Greenways and the making of urban form

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Abstract

One aspect of greenways which is exciting popular interest in the US is the durability of nineteenth-century parkways and park systems to stitch together fragmenting cities and urbanizing areas. What the Olmsteds, Cleveland, Eliot and Kessler achieved in their regional open-space plans can be the model for a new version of Howard's 'town/country' in which greenways/greenbelts/greenspaces together make a comprehensive 'green' infrastructure.

Some of the literature and the highlights of historic greenway planning and design in the US are reviewed. Their adaptation to current projects is illustrated through a series of case studies of gradually increasing scale—villages, towns, cities and regions. Such common strategies as 'green' streets, parks and playgrounds structuring walkable neighborhoods, intra-neighborhood parkways connecting town/city districts, and regional park systems protecting natural areas for recreation/conservation still confer similar social, economic and environmental benefits. Whether Pedestrian Pockets or Co-housing, expanding historic settlements or preserving the countryside, planning new 'urban villages' or neo-traditional towns, greenways can be powerful makers and shapers of urban form at both macro- and micro-scales.

Keywords: Greenways; Landscape history; Town and country planning; Urban design; Regional planning

1. Introduction

Greenways as a formative device for stitching together fragmenting cities and their urbanizing hinterlands is attracting widespread attention. Environmental groups are supportive of the idea for preserving natural habitats, native plant communities and wildlife corridors. Planners, urbanists and landscape architects see it as a way to bring order to spread-out suburbs and rebuild inner-city neighborhoods. Community activists are attracted by the egalitarian aspects of equalizing open-space access for the greatest number of people. City and municipal officials regard the greenway concept positively, since it stands to improve the image of their communities, attracting new development or investment and hence creating jobs and tax base.

In the US, interest in greenways was stimulated and given prominence by the President's Commission on Americans Outdoors (1987) which amongst its central recommendations advocated as a "A Vision for the Future: A Living Network of Greenways ... to provide people with access to open spaces close to where they live, and to link together the rural and urban spaces in the American landscape ... threading through cities and countrysides like a giant circulating system" (p. 102). This compelling image reflected the 'can-do' mentality of its authors in the best tradition of American idealism and pragmatism.

The message was taken up in a canonical popular work by Little (1990) entitled "Greenways for America". It was both a text and how-to manual for the emergent greenway movement. The roots of the word 'greenway' were explored (a combination of 'green-
opposite points of view about greenspaces in development. In one, new housing was planned around existing roads and country lanes, converted into park-like pedestrian streets in the early phases and a combined walkway/public transit system in the later phases: a community route concept (Fig. 1(A)). In another, housing was planned around a substantial multi-use park of around 50 acres (20 ha) preserving major existing landscape features, with a cordon of buildings and perimeter streets: a superblock (Fig. 1(B)).

Hough (1984) argued that a better understanding and application of natural processes (climate, water, plants, soils, wildlife and food-growing) could shape a more productive and sustainable design form for the modern city. For examples of ecologically-driven form evolving from ‘natural determinants’, he cited a campus landscape (Calgary), a lakefront park (Toronto) and a city open space system (Stuttgart), an integrally planned network of river valley parks and working landscapes on the valley sides, making it “among the most climatically functional, socially useful and aesthetically pleasing of any modern park in the Western world” (Hough, 1984, pp. 49–64). Later, his new urban design strategy for more productive and diversified city landscapes emphasized—besides parks, institutional grounds and converted derelict lands—multi-use streets. Like Dutch woonerfs and North American studies of street-use in low-income inner-city neighborhoods, streets were the primary social place for people, besides being space-intensive, occupying upwards of 40% of the total available land (Hough, 1984, pp. 251–253).

For these or other greenway models to make or shape urban form, planners need to get ahead of urban growth, not react to it. Conventional growth-shaping tools (such as overlay zoning, special districts, conditional approvals with covenants or deed restrictions, tree-protection ordinances, land trusts, Transfer of Development Rights, etc.), used separately or in concert, can go a long way, but only partly steer and guide development (President’s Commission on Americans Outdoors, 1987, pp. 161–162). The majority of greenways presented in Little were residual leftovers after development—natural corridors and abandoned railroads, canals and other rights of way. These should not be disregarded because no longer ‘needed’. They are useful in other ways—because of their continuity, linearity, reticulated patterns maximizing their edge influence, and low acquisition costs (Little, 1990, pp.
Fig. 1. Two opposite points of view about greenspace-making in British New Town housing. (A) David Gosling et al., community route concept for Western Gailes, Irvine New Town, Scotland, 1971 (Gosling and Maitland, 1984, p. 91). (B) Richard MacCormac and Peter Jamieson, superblock housing at Duffryn, south Wales, 1979 (Gosling and Maitland, 1984, p. 90).
33-37). More importantly, because neglected, most of them are ecologically rich in local flora and fauna expressive of the region and not overlaid by "biologically sterile manmade landscapes" (Hough, 1984, p. 133).

Pieced together, residual lands could make a partial green framework; but additional links are needed to make a comprehensive system. These 'make-up' connections rarely relate to natural features or ecologically-derived criteria. They have more to do with historical, cultural, functional and/or political factors—ridgeways, transportation crossings, city and town lines, planned routes, and other human interventions which have influenced desire lines and destinations impacting urban development. It is these 'green' extensions which complete a metropolitan greenway system—be they waterfront esplanades, bicycle paths, tree-lined 'promenade' streets, pedestrian ways, avenues, boulevards or parkways. They make the essential connections from the predominantly built-up city, through the linear parks, trails and miscellaneous open corridors of the suburbs, to the real countryside beyond of agricultural fields and managed forests. (In the US, 'ecoforestry' is being advocated by the Ecoforestry Institute of the U.S., 1993, as an alternative to the current 'industrial forestry'.)

To the question 'Can greenways make urban form?' the answer is two-fold. There is a historic tradition of greenways (parks, parkways and park systems) shaping cities by laying out a pattern in advance of urbanization. This tradition may be revived and, with the rediscovery of the primary public space, the street (in all of its many possible forms—parks, squares, greens, closes, mews, courts, commons, crescents, avenues, etc.), could once again structure communities. The American mood, with its love-hate relationship to centralized planning and historic anti-urban bias, is not especially happy with the status-quo and of a mindset to consider alternatives. Greenways could be part of the new order, realizing the open space networks envisioned for reconnecting cities to their rural hinterlands and people to nature.

2. The historic contribution

The historic contribution of North American greenways is inextricably linked to Europe from which the colonists came. As forests were cleared and the wilderness receded, Dutch orchards, London squares, Paris boulevards and Spanish plazas were the Old World models adapted to the New. Principal streets, seaside promenades, bowling greens and public grounds were often bounded by avenues of full-grown native trees, such as Locust, Horse Chestnut (Castanea), Oaks, Tulip Poplar and Southern Magnolia (Hedrick, 1950, pp. 63-66). Park-like streets and squares guided Savannah's growth for 150 years.

By the 19th century and the onset of urbanization, landscape architects, architects and engineers functioned as incipient city planners. Frederick Law Olmsted (the American equivalent of Europe's Peter Lenne) invented the two basic greenway components—the stream valley park and the pleasure drive for carriages—in his 1865 plan for Berkeley, California (Little, 1990, p. 9). Olmsted and his then partner Calvert Vaux planned Brooklyn's Prospect Park (1866-1874) in the context of urban growth and the regional landscape (Brooklyn grew as an independent city to become the ninth largest in the US), with 200 ft. (60 m) parkways replacing 70 ft. (21 m) wide 'regular' streets, already platted. The idea was promoted less by aesthetics than for social and economic reasons—people would benefit from having parks and parkways part of their everyday experience, and promoters would find investment opportunities and homeowners enhanced property values around the parks or along the parkways.

By 1870, Olmsted's planning concept of parks and parkways structuring cities' growth was presented to the American Social Science Association as 'Public Parks and the Enlargement of Towns'. Parkways were to be "either narrow, informal elongations of the park, varying say from two to five hundred feet in width, and radiating irregularly from it ... (and) branched or reticulated with other ways of similar class, so that, no part of the town should finally be many minute's walk from some one of them: and they should be made interesting by a process of planting and decoration, so that necessarily passing through them, whether in going to and from the park, or to and from business, some substantial recreational advantage may be gained" (Olmsted, 1870, pp. 24-25). His Buffalo, New York, 1876 plan for a large country park (consolidating two pre-existing institutional grounds, a cemetery and an asylum), with parkways ringing the city and tying it to its waterfront, was entitled 'Park Plan—General Plan for the City'.
Fig. 2. The historic growth of a regional greenway system: Boston, MA. (A) Plan of a Portion of Park System from Common to Franklin Park, 1894. Olmsted, Olmsted and Eliot (National Park Service, Frederick Law Olmsted National Historic Site). (B) The metropolitan park system, 1902, as developed in accordance with Eliot’s plan (Scott, Mel, American City Planning since 1890, p. 22).
Olmsted, Olmsted and Eliot’s Emerald Necklace Plan for Boston and Brookline, Massachusetts (1879–1895) integrated parkways and stream valley parks based on distinctive regional ecologies, with the necessary overland route connections to make a system—joining the historic public grounds of the old city, Boston Common and Public Garden, by way of Commonwealth Avenue and the development of Back Bay, to the Necklace’s outward continuation to the country by way of the Arborway, Arnold Arboretum and West

Fig. 3. The historic growth of a regional greenway system: Kansas City, MO. (A) Plans at 1893, 1909 and 1915 (Annual Reports, 1914–1915, p. 16). (B) Ideal boulevard cross sections from the 1893 Plan (Annual Reports, 1893, pp. 30, 36).
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Roxbury Park, now Franklin Park (Fig. 2(A)). By 1902, the system had become one of the largest in the country (Fig. 2(B)). The Metropolitan District Commission was the first regional park authority in the US (Zaitzevsky, 1982).

The escalation of parks into park systems in the years after the Civil War up to the New Deal was a response to the steadily mounting stream of urban in-migrations fuelling cities' rapid growth (Dal Co, 1979). In the 25 years between H.W.S. Cleveland’s plans for Minneapolis (1883) and George E. Kessler’s Plans for Cincinnati (1907), many cities advanced comprehensive proposals for park systems—amongst them Louisville, Atlanta, Kansas City, Dallas, Denver and Indianapolis—which blended Romantic Park and City Beautiful ideals, inspired by the great European expositions and North America’s own Chicago World’s Fair, 1893. None was more complete than Kessler’s 1893 ‘Plan for Parks and Boulevards for Kansas City, Missouri’ on which he consulted for the next 30 years until his death in 1923, at which time the work was continued by others. The system kept pace with the city’s rapid
growth, by 1915 making a grid pattern framed by the Missouri and Kansas Rivers and their tributary valleys of Brush Creek and the Blue River, covering 60 square miles (155 km²) (Fig. 3(A)). "The boulevards and the east–west links tied not just the parks but the whole city together". From less than 500 acres (200 ha) of parks and 9 miles (14.6 km) of boulevard roadways in the 1893 Plan, the city had nearly 2000 acres (800 ha) and 90 miles (145 km) of roadways, in both boulevards and parks, in 1920, when the system had expanded very little since 1915 (Wilson, 1964, pp. 125–126).

The system included 100 ft. (30 m) boulevards with each side planted with two or three staggered rows of trees (the intermediate row serving as a tree nursery for subsequent planting elsewhere), some streets incorporating trolley cars (Fig. 3(B)). Others became double streets with linear parks in between: The Paseo (named after Mexico City’s Promenade de la Paseo) developed as the 9-mile (14.5 km) north–south spine, fixing the position of several east–west boulevards. There were neighborhood parks and playgrounds tied in with the schools (distributed throughout based on 10-min walk circles) and community parks, and one large regional park of 1700 acres (680 ha) for the entire populace, presented in 1896 as a gift to the city and which is still in the process of development a century later. The plan addressed the removal of blighted housing and its replacement with parks around which new neighborhoods could coalesce. Equally, it anticipated the lines of new development, laying out a framework for new planned communities, such as J.C. Nichols’ enormously successful Country Club District, begun 1907. Commercial development was to be excluded from the boulevards (and has since developed on parallel streets nearby), consistent with the plan’s neighborhood orientation and "to give a park-like effect and an appearance radically different from that of ordinary residence streets" (Walmsley, 1991a).

The plan was astonishingly comprehensive in its scope, combining environmental protection and natural resource preservation with scenic values (restoring the river bluffs, emphasizing the stream valleys); social ideas for building a stable, balanced and wholesome community (the neighborhood and school orientation); transportation needs ('trafficways' are still distinguished from boulevards and parkways); aesthetic notions for beautifying the city (with public gardens, pavilions, fountains, fine art and a regional "park architecture"); and a fair and equitable system for distributing the costs (through Park Districts and graduated tax assessments). It has survived to this day largely intact, though not wholly unscathed by modern freeways and Interstate highways, as a secondary intra-neighborhood movement system which services the entire city, equalizing recreation access for all citizens, irrespective of race, class or income. It has stabilized neighborhoods (many of which have been designated historic districts); encouraged community revitalization; and promoted new parkway building in three outlying counties, as well as a movement to introduce them into the central business district (which the original plan failed to do). It approaches the ideal of a "'giant green circulation system" permeating all parts of the city and its urbanizing hinterland (Walmsley, 1991b).

The low density, multi-center, spread-out city laced with greenways is one urban model of the future. Another, perhaps only a variant of the first, is a high density center city with a low density urban fringe organized into several satellite sub-centers. This option, associated with Ebenezer Howard and the birth of the English Garden City Movement at the turn of the century, and the American Greenbelt Towns of the 1920s and 30s pioneered by Garden City enthusiasts Clarence Perry, Lewis Mumford, Clarence Stein and Henry Wright, has dominated much city planning everywhere since the end of World War II (it is the model adopted by many European cities besides London—Stockholm, Copenhagen, Helsinki, Moscow, Paris, etc.). As originally formulated, these satellite towns were to be of limited size (1000 acres for 30 000 people, subdivided into six wards or districts), surrounded by a permanent greenbelt (5000 acres for 2000 people) and connected to other towns and the center city by rail lines. Conceptually, open space circumscribed the urban components of this system as effectively as medieval city walls had done. By fixing the size of the 'town' elements and preserving the integrity of the 'country', an amalgamation of both was promised, possessing all the benefits of immediate access to the countryside without sacrifice of city work opportunities, social stimulation and cultural diversion. Further, the 'country' elements penetrated the 'town' to form a 'green' armature for its districts: there was a 420 ft. wide Grand Avenue (separating work places from living places), secondary avenues, boulevards, a central park and a 5-acre (2 ha) public garden making a foreground for civic
buildings—a library, art gallery, theater, townhall, etc. (Howard, 1902).

As realized by Raymond Unwin, Barry Parker and others, the first garden suburbs and garden cities adhered to the bones of Howard's diagram, but greenbelts were never as large or as pristine as recommended; nor could they be maintained without the exercise of strong and continuous central planning. After World War II, planning legislation to facilitate reconstruction was enacted. Twenty years of British New Towns, however, did little to relieve the pressures to build in greenbelts; because protected, development leapfrogged over them to colonize the countryside beyond. In the United States, where centralized planning controls were politically unpalatable, the few greenbelt towns or parts of towns built before the war lost most of their greenbelts after it, in the suburban explosion that followed the ending of hostilities. But, the internal organization of the towns as traffic-free superblocks in response to the greater use of automobiles in America, introduced at Radburn, New Jersey in 1928, did survive and has exercised a pervasive influence on planning ever since. Large open park areas in the center of superblocks, joined to other parks by overpasses and underpasses at major street crossings, achieved a near complete separation of pedestrian and automobile and made parks and park systems the backbone of the neighborhoods. Traffic was handled by a hierarchical system of local streets (usually in the form of cul-de-sacs), distributors/collectors, arterials and freeways (which could have boulevard/parkway characteristics). This radical departure from traditional towns, eliminated the street as the center of public activities, as social meeting place and the locus of community life (Stein, 1951).

American New Towns and Planned Unit Developments of the 1960s and 1970s pursued many of the objectives of the earlier greenbelt towns—comprehensive planning, neighborhood organization, clustering, more compact infrastructure and preservation of stream corridors and other natural features. But most of them have suffered in various degrees, because of low density and automobile dependency, and from the general problems of suburbia: large amounts of land were being used up while real countryside was receding; wide streets of garage doors, driveways and empty front yards (gardens) engendered isolation, and discouraged walking and meeting others; the paucity of available community services caused anomie ('new town blues'); and the costs continued to escalate beyond the reach of many would-be home-buyers.

Nevertheless, several important aspects of the original Garden Cities and Greenbelt Towns dominate today's revisionist thinking: mixed use, public transit, small-scale streets, support services, the place of civic buildings for collective identity and expression and, especially germane to the potential of greenways to structure communities, the role of public open space and rural landscape preservation. These, allied to a new appreciation for historic accomplishments in the field of town and country planning, are fueling current discussions of greenways and urban form-making.

3. New villages and towns

One line of investigation starts with the smallest urban unit and, by a process of aggregation, develops a regional theory. Another considers a region and, by examining its natural and cultural components, postulates a better urbanizing pattern for accommodating growth while safeguarding natural areas. The former can get trapped in detail and lose the 'big picture'; the latter can be seduced by the elegant diagram and lose the human touch. Either way—starting from the microcosm and working up, or from the macrocosm and going down—the premise must be capable of application at all scales if it is to offer the hope of reuniting cities and countryside.

British modernism after World War II, faced with the choice of utopian visions of rebuilding cities that owed nothing to tradition—and, in fact, all but eliminated it—or the saccharine anti-urbanism of the garden-city derived New Towns, split into the Ville Radieuse or the vernacular village camps (Gosling and Maitland, 1984, p. 124). Serious enquirers got down to the business of actually studying 'good' settlements. Planners such as Thomas Sharp (1946) analyzed village forms, noting the highly variable but clearly articulated open-space patterns which underlay them (Figs. 4(A) and 4(B)). The Architectural Review published Gordon Cullen's studies of small towns and districts, in which streets and squares perceived in 'serial vision' was fundamental to the users' pleasurable experience—later codified under the term 'Townscape' (Cullen, 1961).
Fig. 4. Greenspaces in old and new English villages. (A) Finchingfield, Essex, view. (B) Plan (Sharp, 1946, pp. 16–17). (C) Project for Team X (Stirling, 1955, pp. 35, 36).
Moderne, founded in 1928) Meeting in 1955 focused on the four functions of towns and neighborhoods: dwelling, work, recreation and transportation—the latter two addressing open-space and circulation. Young modernists, such as James Stirling and Team X, at the outset of their stellar careers, chose to present proposals for 'new' villages based on vernacular models that respected the scale and materials of rural buildings and the traditional open-space patterns of village streets and their appendages (Fig. 4(C)).

Somewhere thereafter, these fruitful directions got lost in the furore of rebuilding that followed—buyers preferred individual houses to attached houses, streets became traffic conveyors, public open-space was lost to private open-space, and anonymous subdivisions replaced coherently planned communities. Efforts to counter these trends have resulted in some sympathetic additions and extensions to existing villages, and some village-inspired new developments (see, for example, Architecture in Arcadia, 1993). But, unfortunately, superficial copying and false sentimentality—far from the modernists' intent—have confused the issues.

Given that historic functions have changed—village commons are no longer needed for grazing or open grounds around towns for defence—a 'green' system that starts at the human scale of neighborhoods and districts is still a fundamentally felt social and psychological need to which planners and promoters should respond. Proposals such as Francois Spoerry's Port Grimaud (1977) or John Simpson's 'Upper Donnington, A Proposal for a New Village to be Constructed in the County of Berkshire' (1987) evade the challenge by seeking security in images of the past. The latest technology is engaged: Port Grimaud is supported on reinforced-concrete box-plate piles; Upper Donnington used computer-aided design. But the physical forms and appearance are a too literal pastiche of the originals, not the more difficult adaptation of principles seen to
be timeless to new situations that are constantly evolving. Port Grimaud is not a Mediterranean fishing port (although it looks like one) but an expensive second-home resort. Upper Donnington is not a village (although it has many of the accoutrements of one—a village 'inn', village 'hall', village 'shop', village 'school' cum day-care center surrounded by village 'commons') but a bedroom community for Newbury, the county seat (Fig. 5(A)). It is shaped by 'green' elements and has a local greenbelt; and it claimed to have market appeal but was never built (ironically, because it violated a statutory greenbelt). As an alternative model for structuring settlements in the countryside, it is seductive; but it fails as a generic solution.

Compare, for example, a project such as William Rawn's Lincoln Meadows, Lincoln, Massachusetts (1989) which uses the traditional New England 'connected farmhouse' as the starting point for a community of inexpensive multi-family dwellings, connecting them in loosely related groupings around greens suggestive of historic American Northeast land patterns of partially cleared openings in woodlands (Fig. 5(B)). A contemporary program is interpreted with respect for a regional architecture and landscape.

Or consider Deer Park Village, New York (Tourbier & Walmsley, Inc., 1992), a proposal for an affordable, pre-retirement community—very much a program for today, appealing to active singles or older couples in their 50s, whose children have grown and left home, and who have retired or semi-retired from modestly paid service jobs in the Greater New York area (such as teaching, nursing, secretarial, law enforcement, local

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Fig. 5. New villages: nostalgic escape or reinterpreting tradition? (A) Upper Donnington, Berkshire, UK, 1987 (John Simpson & Partners). (B) Lincoln Meadows, Lincoln, MA, 1989 (Yaro et al., 1990, p. 141).
government or the like) and want to live in the country within a two-hour drive of their families and friends. One thousand five hundred one-storey homes with individual gardens implied a strong community form; the 240 acre (96 ha) upland site of wooded hillsides on either side of a small stream and extensive wetlands suggested an inward-looking layout, with a single defined valley center and park. As program and site were matched, the plan evolved into six linear neighborhoods radiating from the center. Each took a different size and shape, filling out the irregular areas of gently sloping terrain. Undisturbed woodlands on the steeper slopes, plus a 200 ft. (61 m) minimum setback around the property and the 40 acre (16 ha) central park, made a pattern of encircling greenbelts around the village and its neighborhoods (Fig. 6(A)). Befitting a leisure-oriented community, ready access to the central facilities was essential and provided by a dual network of narrow, 20 ft. (6 m) country roads and separate but complementary pedestrian 'streets', both converging on the project's 'village green' (Fig. 6(B)). On two sides of the 2 acre (0.8 ha) green were all the public functions—a community center, recreation facilities, convenience stores, management offices, church site and meeting rooms—with housing on the other two sides. Through compact planning, 70% of the houses were within a 1/4 mile (400 m) radius of the central facilities, and no unit was further than 2000 ft. (600 m) away (Fig. 6(C)).

The pedestrian 'street' was derived from a plan at Trudeslund, Birkerod, Denmark (1981) exemplifying a Scandinavian concept of collective housing, known
in America as Co-housing (McCamant and Durrett, 1988). Trudeslund has 33 houses on 3.94 acres (1.6 ha) arranged in a double-row L-shape with automobiles on the outside and a park on the inside. The rows

Fig. 6. New villages: adapting greenbelt and greenway ideas to neighborhood clusters in woodland clearings. (A) Deer Park Village, Town of Deerpark, New York, 1992, general plan with greenbelts shown black. (B) General plan with greenways shown black. (C) Plan of northeast neighborhood and village center. (D) Partial plan showing greenbelt edge to neighborhood, greenway as pedestrian ‘street’ between typical double rows of housing, and narrow, uncurbed country roads with compact parking courts (Tourbier & Walmsley Inc., 1992).
are discontinuous, and between them is a pedestrian 'street' where families and children can play, stroll and meet. Where the two arms of the 'L' intersect, there is a community building with common dining room, hobby rooms, daycare center and a recycling plant.

Each house has a garden oriented to the morning or afternoon sun; the outside row of two-storey houses overlooks the inside row of one-storey houses, so that all units receive equivalent sun-exposure. In Europe, such projects are communally designed, built and man-
aged; the sharing concept has had limited success in the US (see, for example, 'A New Kind of Housing that Brings People Together', New York Times, 25 February 1993, pp. C1, 6.). The Deer Park planners transformed the planning concept into a separate, community-wide walking/jogging/bicycling route—a mini-greenway system servicing every house, threading through each neighborhood and leading to the central community facilities—to reduce automobile dependency for internally generated trips and encourage strolling, exercising and casual encounters between residents (Fig. 6(D)).

Besides the social aspects, the Deer Park proposal organized around greenbelts and greenways has numerous environmental benefits: shorter, narrower streets and compact utility systems mean less costly infrastructure; less runoff conveyed in grassy spillways saves on engineering and replenishes ground water systems; pitched roofs sited for solar orientation and the retention of half the site in woodlands reduces utility costs; and the tight configuration of the neighborhoods around pedestrian 'streets' concentrates site disturbance to limited areas in which specimen existing trees may be preserved and a new, domesticated landscape created.

Fig. 6 (continued).
Not least and central to this discussion, 'green' elements permeate and define the entire community—the individual private gardens, the walking/jogging/bicycling 'street' through the garden courts, the country roads and entrance parkway, the central green and valley park, and the enfolding woodland reservations.

At the finer grain of greenway-making, greenspaces can range from conservation zones with little or no human disturbance (e.g. wetlands) to active recreation grounds; and 'green' streets may have an urban or rural character depending on their function. There has been a tendency to focus on the passive 'green' elements rather than on the positive, urban form-making ones. Even where ecological concerns exert a strong influence, a community structure must be 'invented' if the human program is to be fully realized. For sites in which ecological discriminations are absent, the building/open space-form derives almost entirely from empirical decisions about the nature of settlements: 'green' systems are what the planner makes.

Such was the case of Whittingham, New Jersey (Walmsley and Company, 1986), midway between New York and Philadelphia on a flat coastal plain site of 420 acres (105 ha). The planning team looked to American small town traditions to convert a previously approved subdivision into three walkable villages around a central complex of community facilities. The plan was interwoven with a 9-hole par-three golf course, which functioned as 'the park' and accommodated stormwater management detention. Villages combined several shelter-types around a series of common greens. A typical green could be contained with the two arms of an eight-unit U-shaped apartment building, or formed on three sides by rows of 12–20 town houses (terrace houses). Approximating a 1/4 acre (1000 m²), the greens became the shared front yards (or gardens) for abutting units. Visitor parking was off the public street, a short walk away; beside and behind were 'Resident Only' drives for private garages and parking for two cars per unit, the American suburban standard ratio (Figs. 7(A) and 7(B)). Recognizing that what was seen from the streets went a long way in establishing the town's character and image, a Streetscape Manual (Walmsley and Company, 1989) identified the hierarchy of street types and functions, and controlled the cross-sections, curb cuts, walk locations, materials, fences, signs, lights and landscape treatment for 60 ft. (18 m) divided parkways, 36 ft.
Fig. 7. New towns: walkable neighborhoods with winding ‘green’ streets and mixed housing around irregular common greens. (A) Whittingham, NJ, 1986 (first section completed 1990), plan of Section 1, Village One. (B) Typical automobile-free green shared by 12-20 attached houses. (C) Typical streetscape: eight-unit apartment buildings around courtyard gardens off 24 ft. lanes (Walmsley and Company, 1986).
Fig. 7 (continued).

(11 m) streets, 30 ft. (9 m) roads, 24 ft. (7.3 m) lanes and 20 ft. (6 m) ways. These character distinctions were to be a consistent reference: the landscape guidelines, for example, were intended to discriminate between the discontinuous clump plantings of the largest forest trees along the parkways, from the curving tree-lined distributor streets and roads of the villages and the smaller-scaled flowering trees and hedges of the local lanes and ways (Fig. 7(C)). ‘The park’ as the largest, continuous open-space element winding through the housing areas separated the villages and was meant to give the town its rural setting. Unfortunately, there was no greenbelt and few existing landscape features on the open site to give the town a start. The first section completed in 1990 will take time to mature and the ‘green’ infrastructure on paper will require several years of consistent management if the objectives are to be achieved.

To the rediscovery of ‘green’ streets must be added the revival of interest in the street block, most clearly evidenced in the neo-traditional town planning of Duany and Plater-Zyberk (1991). Again, a careful study of small American towns has been the catalyst for a fresh planning approach that incorporated their best features: walkable streets in a simple grid layout defining neighborhoods of 1/4 mile (400 m) radius or 5 min walk from edge to center, with squares and ‘civic’ buildings to terminate vistas or give form to the street spaces, and a complementary pedestrian network along streets or through separate midblock alleys. Great attention was given to the street cross-sections which, like Whittingham, varied in accordance with their function and position in the town. But the controls were much more rigorous and far-reaching, and specifically directed towards achieving small town urbanity.

Starting in the 80 acre (32 ha) town, Seaside, Florida (Duany and Plater-Zyberk, 1985) with Urban Regulations for the public spaces and Architectural Regulations for the different house types, which prescribed building configurations, materials and construction keyed to a technically precise Regulating Plan, the controls evolved into a comprehensive set of what came to be known as Codes. Later, recognizing that the conventional zoning and subdivision ordinances written in the 1950s were actually producing the unsatisfactory suburban sprawl, frustrating both good ecology and good planning, and preventing innovations, wholly new Traditional Neighborhood Ordinances (TNDs)
Fig. 8 New towns: walkable neighborhoods based on flexible grid-plans adapted to site conditions, with ‘green’ streets focusing on schools, ‘civic’ buildings and public greenspaces, and shopping and office commercial along arterial highway frontages. (A) Belmct, Loudoun County, VA, 1988. (B) Kentlands, Gaithersburg, MD, 1988 (Duany and Plate-Zyberk, 1991, pp. 47, 53).
were written, which local planning agencies could add to their existing zoning regulations (Lennerz, 1991).

In the last 10 years, Duany and Platter-Zyberk have planned some 30 or so communities (Figs. 8(A) and 8(B)). The Codes, so necessary to ensure that different architects and builders understand and comply with the plans' intentions, have become standardized. Critics' fears that seaside-like Port Grimaud and Upper Donnington—was a beautiful deceit, incapable of wider application, have proved unfounded. The plans, although having common characteristics, appear to be infinitely variable and show a gradually increasing development up to a regional scale. All have grid layouts, but bent and skewed to fit different terrains. All emphasize streets, appropriately sized and detailed. Squares and parks are distributed and designed as special places in coordination with well-placed 'civic' buildings. All are based on walkable neighborhoods of limited size with shops, workplaces, schools and residences for all income groups in close proximity. And all incorporate existing natural features into the plans even, like Olmsted before, exploiting the accidents of site to impart distinctive characters to different districts. The prominence given to public open spaces—streets,
squares and parks—to structure community plans, as they have worked their way up through the neighborhood, village and town scales, suggests the beginnings of a basis for a regional ‘green’ infrastructure.

4. Regional patterns

Considering the region, the planning issues come down to how to preserve the countryside and prevent its invasion by low-density suburban development; and its corollary, how to guide development into compact new settlements (or extensions of existing settlements) which preserve Howard’s distinctions between ‘town/country’. The potential resolution of these issues can be approached from either the rural preservation perspective or the urban composition perspective: either way, proposals must show that the two are complementary. Out of their reconciliation can come a new regional pattern “to link together the rural and urban spaces in the American landscape”. (President’s Commission on Americans Outdoors, 1987, p. 102.)

‘The Design Manual for the Conservation and Development of New England’s Connecticut River Valley’ (Yaro et al., 1990) is one such guide that starts from the proposition that the rural landscapes of the
valley are beautiful and vulnerable; they cannot be ‘frozen’ in time since they have been evolving for four centuries and will continue to evolve; alternative growth patterns are possible that provide for the inevitable development without destroying them (Yaro et al., 1990). Coming from planners and landscape architects, two basic choices are offered: a continuation of “conventional subdivision practices, wherein 100% of the tract is covered by streets, houses, front yards, back yards and side yards” and “protected (landscape) areas would become ‘islands’ surrounded by a ‘sea’ of sprawling low-density development, similar in nature to the land-use patterns ringing most of the major metropolitan centers throughout the United States”. Or, the ‘creative’ alternative of adapting the traditional, tightly-knit village pattern typical of rural New England which (as other investigators concluded), is “illegal to reproduce or emulate in many, if not most, rural Massachusetts communities today” (Yaro et al., 1990, p. 13).

Through halving the amount of land to be built on by down-sizing lots by 50% and locating houses in a woodland fringe at the edges of fields (or screened from the fields by newly planted shelter belts), the country views of scattered farms, open fields and wooded hillsides can be preserved. The applications of the new

Fig. 10. Preserving rural landscapes as working greenbelts: expanding English towns in tightly-planned, clustered districts or urban ‘quarters’, adapting traditional streets and squares, parks and commons, and utilizing traditional building types and materials. (A) Poundbury Development, Dorchester, UK, 1989; existing ‘grain’ of the town with the historic center encircled by suburbs. (B) Proposed new urban ‘quarters’ to redefine the town’s edge. (C) Boulevards separating each ‘quarter’ into a small town, with local functions around squares and high (main) streets, and a new civic center for the town and county on the higher ground to the northwest. (D) Middle Farm Quarter, with high (main) streets radiating from the central square to visually interconnect prominent public buildings and their greenspaces to parks and countryside (Krier, 1989, pp. 48–51).
standards are graphically presented in eight examples; since concerned with the pragmatic issues of saving farms and preventing strip development, only one example deals with the 'urban' question of expanding an existing village (Figs. 9(A) and 9(B)). The image of a more compact rural building form framed and punctuated by continuous open space is clear, even though 'fuzzy-edged' in Lynch's terms.

By comparison, the plans by Belgian architect Leon Krier for the Poundbury Development addition to Dorchester, UK (Krier, 1989), which will enlarge the town by 60%, are positively 'hard-edged' (Figs. 10(A) and 10(B)). An old Roman town surrounded by 20th century suburbs, Krier proposes for the new addition a return to the compact form of the historic center. The 450 acre (112 ha) site between the suburbs and a new by-pass is sub-divided into four walkable districts or urban 'quarters', each about a 100 acres (40 ha) modelled on a traditional Dorset town or village having a traditional street pattern with park/common, and traditional building types and materials. Each 'quarter' is to be clearly defined by promenades and parades, inspired by Dorchester's tree-lined South and West Walks. Through traffic is channelled on the boulevards separating the 'quarters'; these tree-lined avenues focus on important natural features, cultural monuments or institutional buildings proposed for the prominent sites (Fig. 10(C)). Having preserved the greenbelt in toto, the architect is less interested in making physical connections to it (although visual links are set up and continuations of the avenue's pedestrian ways into the countryside could be easily achieved) than constructing a street network that, in the districts, replicates the irregular tight-packed blocks and squares of the pre-industrial medieval town (Fig. 10(D)). The results, so different from the New England village or the neo-
traditional American towns, reflect Krier's heavily urbanized European background colored by intensely historic and highly picturesque traditions.

In contrast, Duany and Plater-Zyberk invoke similar town-making principles through more spacious geometries that come out of the American experience of subduing and imposing order on the vagaries of a vast, new continent. Their large planning projects, such as Avalon Park, Orlando, Florida (1989) and Nance Canyon, Chico, California (1990) have evolved inexorably into large regional plans (Duany and Plater-Zyberk, 1991, pp. 46-57). As Unwin would put it, "the model village led into the garden village; and the garden village to the garden city; and the garden city to the new and satellite towns" (Unwin, 1930, p. 38). Except the results, in this case, are not satellite towns so much
as aggregates of neighborhoods, villages and towns making spread-out cities, that provide for the movement of people by graduated highways and transit, and for the protection of fragile ecosystems by conservation zones—the steep slopes and ridge lines of Nance Canyon and the rivers and wetlands of Avalon Park (Figs. 11(A) and 11(B)). Both plans respect the Howard ideal by having walk-scaled villages and towns separated by greenbelts which, because master planned at one time for one developer, can really be held in common ownership by the community.

At this scale, issues of sustainability have to be—and are—addressed: in Nance Canyon, which is in a semi-arid region, water is to be used sparingly and recycled, irrigation is be limited to 350 acres of ‘primary hydrozones’ (lawns, swimming pool edges and vegetable gardens) or about 5% of the total site, wetlands are to be created for the treatment of sewage
Fig. 11. New regional cities: mega-developments based on aggregating park-centered neighborhoods, villages and towns around 'green' boulevards/parkways and transit systems, with greenbelts as conservation zones for the protection of fragile ecosystems. (A) Nance Canyon, Chico, CA, 1990, linear villages on the ridges and 80% of the site left essentially natural. (B) Avalon Park, Orlando, FL, 1989, four towns and six villages, each with three or four neighborhoods, with half the site reserved for the river estuaries, wetlands and native 'hammocks' (Duany and Plater-Zyberk, 1991, pp. 83, 89).
effluent, 'grey' water is to be used for parks' and school grounds' irrigation, and for fire protection, runoff is to be impounded downstream for flood control and wildlife, and four-fifths of the 3000 + acres (1200 + ha) are to remain essentially natural in an 'elemental hydro-zone' with no irrigation (Thayer, 1991). At Avalon Park, in flat central Florida, water is also key: more than half the site is reserved for the river estuaries, wetlands and native 'hammocks' which are incorporated into neighborhood parks (Duany and Plater-Zyberk, 1991, p. 88).

The urban forms of these two plans derive from the dictates of the two very different topographies. Nance Canyon's villages are linear, straddling the ridges; Avalon Park's are four-square, reflecting the pre-existing 1 square mile Jeffersonian grid: 25 000 units in 15 square miles (39 km²) are organized into four towns and six villages, each with three or four neighborhoods within the 5 min walk radius. The most completely worked out Code of Street Types includes 'more rural' and 'more urban' parkways, boulevards, highways and avenues for regional traffic; main and secondary streets for high density residential and commercial traffic; roads

Fig. 12. New regional cities: urban growth accommodated into walkable Pedestrian Pockets of 60–125 acres clustered around transit stops about 1 mile apart, with working landscapes in between. (A) A typical Pocket with housing, retail, office, parks and local support services, surrounded by fields and farms. (B) Mixed housing around parks for families, singles, couples and elderly, close to services and Light Rail trolley line. (C) Retail and back office close to station and parking, and main street sharing with Light Rail. (D) Diverse open space from small public courtyards to central parks, like Radburn but with short walk routes to the shopping street, offices and station, forming "the primary order for the place". (E) Pockets of varying size joined by transit, each occupying about 1/16 the area of a typical subdivision and together accommodating the region's projected growth (Kelbaugh, 1989, pp. 9, 13, 15, 16, 18).
and lanes for low density residential, alleys and ways for service—an expansion and refinement of Stein's four categories (Duany and Plater-Zyberk, 1991, p. 101). In its socially driven distribution of neighborhood parks and playgrounds, schools and community parks, its tree-lined boulevards and parkways, and the broad swathes of its regional valley parks, Avalon resembles a miniature version of Kessler's spread-out, multi-center plan for Kansas City, Missouri, of a century earlier (compare Figs. 3(A) and 11(B)).

A different and thoroughly pragmatic alternative for a regional growth pattern has been proposed by Van der Rijn and Calthorpe (1986). The walkable village core presented therein has evolved with Kelbaugh
Fig. 13. New regional cities under construction: Laguna West, Sacramento, CA, 1990. (A) The Pedestrian Pocket as a mixed-use, walkable town center: higher density housing with urban parks cluster around the core; tree-shaded boulevards and a spine of community parks radiate out to single-family neighborhoods beyond (Leccese, 1990, p. 47). (B) Outlying neighborhoods have local parks, school grounds and winding ‘green’ streets to promote sociability (Calthorpe Associates, 1990).
(1989) into the Pedestrian Pocket, “a simple cluster of housing, retail and office within a 1/4 mile walking radius of a transit system” (Fig. 12(A)) (Kelbaugh, 1989, pp. 6–20). Calthorpe (1993) has advocated Transit Orientated Developments (TODs) to fundamentally redirect community planning for regions, transit station areas, neighborhoods, and towns and new towns. Calthorpe and Kelbaugh take up ideas that have been around for 100 years. The center-piece of Arturo Soria y Mata’s linear suburb for Madrid (1894)) for example, was a tree-lined boulevard, with a private street-car line connecting to lines to the city center (Lynch, 1981, p. 87). In ‘A Town called Alcan’ (1960), Gordon Cullen explored the concept of a loop town with a series of sub-centers, joined by a “town circuit road or monorail” with a central park within and a greenbelt around (Gosling and Maitland, 1984, p. 49). But the notion of radial lines of Pedestrian Pockets fanning out from cities is a new twist in the effort to reformulate suburbia.

Pedestrian Pockets can be as various as Avalon Park’s four towns (Figs. 12(B)–12(D)). Each is of a size, 60–125 acres (15–31 ha), which US developers are accustomed to assemble, master plan and build. These miniature satellite developments, strung together on new light rail lines (or roads dedicated to car pools and buses) can accommodate a region’s anticipated growth and provide suburbia’s missing focus (Fig. 12(E)). By “balancing and clustering jobs, housing, shopping, recreation and child care, the Pedestrian Pocket uses one-sixteenth of the land area of a typical suburban development. Open space and precious agricultural land coexist with a region’s growth” (Kelbaugh, 1989, p. 9).

The first Pedestrian Pocket to go into construction, Laguna West (Calthorpe Associates, 1990), is the center-piece of a larger development on an 800 acre (324 ha) flat and featureless former ranch tract outside Sacramento, California. The mixed use, walkable town center has 1000 units of higher density housing, 90 000 ft.² (8400 m²) of shops, 150 000 ft.² (14 000 m²) of service offices and three urban parks (Fig. 13(A)). From it, tree-shaded boulevards and a community park radiate out across a 65 acre (76 ha) ring of lakes to five park-centered, single-family neighborhoods of 2300 units (Fig. 13(B)). Each neighborhood has local parks and sports fields (adjoining school sites), squares and playgrounds, and ‘green’ streets. All the usual elements of suburbia are reconfigured into a more ‘town-like’ form: compact, mixed use and oriented to the pedestrian. Hemmed in by highways and a railroad, there is no outward connection to farms and fields (the ‘green’ radials terminate within the property); nor are there vestigial remnants of the former landscape preserved as linear parks. Instead, the hope for community identity and vitality resides in the internal ‘green’ structure of new parks and streets that are convenient and comfortable to walk. Calthorpe, in fact, “eschews greenway-style walking corridors through woods”, and, like Hough, believes, “The street becomes the social glue. You want to have houses oriented towards the street” (Leccese, 1990).

Whether a series of Laguna Wests around freeway interchanges (or on transit lines) can deliver suburbia from traffic gridlock and countryside despoliation is moot at this time. Much will depend on the success of this and other projects, even larger and more formidable, such as the 10 000 acre Lexington Park development in Florida (which has six Pedestrian Pockets joined by a bus loop and a mixed-use town center where the main street is shared with Light Rail). Certainly, at the community level, the urban form is shaped by ‘green routes’. There would seem to be no compelling reason why tree-lined walk/bike streets radiating out from mixed-use centers (with jogging paths round the lakes) could not be extended to generate a regional ‘green’ infrastructure; or why the plans could not become less geometric and ‘artificial’ in other topographies than the flat terrains of California and Florida. But so far, the regional vision seems too much like the one rejected in the Connecticut Valley—a ‘sea’ of low-density planned suburbia, with nodes of higher density at transit stops, and ‘islands’ of preserved landscape.

5. From cities to regions

Villages, towns, regional plans. The discussion has focused on the urbanizing fringe where 80% of new building is occurring, whole ‘edge cities’ are in formation and there is a chance to impose a less wasteful, more coherent development pattern. But city centers and downtowns, with their older neighborhoods and districts (some long neglected) must, also, renew themselves. They, too, can utilize greenways to give definition to ‘old cities’ and ‘urban villages’ — com-
pact, mixed-use, walkable and transit friendly—and reveal something of the natural and cultural histories of their sites that are the key to their original distinctive personalities: the rivers that determined their locations and gave form to their early development; the regional landforms which controlled and conditioned their growth.

‘Rivers through the City’ and ‘Nature’s Corridors’ are two types of greenway that Little celebrated in his North American survey (Little, 1990, pp. 81–91, 105–116). The recovery of urban riverfronts, no longer needed for shipping and industry, and their conversion to public use is in the process of transforming many US cities. Carr/Lynch’s ‘Walk to the Sea’ (1962) triggered the design of Waterfront Park and a whole series of developments around Boston Harbor, continuing today in the New Charles River Basin. Denver’s 40-mile long Platte River Greenway (1965) is another success story in progress: for years a flooding problem, its floodway was replanned as parkland with built-in flood storage, ranging from reinforced banks and concrete amphitheaters for summer festivals in Confluence Park downtown, to natural marshes, riparian vegetation and hiking trails in the suburbs (Little, 1990, pp. 172–178). Chattanooga’s 20 mile long Riverpark (Carr, Lynch, Hack and Sandell, 1985–1988) pivots on the redevelopment of the historic crossing of the Tennessee River at Ross’s Landing, from which emanate riverparks, marinas, golf courses, a botanical garden and conservation areas. Development of the old buildings,
LEGEND

Fig. 14 (continued).

PATAPSCO GREENWAY
ANNE ARUNDEL/BALTIMORE/HOWARD COUNTIES/BALTIMORE CITY

Fig. 14 (continued).
storage yards and piers into new city docks, an aquarium, a hotel, a regional history museum, an industrial history center, office space and housing will eventually create a new urban edge that reunites city and river, and a greenway (like Boston’s Charles River and Denver’s Platte River) that begins to reconnect the city with its rural hinterland (Little, 1990, pp. 140–143). Heritage Parks, such as Lowell, Massachusetts, offer similar opportunities for converting historic downtowns into unique cultural, arts and entertainment districts that redefine the relationship between the old city and its rivers’ edges (Fig. 14(A)).

Regional physiographies have a profound influence on cities’ growth and greenway-making. For example, the rivers and tributaries draining into the northern end of Chesapeake Bay have shaped the historic development of Baltimore and its surrounding counties, and have provided the framework of a regional greenway system (Little, 1990, pp. 131–133). The Olmsted Brothers anticipated this in their Plan of 1904, recommending the Patapsco River for parkland acquisition. The State of Maryland subsequently designated several state parks in the Upper Patapso; the Lower Patapsco Greenway Plan (Walmsley and Company, 1988), sponsored by the State, three counties and the city, was a scheme to reclaim a 12-mile degraded stretch of the river to link downtown Baltimore with the State parks upstream (Fig. 14(B)). New access points, a slow-speed scenic parkway, an extension of Light Rail to service key entry locations, reclamation of a former landfill for a public golf course, expansion of water-oriented recreation, new bikeways and hiking trails, historic designations for significant districts and properties, mixed-use development on abutting lands, and sites for special uses (such as an International Garden Festival and a US Olympic Training Center for the East) were all part of the action agenda—little of which has been acted upon. The city’s own Gwynns Falls Greenway (1991), extending 6 miles northwest from Baltimore’s Inner Harbor, started land acquisition in 1992 with 50% City and 50% State funds through the Transportation Enhancements Program of the Federal Government’s Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). But these initiatives have come after years of neglect, with many sections often inaccessible and under-utilized and many necessary linkages waiting to be secured. Yet the potential is great for the city, communities and resource professionals to transform the stream valleys into a regional greenway system of linear parks and recreational ‘gateways’.

The hills around Boston’s Massachusetts Bay or San Francisco Bay have framed the growth of both cities and their regions. In Massachusetts, the Bay Circuit is the results of over a century’s planning going back to Olmsted and Eliot, which has survived two world wars and the depression. Its logic—a circumferential system of parks and green linkages with radials to the Bay—is as strong today as when first presented by Benton McKaye and Charles Eliot II (nephew of Charles, Jr.) in 1929 (Little, 1990, pp. 161–165). San Francisco’s Bay and Ridge Trails Plan (1987), resulting from thirty years of planning by many levels of government urged on by numerous civic organizations, is the clearest expression (on paper, at least) of the potential for greenways to be a regional ‘green’ infrastructure for today’s mega-cities (Fig. 14(C)) (Little, 1990, pp. 155–165).

New York City, with the legacy of Olmsted and Vaux’ parks and parkways (for carriages) and Robert Moses’ regional parks and parkway systems (for automobiles, which have since become choked trafficways)
Fig. 15. Riverways redefining the city's edge: New York City. (A) The old Penn Central Yards on the west side. (B) Riverside South, with a 21 acre (5 ha) park continuing Olmsted's Riverside Park (left) southwards, 1992 (Riverside South).
has, since the reformist 1960s, shown leadership in recovering its waterfronts, restoring and rebuilding its parks, refurbishing its squares, making opportunities for new 'green' streets in the process of improving its business districts and neighborhoods, and taking steps to protect its upstate reservations crucial for water supply (but it has neglected some of its great avenues: Fifth Avenue, for example, for 36 blocks from 23rd to 59th Streets, arguably a world-class promenade street connecting such universally known and admired landmark buildings as the Flatiron Building, the Empire State Building, the New York Public Library, Rockefeller Center and the Plaza Hotel, has an average of less than one tree per block per sidewalk). The Lower Manhattan Plan (1966) was the catalyst for waterfront developments on the Hudson, East and Harlem Rivers.
BUILDING A METROPOLITAN GREENSWARD

The Metropolitan Greensward is a vision of a system of protected open spaces, greenways and rural landscapes that distinguish the cities and suburbs of the New York/New Jersey/Connecticut metropolitan region. By implementing the Greensward, the Region will conserve its critical natural resource systems, its recreational opportunities and the working landscapes of farms and forests. Together, these protected open lands will help shape future patterns of growth in the Tri-State Region.

REGIONAL RESERVES

To construct the Greensward, the Region must help communities manage change in nine special places, or “regional reserves,” which encompass the Region’s most important scenic, biological and water resources and which are now threatened by urban sprawl.

<table>
<thead>
<tr>
<th>Catskill Park</th>
<th>Delaware River Valley</th>
<th>Hudson River Valley</th>
<th>Long Island Pine Barrens/Paconic Estuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Island Sound</td>
<td>The Appalachian Highlands of New York, New Jersey and Connecticut</td>
<td>New York—New Jersey Harbor</td>
<td>Shoswongunk Mountains/Kittatinny Mountain</td>
</tr>
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Building the Greensward also means weaving together a network of Greenways and Greenspaces that protects and enhances individual rivers, trails, ridgelines and urban open lands. Seventy-two of the most important public and private initiatives are listed below.

**NEW YORK**

1. Long Path
2. Route 28 Corridor
3. Mongaup River and Reservoirs
4. Neversink River and Goerge
5. Delaware and Hudson Canal/Ontario and Western Right-of-Way
6. Shoswongunk Kill
7. Black Dirt Agricultural Area
8. Shedding Forest
9. Hudson River Shore Trails
10. Wappinger Creek
11. Siteising Mountain
12. Catharine Valley Right-of-Way
13. Nellie Hill
14. Putnam/Northern Tier Greenway
15. Great Swamp
16. Putnam Division Right-of-Way
17. Hutchinson River Parkway
18. Hudson River Waterfront Park
19. East River Esplanade
20. Harlem River Esplanade/Putnam Railroad Greenway
21. Bronx River Greenway/Scarsdale and Ferry Point Parks
22. East Briar-City Island Greenway
23. Queens-East River Greenway/North Shore Fishing Meadow Trail
24. Brooklyn-Queens Greenway/North Brooklyn Greenway/Prospect Park
25. Cross Brooklyn Greenway
26. Shore Bikeway/Jamaica Bay-Forest Park Trail
27. Laurelton Parkway Greenway/Rockaway Greenway Greenway
28. Staten Island Greenbelt
29. North Shore Esplanade/Staten Island Railroad Trail
30. West Shore Greenway
31. South Shore Esplanade
32. Oyster Bay Estate and Waterfront
33. Underhill Estate
34. Nassau-Suffolk Border Trail
35. Cross County Trail
36. North Fork Trail
37. South Fork/Westhampton Trail
38. Deer Pine Barrens
39. Shinnecock Bay Trail Wetlands
40. Robbins Island
41. Long Pond Greenbelt
42. Peulines Kill Trail
43. Bear Swamp
44. Wicomico River Greenway
45. Delaware River Greenway
46. Lehigh and Hudson Right-of-Way/Poquessing Greenway
47. Montauk Canal
48. Musconetcong River
49. Raritan/Black River
50. Lenape Trail/Paterson Path
51. Passaic River
52. Pyramid Mountain/Turkey Mountain/Farmers Highlands/Wysoxake Highlands
53. Raritan Mountains and River
54. Lower Paterson Cliffs/Hudson Waterfront Walkway
55. Railway Trail/Arthur Kill Tributaries
56. Sussex Mountain
57. Sandburg Mountain Ridge
58. Bayshore Project
59. Monomoy River
60. Northern Barnegat Bay/Relics Bank River

**CONNECTICUT**

61. Robbins Swamp
62. Housatonic River and Tributaries
63. Mianus River
64. Merit Park/Water Cross Parkway
65. Bridgeport Hydraulic Lands
66. Pequonnock River
67. West Rock Ridge Trail
68. Boston and Maine High-ridge Way/Farmington Canal
69. Farmington River
70. Metroconnect Trail
71. Middletown Trail
72. New Haven Water Co. Lands

Fig. 16. Greenways and greenspaces shaping regional growth: a plan for the New York/New Jersey/Connecticut metropolitan region, Building a Metropolitan Greensward, 1993. Nine ‘regional reserves’ are proposed, in which economic development should be built around natural resources and landscape values, to make a “green edge to growth” (Regional Plan Association of New York, 1993).
(not to mention the Bronx River Greenway, the Brooklyn/Queens Greenway, the Staten Island Greenbelt and other initiatives in the boroughs). These have added many public esplanades and river parks (and a whole new district—Battery Park City—with its own Hudson River Park and Esplanade) to the earlier parks and riverwalks which, like Chattanooga, are redefining the urban edges of the historic city. Current projects are heroic in their scope and aspirations: Harbor Park to embrace all five boroughs' parks, monuments and cul-

Fig. 17. City and region redefining itself. Seattle, Washington. (A) Olmsted Brothers Plan of Parks, Boulevards and Playgrounds, issued by the Board of Park Commissioners, 1904 (Seattle Department of Parks and Recreation). (B) Seattle Commons, aerial perspective of the 'Olmsted' Scheme, 1992 (Kelbaugh and Maurer, 1992, p. 11).
ural attractions on both sides of Upper New York Bay and the city's rivers, joined by high-speed ferries; the development of 5 miles of Hudson River waterfront, including the West Side Waterfront Parks and Riverside South, the conversion of the old Penn Central yards to a 21 acre park for a new high-rise neighborhood of about 15 000 which, with the realignment of the Hudson River Drive inboard, will bring back public access to the water's edge (Figs. 15(A) and 15(B)); the Hunters Point waterfront development and Brooklyn Piers project on the East River; the 5.4 mile (8.7 km) East River Bikeway/Esplanade with Intermodal Surface Transportation Efficiency Act (ISTEA) funds; the Hudson River Greenway (announced in 1991) from the southerly tip of Manhattan to Troy, 150 miles (240 km) upstream, the northernmost greenway community and designated eastern end of the State's Canal Recreationway System; the New York City Department of City Planning's ‘Comprehensive Waterfront Plan: Reclaiming the City’s Edge’ (1992); and the 1993 Regional Plan Association’s Metropolitan Greensward Plan (Fig. 16), designed as a ‘green edge to growth’.

The proposed Metropolitan Greensward is a system of Regional Reserves encompassing the Region's most important scenic, biological and water resources which are now threatened by urban sprawl. By helping ‘communities manage change (in these areas), protected open lands will help shape future patterns of growth in the Tri-State Region’. Robert D. Yaro, the plan's author, likens the greensward concept to ‘metropolitan firebreaks’. Across the US, the ‘green’ movement in cities has evolved into regional open-space conservation. Four out of five metropolitan regions—New York, San Francisco, Chicago and Philadelphia—are currently working on regional open-space plans ‘to shape the form of cities and regions’ and are collectively promoting a National Metropolitan Greenspace Initiative to fund grassroots Regional Reservation efforts and open-space conservation planning. The stated objective of ‘weaving together a network of Greenways and Greenspaces that protects and enhances individual rivers, trails, ridge lines and urban open space lands’ is the closest thing to the vision of a comprehensive ‘green’ infrastructure ‘threading through cities and countrysides like a giant circulation system’ (President’s Commission on Americans Outdoors, 1987, p. 102.)

As a final North American example of a city and region redefining itself, consider Seattle, Washington with its stunningly beautiful setting of water and mountains: Puget Sound, off-shore islands linked by ferries and the Olympic Mountains to the west, Lake Washington, the Cascades, Mount Baker and Mount Rainier to the east. A young city not yet 150 years old, greenways figured early in its efforts to preserve its scenic assets. A system of parks was started in the 1890s and greatly expanded by the Olmsted Brothers' consultancy for some 35 years from 1903. Plans were formalized in their 1909 'Plan of Parks, Boulevards and Playgrounds' (Fig. 17(A)), and numerous projects for parks and parkways. Since the 1950s, explosive growth has been countered by strong historic preservation and natural conservation efforts, producing a quite remarkable list of greenway-driven projects: Freeway Park over three blocks of downtown Interstate, Lake Washington clean-up and improvements to 9 mile Lake Washington Boulevard, county park systems' expansion, farmlands' preservation, San Juan Islands Ferryboat Corridor Greenway for 500 miles (800 km) of scenic shoreline, and the 20 mile (32 km) Mountains to Sound Greenway—a trail-blazing effort to make an existing Interstate highway into a broad, multi-purpose, scenic, working and recreational greenway, reversing the Moses' syndrome of parkways becoming highways (Roberts, 1991). The 'Greenway across the Cascades' (Chasan, 1993) reflects Pacific Northwest concerns; but it illustrates the range of issues that regional greenway planning should address: (1) retain forest preserves; (2) preserve working forests; (3) protect historic features; (4) assist communities to keep their special character; (5) preserve and enhance wildlife corridors; (6) make readily accessible natural educational opportunities; (7) create hiking, biking and horse-riding trails and other outdoor recreation facilities; (8) enhance tourism; (9) provide a safe, efficient and attractive transportation system; (10) channelize development into the right locations and appropriate patterns; (11) establish buffer zones to separate and humanize communities (Hornung, 1992).

Such civic and metropolitan initiatives are re-shaping Greater Seattle from without; others, designed to deflect some of the impetus of suburbanization, are re-forming the city from within. One such project is Seattle Commons: the rebuilding of a 278 acre (113 ha) inner city district into an 'Urban Village' of 16 000, in three
walkable neighborhoods around a new 45 acre (20 ha) community park, reconnecting downtown Seattle to Lake Union (Fig. 17(B)) (Kelbaugh and Maurer, 1992). The park is the plan’s armature: pushing tentacles of ‘green’ out on three sides through the heart of each neighborhood and opening up, on the fourth side, to embrace the lake and lakeshore parks that tie-in to the Olmsted system and through the county parks to the region. At the community level, there is a full range of greenway elements: tree-planted boulevards/parkways and ‘green’ streets; one-block parks/playgrounds in the two ‘family’ neighborhoods; a narrow chain of urban water-parks in the high-density downtown neighborhood; and small parklets and roof gardens over ground level parking for block residents. One side was to be the community’s ‘Fifth Avenue’ to its ‘Central Park’; the other side was to blend into the neighborhood as sports fields, picnic areas, an open-air theater and an elementary school playground (Nelson, 1991). The principles behind neo-traditional village and towns—walkable neighborhoods, mixed use, live and work places in close proximity, prominent civic/community buildings, and an overall ‘green’ infrastructure of public open spaces—are convincingly applied to the replanning of a city district.

6. Conclusion

Greenways are still a powerful and persuasive idea around which to structure communities. The historic initiatives of greenway planning and design, which guided and influenced the growth of North American cities in a predominantly pre-automobile age, can be rediscovered and reinvented anew for today’s decentralizing urban conurbations, multiple movement systems, information explosions, fast communications, mobile life-styles and multi-cultural societies. For an all-inclusive system serving the entire populace and joining downtowns and inner-city neighborhoods, through the suburbs to the countryside, the concept of a green infrastructure must be applied at all scales. At the micro-scale, congested downtowns must be relieved with walkable tree-shaded streets and avenues, ‘vest-pocket’ parks, playgrounds, waterfront promenades and urban plazas that respond to solar orientation, notable buildings, public congregation needs and significant views; parks, playgrounds, squares and community gardens must be established around which new neighborhoods can coalesce; and, remnant water-courses, natural formations and wastelands must be reclaimed and consolidated with institutional and private grounds. At the macro-scale, formless ‘edge cities’ must be given form through boulevards and parkways for intra-neighborhood, non-commercial travel of all types (be they walkers, joggers, bikers, horse-riders, carriage drivers, skateboarders, roller-bladers and short-trip, slow-speed transit and vehicle operators); linear parks and campgrounds must be linked up into continuous trail systems, incorporating stream valleys, hillsides, ridge-lines, historic and public properties of all kinds having high scenic or cultural interest; and, working landscapes, aquifer recharge areas, regional reservations, ‘Rails to Trails’ networks, recreational rivers and canals, historic towns and landscapes, and scenic byways must be maintained for the larger public good.

Olmsted’s ideal that “no part of the town should be finally many minutes walk away from some one (parkway segment or another) ... so that passing through them ... some substantial recreation advantage may be gained” is even more germane for today’s urbanizing populations. New versions of ‘town/country’ have to be invented if this vision of providing people access to open-space close to where they live is to be achieved. They are not likely to be as hard-edged as the Garden City protagonists advocated, though absolute preservation must still be the goal in special cases. To achieve a comprehensive regional green network that joins inner cities to the countryside, cities’ urbanizing hinterlands will need greenway corridors to interweave with development in more structured and articulated patterns than hitherto. The urban environments of today’s mega-cities should be increasingly shaped by Lynch’s open-space counterforms. Among them, greenways of all scales and categories have a strongly formative and integrative role to play.

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References


