not reflect their carrying capacity and the specific nature of the demand to which they are principally targeted. Some spaces might be owned by the neighbourhood communities they serve, with rights of access and liabilities for their government bundled into private property deeds. These spaces may be legally excludable but not necessarily physically excludable. Or there may be good reason for exclusion by design. 9 Other spaces may be open to all, but governed by pricing – as with road pricing, paid-for facilities within parks, museums and so on. Others, like malls, may be provided free to all who obey private behavioural rules and financed from private land rent. Equity issues (exclusion of certain groups) can be dealt with in various ways including subsidy.

8 A Magistrate’s ruling over a pub’s licensing hours is one approach – an allocation of property rights over a contested space can be decided in the courts by judges. It may also be decided by administrators backed by the law who design bye-laws proscribing certain types of behaviour in public and appearing on public notices. Entrepreneurs and the professionals that work for them may also allocate rights to public spaces. Urban designers and architects do this when creating a scheme that attempts to harmonise users and maximise opportunities for positive interactions and minimise opportunities for negative interactions. Lawyers drafting the constitution of a proprietary science park do much the same. They are institutional designers attempting to avoid conflict over shared space and other resources by careful contractual design.

9 Most people accept the need for front doors on homes and for security desks in commercial buildings in order to prevent over consumption of private space (by intruders). If residents of a housing estate wish to invest in their shared public domain space they should perhaps be able to form a firm and have the same right to protect their assets by appropriate exclusionary devices. In this respect it should be noted that having the power to exclude does not necessarily mean that exclusion will be exercised. What matters is the ability to control consumption and to avoid the degradation of an open space. The difficulty with this idea seems to come mainly from an underlying and little debated assumption that all open space should be open to all.
A city with a hierarchy of open spaces delivered as a set of carefully designed and governed club spaces would be a more efficient, liveable and sustainable one. We are accustomed to thinking in terms a hierarchy of open spaces in the physical and functional sense. This paper challenges readers to think about a hierarchy of open spaces in the institutional sense – which institutions can most effectively govern different kinds of physical and functional spaces?

The micro-urban dynamics of public space

Economic theory gives us some useful conceptual categories for discussing the supply of urban public space. A public good is classified as such on the basis of its consumption characteristics – being jointly consumed, capacious (in infinite supply and undiminished by any one person’s consumption) and non excludable. A local public good is a collectively consumed good for which demand (usage) falls off with distance. Most civic goods and all public spaces are local public goods. They are enjoyed principally or exclusively by those living within a certain distance. A pure public good is a good co-consumed by a very large number of consumers. World-famous city squares like Piazza San Marco in Venice are like this. Millions of people scattered across the globe value Piazza San Marco because they have visited it, they hope to visit it some day or they derive a certain amount of satisfaction simply by its existence. It has local public-goods characteristics since the number of visits an individual makes to the square is correlated with the distance travelled. However, the ‘existence value’ and ‘reservation value’ have pure public-goods attributes. Consumption of these benefits is non rivalrous – any one person’s valuation of its existence does not reduce the amount of the square available to others.

By contrast, urban space can be classed as a pure private good if it is consumed by one individual, whose consumption renders it unavailable to others. A garden attached to a house has acquired some of the characteristics of a private good. It has been enclosed and once an individual acquires property rights over it, the right of others to freely use the space is removed. Few urban spaces are purely public or purely private, however. A garden would have to be enclosed from view and insects and consumed by a single recluse to make it purely private. So long as its flowers are pollinated by and provide food for someone else’s bees or it adds to the view from neighbouring properties, then certain of its attributes are jointly consumed.

10 Defined as rules and sanctions.
11 Mathematically, $n = f(d)$ or $n$, the number of co-consumers is some function of distance. Or alternatively, $d = f(n)$ – demand is a function of distance. The degree to which number of visits to a public space falls with distance is like a spatial demand curve, with the cost of access representing price. Beyond a certain distance the cost of access exceeds the benefits and consumers drop out of the market for that space.
12 $n = \infty$. 
Public goods can be provided by private suppliers and private goods can be provided by the state. Many of Britain’s great urban parks were originally supplied privately by wealthy families. The pleasant and reassuring environment of a wealthy suburb is mostly privately supplied by individual home owners investing in their houses and gardens and maintaining certain behavioural norms. Shopping malls provide a private version of the high street, supplying weather-proofed and privately financed public recreational spaces on privately owned land. State-provided social housing, by contrast, publicly supplies private space to individuals.

Of themselves, the categories of public and private goods are of limited value. More powerful is the idea of the public domain. A public domain may be defined as a sphere of resource consumption within which consumption rights remain unallocated (Alchian and Demsetz, 1973; Barzel, 1982; 1997). If theatre tickets are all one price, the public space within the theatre is not graded and its ‘quality’ attribute remains in the public domain. Where demand is high, theatre goers will adopt their own strategies for capturing the public domain resources of viewing angle and height and comfort. As well as queuing, they might arrive early to get the better seats, camp overnight, fight or devise their own allocating institutions. If the quality of seats is sufficiently variable and theatre goers find it too costly to engage in non-price competition, then the theatre is likely to assume the cost of grading seats and charge theatre goers for the administrative and technological costs of so doing. So long as the theatre space is potentially congestible (more demand for good seats than supply), then rationing by price will help achieve order and reduce the costs of competing for better parts of the auditorium.

Mechanisms of allocation change according to levels of congestion. When fuel runs out at the pumps at a time of crisis, price is no longer an efficient mechanism. Queues develop as a spontaneous ordering device—based on the temporary and unplanned acquisition of rights to space in the queue. Queues work well with low levels of scarcity. As the stakes get higher, queue-allocated rights easily slip into the public domain. If queue space is taken without following the rules, order can quickly become unstable and if the individual cost of enforcing etiquette is too high, order turns to chaos.

Before the game was thoroughly organised as a spectator sport, football supporters typically organised the allocation of space at a football ground by club affiliation and various rules. At a school-level Saturday morning football match, parents self-organise viewing space, taking one side each or capturing the space behind the opponents’ goal. In the days of patronage, peers and peasants, the front pews in England’s churches were customarily reserved for the gentry and more important members of the parish. Whenever shared space is repetitively used, customary patterns of use emerge (students always sitting in the same seats in a lecture theatre; Hong Kong maids of different ethnic origin gathering in different public spaces on their day off; partitioning of Beirut’s corniche by sect and faction; and so on). When these informal institutions become inadequate devices for allocating space between competing users, they will change, typically being replaced by more formal regulations.

‘Gazumping’ in property markets (accepting a better offer after a deal has been agreed) is rather like a queue breaking down—it represents a breakdown in the social conventions that govern voluntary exchange.
Drawing together and extending points already made, three important dynamics of public domain space may be identified – level of congestion, separability of the attributes that contribute to value, and ownership. The interrelationships between these three affect the stability, quality and sustainability of urban public space.

**Congestion**

The degree of competition within a public domain (congestion) is a function of the quantity of the resource (or its capaciousness), the numbers of individuals who jointly consume it, and the range of preferences of those individuals. If a shared resource is not congested, it can be said to be efficiently supplied. If congestion generates excessive costs – of queuing, avoiding conflict, resolving conflict and so forth – then there is likely to be pressure to reform property rights and subdivide the public domain into either private domains or smaller public domains. The former happens whenever land is subdivided to provide living space for more individuals, for example, the demolition of a large house to make way for an apartment block. The latter happens when the use of a shared good is reorganised, for example, when a congested recreational lake is allocated to different users by time and location zones or by tickets and pricing or by the outright banning of certain uses.

**Separability of attributes**

If it is cost effective and technologically and legally feasible to separate the rights over theatre seats according to quality of upholstery and clarity of view, then this may help resolve a problem of unrestrained competition, as we have seen. If it is feasible to create separate ownership of flood damage risk to a building, of use rights to separate floors of a building, or of rights to use different parts of a lake or public square, then with sufficient demand these rights are likely to be established. The right to access the Victorian greenhouses standing in some of Britain’s open-access urban parks is typically charged for. This is because it is technologically, legally and financially feasible to make these parts of the park excludable. Rights pertaining to different attributes of a lake (recreational space for wind surfers, transportation route from one side to the other, habitat for fish, power boat racing venue, premium water-front real estate, and so on) are likely to be separated and allocated to various groups where the benefits exceed the costs of establishing and policing the rights. Some rights are allocated by price, some by administration and regulation, and others by convention and voluntary exchange. The ability to separate the rights to various valuable and congestible attributes of an urban space is the first step to good physical and institutional urban design. The exercise determines a set of feasible design and governance solutions.

15 The method of development currently preferred by developers in congested South-East England.
Ownership

The governance of a public-domain space should be thought of as a design parameter, which like other aspects of design needs to be aligned with form and function. Here we return to the idea that cooperation between individuals can be organised either by central planning or by decentralised bi-lateral transactions – by hierarchy or by market. Is a particular public domain space best organised by a public entity or a private one? Is it best left unorganised? Is the shared domain designed with a specific ‘public’ in mind or has it evolved spontaneously over time? If the latter, what provision needs to be made for changing tastes, demand and conflicts? Is it under threat from numbers and preferences that are inconsistent with its carrying capacity? The penultimate section considers alternative governance models.

The interrelationship between contestability, attribute separability and ownership is illustrated in Figure 1. Category D open space has attributes that are non rival and non excludable. Parliament Square in London, like Piazza San Marco, yields benefit to a dispersed population that do not congest with the size of that population. All cities have similar spaces – Cardiff Bay, the redeveloped dockland of Wales’ capital, confers civic pride and economic benefits ubiquitously throughout the city and its travel-to-work area. It also confers more localised benefits to land users in close proximity.

Over time, some of the public spaces in Cardiff Bay will become congested by rising visitor numbers and increasing housing densities. The consumption of some spaces will become rivalrous as a result. At peak visitor time, the pedestrian walkways around the quayside are already as crowded as London tube platforms at rush hour. Competition for the surface of the 500-acre freshwater lake at the heart of the Bay is growing – from two sailing clubs, various wind surfing and canoeing clubs and boating events. Competition over noise, view, water quality and wildlife is increasingly intense. Many of the Bay’s attributes will move from cell D to C in Figure 1. They are spaces that may have been designed physically and institutionally to be non excludable but they are becoming subject to rivalrous consumption. Since people are willing to travel to recreate and open spaces in cities are generally scarce, it is reasonable to assume that most non excludable space of any value in cities, apart perhaps from the rare examples of very large urban parks, is in category C. Even in very large urban parks,

16 Localised benefits associated with the living and recreational value of the Bay are capitalised in land values, which fall off sharply away from the water front. The ubiquitous benefit associated with the Bay’s reservation and existence value may well be capitalised in land values but are less discernible because people value these attributes of the Bay far less than they do the sea views and superior living environments of the waterside homes.

17 11 million per year in 2004 and rising.

18 The latest site to be developed has the tallest apartment blocks so far, at 26 floors.

19 Midges breeding in the freshwater and plaguing the expensive homes is the latest manifestation of the people versus fauna debate that started when the Cardiff Bay Development Corporation first proposed reclaiming the bird-rich mudflats of the Taff and Ely estuaries.
the access points and special interest spaces will be rivalrously consumed.

Category C open space is, by definition, under stress. Its supply and demand is not balanced. It is inefficiently supplied in the sense that there are gains to be made from reorganising its institutional and physical design. To address the problem, the organisation charged with governing the space (it may be in private or public ownership) needs to consider alternative means of constraining competition between consumers. This will involve reducing the excess demand problem to its component parts and devising different mechanisms for allocating different attributes of the facility. Hawkers on the pavements of a low-income city might be regulated to limit numbers and certain types of activity such as banning food preparation. An outright ban is inefficient since hawkers provide valuable services to pedestrians. But too many of them can congest the walkways. There is, in theory, an optimal number and mix of hawkers for any particular street. Alternatively, hawkers might be charged as a means of controlling numbers. If the cost of hawking goes up, the numbers go down. If the price of a pitch is high, the numbers may fall too low and the street loses an important economic function, with knock-on effects in the local economy. The governing organisation might choose to directly employ hawkers to deliver a choice of services to its liking. A physical design solution may be needed to accompany such measures – allocating regulated spaces for hawkers, putting them in mall-like buildings as the Singapore government has done. The object of such measures is to create categories B or D open space (the choice of B or D typically but not necessarily depending on whether land is public or privately governed).

Category B open space may also fall out of equilibrium, however, if the institutional and physical design does not produce the expected behaviour or if the numbers

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Fig. 1 The evolution of urban space from public to private domain
and mix of users changes. Private gym clubs, toll roads and local spaces rationed by distance can get too crowded. This tends to result in a progressive delimitation of property rights and a fragmentation of ownership that has a physical correspondence in the densification of economic activity and land use. Returning to the hawkers, the assignment of individual rights to a ‘market pitch’ is the first step in moving from categories B to A – of part-privatising the street. Hawkers allocated to specific spaces on the street by a mixture of price, regulation and design acquire rights over the space they occupy, which becomes private space (category A) for the duration of their occupancy. Street congestion is tackled by taking space out of collective consumption and turning it over to private consumption. The solution involves a movement from C to D for most of the street and C to A for parts of the street. If hawkers are offered a permanent home in a privately governed space, then the solution will also include a move from C to B. The story is repeated on all land within a city, as the sketches in the next section illustrate.

**Sub-division stories**

**Welsh Winter-wonderland**

In recent years, seasonal open-air ice skating rinks have appeared in British cities. For three months of the year, about a third of an acre of the lawn in front of Cardiff’s neoclassical city hall is covered by a large tent, a rink, various stalls, rides, a bar and café. This has proved a more valuable use of the grass during the winter months. Such is its value that a different set of rights are necessary to govern its use. Small lots are allocated to vendors by price (rent), rendering some of the lawn class A private space. The ice rink itself is enclosed, with access charged for. It is not a private good, however, since the rink is shared equally by those skating in any of the one-hour sessions. It is a class B club good, organised by a partnership of the local authority and specialist entertainment firms. It is a congestible good and because of this it is enclosed (an institutional and physical design decision that keeps it out of the class C bracket). The local authority could have supplied the rink in the same way as it supplies the lawn (which is densely used in the summer as a sitting area) – free at the point of use and paid for from general tax revenue. This would have led to congestion, however, and congestion on an ice rink is particularly costly to individuals and to the organisation liable for personal injury claims. However, enclosure on its own would not prevent over use. The rink would become unusable at peak times and people would adopt spontaneous rationing strategies such as queuing and rearranging schedules to use it at quieter times.20

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20 Over time, if knowledge spread rapidly enough (unlikely given the wide spatial catchment of the facility and the infrequency with which any individual uses it) then demand may spread more evenly to avoid degradation and devaluation.
organisers sensibly adopt time rationing with capacity constraints. In this way, the space is organised as a well-managed club good, numbers being aligned with the capacity of the space. The number of disappointed skaters turned away from the ticket office provides valuable information about demand and offers the possibility of extending the facility. Physical design constraints allowing, there is no reason why the whole of the lawn should not become organised as a club good for a quarter of the year. The number of summer enclosures of the same space for open air concerts is increasing and the summer picnickers on the open-access lawn have become just one set of ‘time-share’ users of this valuable piece of city centre land. If there were congestion problems with summer crowds (these are not great at present but are worsening), the lawn might be enclosed permanently, rendering it more easily managed and financed by users (rather than by every tax payer in the city, most of whom never use it personally).

Paris Plage

A similar story can be told about Paris Plage: 21 250 tons of sand spread along two miles of the Right Bank of the Seine. However, the difference there is that most of the two million euros cost is covered by corporate sponsorship and the area is not enclosed. This is only partly due to France’s commitment to municipal socialism. It is also due to the physical impossibility of enclosing such a long, thin space (just a few metres wide for most of the two miles). 22 It should be noted that even this free-access beach is provided at a cost to the public realm – sponsoring firms are given private property rights over advertising space within the beach (principally via special events). This is a small price that does not reduce the value of the facility for users, making it a highly efficient (and smart) institutional design. Although the deckchairs are currently free, as the place becomes more popular, congestion will bring a need to assign rights more carefully and within a year or two there are likely to be Mediterranean-style beach rent collectors allocating shares to the beach by price (via chair ticket). In time, the authorities are likely to find cost and quality advantages in franchising this service out in much the same way as the food kiosks further along the Seine near the Eiffel Tower. As the beach gets more crowded, property rights are likely to fragment further, with private lounging enclosures where this is feasible and more specialised spaces for sports and an extended and differentiated range of eating and drinking

21 Berlin has its (larger) Ostrand beach on the Spree near the Reichstag. London will get one eventually – in 2004, Southwark Council short sightedly refused permission for a Bermondsey Beach on the Thames.
22 The 28-metre swimming pool introduced in 2004 has a nominal charge, demonstrating that the Paris authorities do not have an aversion to enclosure and cost recovery where this is technically feasible.
23 The underlying purpose of the Plage is to attract tourists to spend more time and money in the city centre (improving the centre’s ability to compete with Disney Land).
Each part of the plage will have its own institutional arrangement, progressively shrinking the public domain rights toward a stable minimum.

New York’s niches

Some public spaces have emerged over centuries as a result of an awkward geometry or an unpropitious geography. They may have been rendered inaccessible by path-dependent development pattern or they may have been blighted by a former use, hallowed by religious belief or iconified by popular use. Spaces imbued with socio-cultural significance can acquire a self-reinforcing importance so long as their popularity does not lead to congestion and demise. Broadway in New York started off as a trail used by native Americans and gradually developed into a major road connecting lower Manhattan to Harlem (Shuffield, 2004). When the northern half of Manhattan was transformed by the Commissioners’ Plan, Broadway, diagonally cutting across the grid, was to be removed. However, re-engineering a street topology that had evolved around this strong axis of communication and identity would have encountered formidable technical and political problems. Broadway survived and its intersections with the rest of the city’s right-angled streets produced a number of awkwardly shaped land parcels. Several of these survived the intense development of the island and became New York’s best-known public spaces including Times Square, Herald Square and Madison Square. Similar spaces can be identified in all towns. At some stage technological innovation and legal developments may render such spaces suitable for development so that they succumb to the process of subdivision. Where de facto public use rights are strong enough to resist, another kind of proprietary subdivision typically occurs – nearly every three-dimensional inch enclosing Times Square is divided into advertising space, rights to which are allocated by price. The class A private spaces on the building sides and the class D and class C public space below feed off each other in productive ways that enhance the total value of the Square.

Urban public space, as with all space (and all resources) inevitably fragments physically and proprietarily in search of additional value. This happens as entrepreneurs (working for private or public organisations) search for new opportunities for enhancing the value of assets. The evolutionary path is towards a residual public domain or a minimal public sphere. Figure 2 shows how the sub-tropical vegetation

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24 Already by 2005, local residents and users were organising their opposition to the use of the beach by suburban residents. France may well look for a typically French administrative solution to the impending congestion, but it is difficult to see what system could improve on the simplicity, efficiency and equity of deck chair charges.

25 That is not to say that public domain space is never enlarged. Many city-centre pavements have been widened and streets pedestrianised in the neo-traditional urban projects of the past two decades (see Hebbert, 2005 for an excellent discussion of such trends). These are organised attempts to raise the capacity of urban spaces beyond a threshold that will sustain qualitatively different users and values. Once a street is pedestrianised or widened, the
surrounding the rocky outcrops of Hong Kong Island have succumbed to development as building technology improved. Open-access rights tend to shrink in spatial extent until they cover only the spaces which can only (at any particular point in time) function under this institution. Cardiff’s ice rink, Paris Plage and Broadway’s Squares illustrate this. The process is also obvious on the roads of any city. Bus lanes enclose a portion of road space for the exclusive use of one category of user (creating a class B space), leaving a residual amount of road space for open-access use by private-vehicle owners. The space allocated to private transport, public transport and pedestrians is all residual space in the land development process. Once constructed, residualisation and rights fragmentation proceed up to some minimalistic allocation given the prevailing technology and pattern of demand.

Fig. 2 Building technology renders residual open space in Hong Kong suitable for development: shrinking the stock of public-domain land towards a minimum.

process of residualisation kicks in, with rights to its various attributes allocated in a way that tends to maximise its value to dominant stakeholders.
Tragedy of the urban commons

The matching of supply and demand of space in each category of Figure 1 is not guaranteed. There are many metaphors useful for understanding the problem. The predominant one during most of the twentieth century has been market failure – the market is said to fail in the efficient provision of public goods because of information problems and the problems of organising collective action. It may not supply at all if everyone free rides or it may undersupply if individuals fail to reveal their true willingness to pay. The insight is much older than the sophisticated public-goods theory of modern neo-classical economics:

Two neighbours may agree to drain a meadow, which they possess in common; because it is easy for them to know each other’s mind; and each must perceive, that the immediate consequences of his failing in his part, is, the abandoning of the whole project. But ’tis very difficult, and indeed impossible, that a thousand persons should agree in any such action; it being difficult for them to concert so complicated a design, and still more difficult for them to execute it; while each seeks a pretext to free himself of the trouble and expense. And would lay the whole burden on others. Political society remedies both these inconveniences. (David Hume, [1739–40] 1978, 538)

A tragedy of the urban commons unfolds as too little public space is created. Everyone wants more (or better) open space and is willing to contribute, but in the absence of a price mechanism demand is not met with suitable supply. We can call this a Type I tragedy – land is over developed to the detriment of all. Cities are built at inhuman densities and urban land is ‘over grazed’ because of a lack of effective mechanisms to reveal citizens’ true preferences for open space and other environmental goods. The problem is not one of individuals’ unwillingness to pay for more open space (or lower density) but a problem of information and coordination. The undersupply of urban design (as a professional service) is a Type I tragedy of the commons. All stand to benefit but the property development and house building industry tends to undersupply urban design because it is not efficiently priced.

A second type of tragedy unfolds on whatever public domain spaces have emerged in the course of a city’s development history. The biologist Garrett Hardin put it this way:

26 In the UK, the house building industry and government planning regulators have unwittingly conspired to undersupply good architectural design of private space. Two contributing causes of the atrocious space, design and building material quality of mass produced homes built in the UK since the Second World War are first, the restriction of building land resulting from restrictive planning policies and second, the market power of the mass house builders, which put together with the restricted land supply has allowed them to get away with selling poor products.
As a rational being, each herdsman seeks to maximise his gain. Explicitly or implicitly, more or less consciously, he asks, ‘What is the utility to me of adding one more animal to my herd?’ This utility has one negative and one positive component.

1. The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1.

2. The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decision making herdsman is only a fraction of –1. (Hardin, 1968, 115)

Individuals tend to make choices about how and when to use open space without regard for their own contribution to its degradation. The latter effect is usually too small to be perceived. Even if it is perceptible, the fact that it is shared by many others means that individuals feel absolved of personal responsibility. The quantity of grass eaten by one more animal is unavailable for the individual farmer’s herd the next day, but if the reduced grass area is shared by 100 farmers, the effective cost is the total area remaining divided by that number. The herder can choose between a day’s worth of feed now or the loss of a day’s worth of feed/100 tomorrow. The same calculus applies to drivers’ use of public roads, graffiti artists’ consumption of clean walls, those littering in public parks, tourists in historic town squares, skate boarders damaging public monuments, and citizens who impose everyday wear and tear on public infrastructure.

The current state of Britain’s suburbs illustrates Type I and II tragedies of the urban commons. Large parts of British inner- and suburban-city neighbourhoods are degraded by over use and underinvestment (SEU, 1998; SEU, 2001; ODPM, 2000; 2003; CRU, 2003; Green et al., 2005). Over 80 per cent of England’s population live in suburbs. Created by successive waves of mass house building made possible by innovations in transport technology, these have long been ignored in urban policy. A recent series of research and policy reports show that all is not well (Gwilliam et al, 1999; Hampshire County Council, 2002; Civic Trust, 2005; GLA, 2005; URBED, 2004). Although many suburbs work well (particularly those inhabited by the more wealthy), there are many suffering from environmental degradation; underinvestment in shared goods and services; poor access to public transport; poor access to local commercial services; declining sense of community; public-order problems; poor schools; underinvestment in private housing maintenance; underoccupancy of housing; inefficient use of space with too much poor quality open space and houses at relatively low densities; and problem estates suffering from enduring multiple deprivation. At the heart of the problem is an inappropriate ownership model. The state owns everything in between the freehold plots sold as category A space but does not have sufficient incentive or capacity to maintain adequate investment in this shared space.
If a tragedy of the commons can be explained by the individual behaviour of many consumers, its rectification requires coordination. The following section considers alternative coordination models.

**Diversifying ownership of open space**

The institutions governing open space in cities are much more diverse now than 50 years ago. This is so throughout the world in countries at different levels of development and with very different political economies (Webster, 2001; Webster et al., 2002; Webster and Lee, 2005; Webster, 2005). Over 54 million people in the USA now live in neighbourhoods where open space is supplied and governed privately via incorporated Home Owners Associations and the number is rising rapidly (McKenzie, 2005). Between 1991 and 2000, 83 per cent of residential communities built in Shanghai were gated (Su, 2000, quoted in Qu, 2005). Virtually all new private housing in China is supplied as club neighbourhoods – constructed as estates with privately supplied open space and neighbourhood facilities and managed by private management companies employed by residents (Webster et al., 2006).

Faced with a problem of a degraded and polluted wetland open space in central Bhubaneswar city in Orissa state, India, the city government partnered with NICCO Parks and Resorts Ltd to turn it into a regional leisure facility. Enclosure of the area reversed the tragedy of this urban common, resulting in private sector financed investment that gave the city a high-quality and popular open space. Poorer residents downstream from the wetlands benefited from the waste-water purification plant built by the leisure company.

Malls have become a standard feature of most cities, providing high-quality comfortable recreational spaces and providing healthy competition to the conventional shopping street. Contrary to some anxieties, many malls provide a richly heterogeneous mixing ground for different income groups. The same thing is happening with children’s parks in many cities – entrepreneurs having discovered that parents of all income brackets are willing to pay for quality indoor play space. This may not replace outdoor play facilities or private play space but widens choice. Diversifying the institutional and physical design of children’s spaces achieves gains from trade that benefit parents, children, entrepreneurs, investors and land owners.

Following the retreat of the Roman colonists, land in North Africa that once grew grain for the Empire gradually lost its productivity and eventually succumbed to desertification (Bottomley, 1963). The land degradation was associated with the removal of private property rights (franchised farming) and the ensuing lack of incen-

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27 Venkateswaran Sandhya (2004) Wastewater and Recreation Park – case study of pro-poor public–private partnership, Bangkok – UNESCAP Poverty Reduction Bureau – I was a member of UNESCAP’s project advisory group that commissioned this case study.
tive to re-invest. When a scarce resource is enclosed, its quality can be more easily preserved. With man-made resources, enclosure limits the rate of depletion and encourages investment. When access to the ‘public realm’ of a neighbourhood is a right owned by the entire city population, limited only by cost of travel, then urban green space, roads, pavements, alley ways, squares and public services suffer from unrestrained competition. This includes competition between groups with conflicting preferences and overuse by consumers with similar preferences. Effective management of unstructured, unrestrained demand, including conflict resolution and re-investment – a complex collective action problem - is generally thought to be possible only through public government. The frequent result is inadequate management and investment and solutions that play to the median voter, the wealthier groups and powerful lobbies. Open access space in neighbourhoods within easy reach of dense populations, especially poorer populations, tends to degrade, therefore. High investment in public regulation and policing cannot always stop this (as the example of Britain’s city-centre, late-night clubbing externalities shows).

Enclosure of congestible resources not only helps limit usage but also creates an incentive to discover creative resource preserving and enhancing solutions, including those that internalise externalities. Enclosure need not necessarily mean physical enclosure. The important issue is legal enclosure that enhances the rights of those within to control the use of a shared resource. Clarifying the allocation of property rights among co-consumers gives incentives to preserve and invest in open space. With co-ownership comes a greater degree of control and a higher probability that investments will yield increased utility (or revenue in the case of commercial interests). With open access and public ownership, individuals or organised sub-groups of co-consumers have little incentive to invest in capital or management infrastructure or to act with individual prudence since they cannot usually be sure that the benefits will not leak away.

The right to exclude is also the right to include and the power to enhance local public goods is also the power to be wise, prudent and generous in decisions about who uses them. Many mall owners and management companies take pride in fostering the communities of customers that use their private high streets. Owners of controlled-access play spaces, indoor markets, leisure clubs, museums, swimming pools, condominiums and residential estates compete with each other in searching for service ideas and new facilities that will improve their users’ satisfaction (Chen and Webster, 2005). The grotesqueness of South Africa’s highly fortified residential neighbourhoods is softened in places where they are used as safe places for weekend walks by residents living in less secure places. Residents become suppliers of open

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28 It may even renew itself in the case of natural resources.
29 The class of voter, usually with non-extreme views on issues, who politicians effectively compete over.
30 Keynote paper presented at the international symposium ‘Territory, control and enclosure: the ecology of urban
space to other residents and the relationship fosters respect on the part of the visitors and neighbourliness and altruism on the part of the hosts.

Conclusions

Consider, finally, the role of the urban designer in a city of diversified open spaces. Far from being the death of urban design, a city of open spaces owned by a mixture of private, public and partnership organisations would mainstream the profession into a competitive creative industry. Good urban design is in the interests of land owners, developers and financiers as well as consumers since it raises the quality and value of a scheme. In a city where ownership of public space is centralised, good urban design is undersupplied. Design expenditure by any one developer or landowner is at risk if others, including the local government, do not also invest in the same quality of design. As with over densification it is a Type I tragedy of the urban commons. In such circumstances, the urban designer, like the urban planner more generally, can play a vital role in brokering a collective action solution that breaks the prisoner’s dilemma and results in everyone paying more for design – to overall private and social gain. However, the institutional frameworks in which design-led brokerage can break collective investment dilemmas are probably quite rare and urban design is all too often left as an appendage to the planning regulation function.

Where developers build fully functioning neighbourhoods complete with management and governance institutions, the collective action problems that degrade open space are more likely to be kept at bay. So long as prices signal the value of design, design of open space will be as essential to a packaged-neighbourhood market as holiday design is to the packaged-holiday industry. The larger the scheme and the lower the value of the existing land and surrounding land, the greater the potential private gains to developers from raising the percentage of production costs allocated to design. This may go some way to explaining the rise of urban design on the professional agenda in the UK in recent years – in the last decade or two, the development industry has found itself with largish sites in low value locations. Ironically, the biggest threat to an urban design industry vitalised by the competitive supply of club neighbourhoods and other forms of excludable open space, is over regulation. The poor design of many of Britain’s mass-house-builder estates of the past half century must be partly attributed to a degree of monopoly power in the industry; local spatial

[fragmentation], CSRI, Pretoria, South Africa, 28 February–3 March. Published as Webster, C. J. (2006), Territory, Control and Enclosure [available at: www.cf.ac.uk/cplan/chris/cgi/ram.html].

31 There may be occasional horror stories of tour operators acting opportunistically or just incompetently but by and large, competition keeps quality high. Oligopoly and cartel-like behaviour compromise well-designed holiday packages and this is a potential problem in the development industry of many countries, especially those with strong regulation.
monopoly power made greater by state-restricted land supply; the monopoly power of local planning authorities over design control; and state monopoly power over the governance of open space. The more diverse the institutions of open space provision, the greater the competition between suppliers and the more diverse, interesting, useable, sustainable and better governed will be the shared spaces of our cities.

The point about the social costs of monopoly behaviour is a suitable one to end since it raises the issue of power. The paper has purposefully avoided discussion of legitimacy in decision making in order to deliver an uncluttered positive theory of urban public space. The processes of congestion, property rights reassignment and residualisation that I have described are, of course, driven by individuals and groups with varying degrees of access to power and other endowments. The evolution of public-domain space is influenced by patterns of market, government and individual power. Abstracted from the realities of such power, the theory might be criticised as being overly hermetic – spaces get congested; ownership changes; open space shrinks; conflicts diminish until changing demand introduces new congestion. Adding the realities of unequal power makes this no less hermetic, however. When open space is under the control of a monopolistic government, developer or land owner, rights of access are unlikely to exhaust gains from trade and the space will be supplied inefficiently in this sense. If a shopping mall in a small town is the only provider of an all-weather, managed shopping environment, its owner may act opportunistically by keeping rents high, underinvesting and underspending on management. Theoretically, it will be able to do this to the point at which shoppers are indifferent between using the mall and shopping elsewhere in the town or beyond. Its unopposed market power allows it to appropriate all the consumer surplus – the premium shoppers and retailers are willing to pay to use and operate within the mall. If a second or third mall were permitted to operate in the town, mall owners would have an incentive to share that surplus with customers and retail tenants and the open spaces in the malls would increase in quality.

Where is the scope for uncertainty and creative and capricious human agency in this deductive line of reasoning? One way of answering this is to say that where there are sufficient incentives, human agencies – entrepreneurial individuals, firms and governments – will be forever on the lookout for new and creative ways of rendering open spaces more beneficial. This is the role of the urban planner and urban designer. The problem with a municipal government monopolistically supplying open space (or open-space quality control) is that the incentive to innovate is dulled (as with the monopolistic mall supplier). Diversification of the agencies and institutions supplying open space is likely to increase quality and diversity through competition. It is also

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32 I am grateful to an anonymous referee for allowing me to address this point.

33 All deductive theory is, by definition, hermetic in the sense of being a model that consciously abstracts from certain realities. However, it need not be deterministic.
likely to result in the discovery of a more effective alignment between the rights of shared-space consumption and the responsibility of territorial governance.

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Property rights, public space and urban design

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Acknowledgements

I am grateful to Edwin Buitelaar, Barrie Needham and John Punter for their comments on the first draft of this paper. The paper was inspired by discussions with Andrew Dakin, Christine Mady, John Punter and Gloria Visintini and by the peerless prose of urban-design historian Michael Hebbert.