



"The Next American Metropolis"

from *The Next American Metropolis:
Ecology, Community, and the American
Dream* (1993)

Peter Calthorpe

Editors' Introduction



In the early twentieth century, urban thinkers often focused on improving the physical form of the city, with specific proposals for new towns, improved neighborhoods, and dispersion of population from overcrowded industrial cities into regional constellations of communities. This tradition of visionary physical planning never entirely disappeared during the middle of the century – figures such as Ian McHarg, American planning consultant Victor Gruen, and Greek visionary Constantine Doxiotis continued to explore new directions – but by and large urban planning became a more pragmatic field built on a foundation of scientific or economic analysis. Planning documents themselves no longer had as many maps, drawings, or graphic visions in them. Instead, many planners opted for the collection of quantitative data on economics, housing, or transportation, and relied on computer models and policy analysis. Some theorists such as University of California at Los Angeles urban geographer Edward Soja have argued that the dimension of "space" itself disappeared from planning discourses. Normative statements about what constitutes good city form also became scarce.

Toward the end of the century the pendulum began to swing back the other way, toward a renewed appreciation of the role of physical planning and urban design. Many observers came to see the need for new types of urban form that would make cities and towns more habitable and ecologically oriented. Strong public movements to manage outward urban expansion ("growth management") and to create more coherent systems of parks, greenways, and open space also emerged. Jane Jacobs helped lay the groundwork for a renewed emphasis on "place-making" with her critique of the sterile, automobile-oriented urban landscapes created by much mid-twentieth-century modernist architecture and urban renewal. What was important, in her view, was the day-to-day life and vitality of urban places. MIT planning professor Kevin Lynch also helped catalyze a new interest in normative urban design values with books such as *Good City Form* (Cambridge, MA: MIT Press, 1981), which analyzed the physical form of human settlements throughout history and arrived at a set of design principles that Lynch argued were important for livable cities. University of California at Berkeley architecture professor Christopher Alexander and his colleagues likewise sought to determine features of what they called "the timeless way of building," and in their book *A Pattern Language* (New York: Oxford University Press, 1977) set forth a list of fifty characteristics of good urban form throughout history that they argued could be combined to produce livable places.

These and other writers helped lay the groundwork for renewed attention to ways of creating livable, walkable places, but the leading movement in terms of actually changing community form came to be called the

New Urbanism. This philosophy emerged in the 1980s and 1990s as a number of architects and planners sought ways to create neighborhoods that emulated features of the traditional American small town. Early on, leaders of the movement used terms such as "traditional neighborhood design" to describe their work, and adopted many design concepts from towns laid out a hundred years before such as grid-like street networks, mid-block alleys, village centers with small shops and workplaces, front porches, and garages at the rear of houses rather than in the front. (If these designers had used European small towns as a model instead, they might well have gravitated toward more winding, organic street patterns and more urban housing forms.)

Miami-based architects Andres Duany and Elizabeth Plater-Zyberk (designers of new communities such as Seaside and Kentlands), Bay Area-based designer Peter Calthorpe (designer of Laguna West and regional planning consultant for Portland, Salt Lake City, Minneapolis-St. Paul, and Chicago), and Los Angeles-based designers Stefanos Polyzoides and Elizabeth Moule were among the founders of the new movement. By taking the name Congress for the New Urbanism (CNU), they consciously positioned themselves as an alternative to the 1930s modernist architectural movement known as the Congrès Internationaux d'Architecture Moderne (CIAM). The CNU held its first annual Congress in Alexandria, Virginia in 1993, and issued a Charter for the New Urbanism in 1996 (San Francisco: Congress for the New Urbanism, 2000). By the turn of the millennium several hundred New Urbanist-inspired neighborhoods were under construction in North America, both on infill locations (within existing urban areas) and greenfield sites (unbuilt open land at the urban fringe). Equally importantly, New Urbanist design principles were diffusing into planning and design professions throughout the world. In Britain, Prince Charles' Prince of Wales Institute served as a vehicle for promoting similar types of urban design, and on the continent architects such as Rob and Leon Krier designed relatively dense new urban additions to existing cities. Many New Urbanist projects may be seen as promoting sustainability, in that they help produce more compact, pedestrian-oriented, resource-efficient urban communities. However, they can also be criticized on various grounds, such as for not providing enough affordable housing, not using green architecture or landscaping principles, or at times for being built on inappropriate locations outside of existing urban areas.

The move to rethink land-use planning and urban design has been strengthened by a wide variety of urban growth management efforts in North America, Europe, and elsewhere. These land-use planning initiatives have sought to deal with a problem unforeseen by early twentieth-century urban thinkers – rapid suburban sprawl made possible in large part by the automobile. In the United States, states such as Oregon, Vermont, Florida, and New Jersey first passed growth management legislation in the 1960s and 1970s, in some cases requiring local governments to plan urban growth boundaries (UGBs) or to limit expansion of urban services such as water and sewer utilities. Additional states such as Washington, Maryland, Massachusetts, Maine, and Pennsylvania launched initiatives in the 1980s and 1990s, often under the banner of "smart growth." The smart growth movement borrowed many principles from the New Urbanism but focusing also on reducing infrastructure costs and creating a fairer distribution of affordable housing. Smart growth efforts have been resisted by many local governments, landowners, developers, and property rights advocates. Libertarians and free-market economists have argued that people choose to live in automobile-oriented, sprawling suburbs, that compact development is not a cure for traffic congestion, and that supposedly sprawling cities such as Los Angeles actually have higher residential densities than do growth management models such as Portland. Growth management proponents reply that citizens have little choice but to live in sprawl, that the housing market has been distorted for many years by public and private subsidies for sprawl, that traffic can be reduced only through a combination of policies including better pricing and transportation alternatives as well as better land use, and that "sprawl" consists of many factors beyond sheer population density. For a good example of this debate see Peter Gordon and Harry Richardson's article "Are compact cities a desirable planning goal?" (*Journal of the American Planning Association*, 63(1), 1997, pp. 95–107) and Reid Ewing's response "Is Los Angeles-style sprawl desirable?" (same issue, pp. 107–127). Whatever the exact outcome of these arguments, it is clear to many these days that new approaches to physical planning are necessary for sustainable urban development.

Calthorpe, one of the leading New Urbanists, may be seen as an heir to Howard and Mumford in that through his regional and neighborhood planning work he has sought to develop a new version of the city-country balance. The co-editor (with ecological architect Sim Van der Ryn) of an earlier book entitled *Sus-*

tainable Communities (San Francisco: Sierra Club Books, 1986), Calthorpe later sought a more pragmatic synthesis of pedestrian-oriented planning principles that could be adopted by the mainstream development industry. In works such as *The Next American Metropolis* (Princeton, NJ: Princeton Architectural Press, 1993) and *The Regional City* (Washington, DC: Island Press, 2001; with William Fulton), he has sought to promote co-ordinated physical planning changes on neighborhood, city, and regional scales. Calthorpe has also been a leading proponent of "transit-oriented development," clustering communities around a regional network of rail transit stations.

One of the greatest contributions of Calthorpe and other New Urbanists has been to develop consensus on specific design guidelines and place-making strategies. Calthorpe's graphics in this book represent some of these principles. More are provided by other New Urbanist designers such as Duany, Plater-Zyberk, and Jeff Speck in their book *Suburban Nation* (New York: North Point Press, 2000), and by organizations such as the Congress for the New Urbanism (www.cnu.org), the Sacramento-based Local Government Commission (www.lgc.org), and the Smart Growth Network (www.smartgrowth.org).

Although he speaks primarily to an American audience and talks of redefining the "American Dream," it is important to realize that Calthorpe is talking about a mode of development which has become common the world over – a suburban world of cul-de-sacs, detached single-family houses, single-use zoning, and dependence on automobiles. This "dream" is now sought with increasing frequency in Indonesia, South Africa, The Netherlands, Mexico, eastern Europe, and countless other locations. Reasons for this include omnipresent American television, movies, and popular culture, the power of multinational corporations and their advertising to promote materialist lifestyles, and the employment of American planning consultants throughout the world.



The American Dream is an evolving image and the American Metropolis is its ever-changing reflection. The two feed one another in a complex, interactive cycle. At one point a dream moves us to a new vision of the city and community, at another the reflection of the city transforms that dream with harsh realities or alluring opportunities. We are at a point of transformation once again and the two, city and dream, are changing together. World War II created a distinct model for each: the nuclear family in the suburban landscape. That model and its physical expression is now stressed beyond retention. The family has grown more complex and diverse, while the suburban form has grown more demanding and less accessible. The need for change is blatant, with sprawl reaching its limits, communities fracturing into enclaves, and families seeking more inclusive identities. Clearly we need a new paradigm of development; a new vision of the American Metropolis and a new image for the American Dream.

The old suburban dream is increasingly out of sync with today's culture. Our household makeup has changed dramatically, the work place and work force have been transformed, average family wealth is shrinking, and serious environmental concerns³ have surfaced. But we continue to build

post-World War II suburbs as if families were large and had only one breadwinner, as if the jobs were all downtown, as if land and energy were endless, and as if another lane on the freeway would end traffic congestion.

Over the last 20 years these patterns of growth have become more and more dysfunctional. Finally they have come to produce environments which often frustrate rather than enhance everyday life. Suburban sprawl increases pollution, saps inner-city development, and generates enormous costs – costs which ultimately must be paid by taxpayers, consumers, businesses, and the environment. These problems are not to be solved by limiting the scope, program, or location of development – they must be resolved by rethinking the nature and quality of growth itself, in every context.

This book attempts to map out a new direction for growth in the American Metropolis. It borrows from many traditions and theories: from the romantic environmentalism of Ruskin to the City Beautiful Movement, from the medieval urbanism of Sitte to the Garden Cities of Europe, from streetcar suburbs to the traditional towns of America, and from the theories of Jane Jacobs to those of Leon Krier. It is a work which has evolved from theory to practice in some of our fastest

growing cities and regions. It is a search for a paradigm that combines the utopian ideal of an integrated and heterogeneous community with the realities of our time – the imperatives of ecology, affordability, equity, technology, and the relentless force of inertia. The work asserts that our communities must be designed to reestablish and reinforce the public domain, that our districts must be human-scaled, and that our neighborhoods must be diverse in use and population. And finally, that the form and identity of the metropolis must integrate historic context, unique ecologies, and a comprehensive regional structure.

The net result is that we need to start creating neighborhoods rather than subdivisions; urban quarters rather than isolated projects; and diverse communities rather than segregated master plans. Quite simply, we need towns rather than sprawl.

Settlement patterns are the physical foundation of our society and, like our society, they are becoming more and more fractured. Our developments and local zoning laws segregate age groups, income groups, and ethnic groups, as well as family types. Increasingly they isolate people and activities in an inefficient network of congestion and pollution – rather than joining them in diverse and human scaled communities. Our faith in government and the fundamental sense of commonality at the center of any vital democracy is seeping away in suburbs designed more for cars than people, more for market segments than communities. Special interest groups have now replaced citizens in the political landscape, just as gated subdivisions have replaced neighborhoods.

REDEFINING THE AMERICAN DREAM

It is time to redefine the American Dream. We must make it more accessible to our diverse population: singles, the working poor, the elderly, and the pressed middle-class families who can no longer afford the "Ozzie and Harriet" version of the good life. Certain traditional values – diversity, community, frugality, and human scale – should be the foundation of a new direction for both the American Dream and the American Metropolis. These values are not a retreat to nostalgia or imitation, but a recognition that certain qualities of culture and community are timeless. And that these timeless

imperatives must be married to the modern condition in new ways.

The alternative to sprawl is simple and timely: neighborhoods of housing, parks, and schools placed within walking distance of shops, civic services, jobs, and transit – a modern version of the traditional town. The convenience of the car and the opportunity to walk or use transit can be blended in an environment with local access for all the daily needs of a diverse community. It is a strategy which could preserve open space, support transit, reduce auto traffic, and create affordable neighborhoods. Applied at a regional scale, a network of such mixed-use neighborhoods could create order in our balkanized metropolis. It could balance inner-city development with suburban investment by organizing growth around an expanding transit system and setting defensible urban limit lines and greenbelts. The increments of growth in each neighborhood would be small, but the aggregate could accommodate regional growth with minimal environmental impacts; less land consumed, less traffic generated, less pollution produced.

Such neighborhoods, called Pedestrian Pockets or Transit-Oriented Developments, ultimately could be more affordable for working families, environmentally responsible, and cost-effective for business and government. But such a growth strategy will mean fundamentally changing our preconceptions and local regulatory priorities, as well as redesigning the federal programs that shape our cities.

At the core of this alternative, philosophically and practically, is the pedestrian. Pedestrians are the catalyst which makes the essential qualities of communities meaningful. They create the place and the time for casual encounters and the practical integration of diverse places and people. Without the pedestrian, a community's common ground – its parks, sidewalks, squares, and plazas – become useless obstructions to the car. Pedestrians are the lost measure of a community, they set the scale for both center and edge of our neighborhoods. Without the pedestrian, an area's focus can be easily lost. Commerce and civic uses are easily decentralized into distant chain store destinations and government centers. Homes and jobs are isolated in subdivisions and office parks.

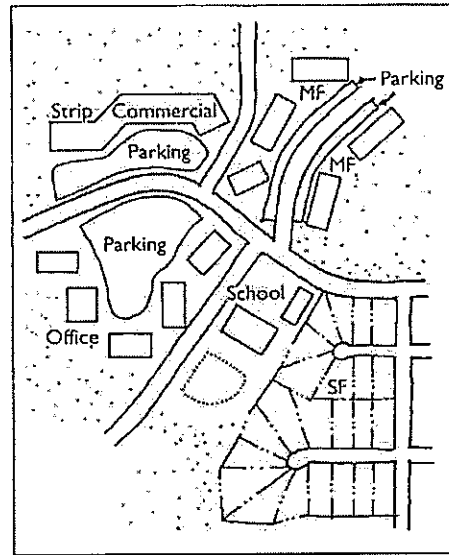
Although pedestrians will not displace the car anytime soon, their absence in our thinking and planning is a fundamental source of failure in our new

developments. To plan as if there were pedestrians may be a self-fulfilling act; it will give kids some autonomy, the elderly basic access, and others the choice to walk again. To plan as if there were pedestrians will turn suburbs into towns, projects into neighborhoods, and networks into communities.

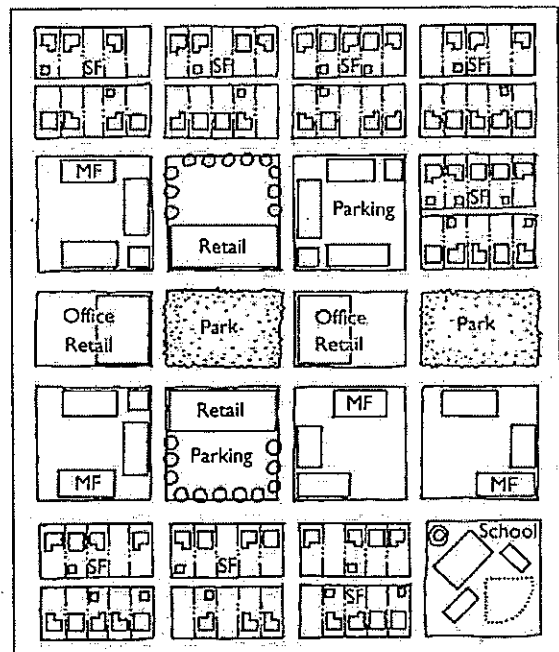
If we are now to reinvest in America, careful consideration should be given to what kind of America we want to create. Our investments in transit must be supported by land use patterns which put riders and jobs within an easy walk of stations. Our investments in affordable housing should place families in neighborhoods where they can save dollars by using their autos less. Our investments in open space should reinforce regional greenbelts and urban limit lines. Our investments in highways should not unwittingly support sprawl, inner-city disinvestments, or random job decentralization. Our investments in inner-cities and urban businesses ought to be linked by transit to the larger region, not isolated by gridlock. Our planning and zoning codes should help create communities, not sprawl.

Is such a transformation possible? Americans love their cars, they love privacy and independence, and they are evolving ever larger institutions. The goal of community planning for the pedestrian or transit is not to eliminate the car, but to balance it. In the 1970s the national love affair with the car was certainly hot, but we traveled on average 50 per cent fewer miles per year than we do now. It is possible to accommodate the car and still free pedestrians. Practically, it means narrowing local roads and placing parking to the rear of buildings, not eliminating access for the car. Similarly, the suburban goals of privacy and independence do not have to be abandoned in the interests of developing communities with vital urban centers and neighborly streets. In fact, a walkable neighborhood may produce increased independence for growing segments of the population, the elderly and kids. The scale of our institutions may no longer fit the human scale proportions of an old village, but with careful design they could be integrated into mixed-use communities. Large businesses are quickly becoming aware of the benefits of being part of a neighborhood rather than an office park, with shared amenities and local services topping the list.

This new balance calls for the integration of seemingly opposing forces. Community and privacy,



CONVENTIONAL SUBURBAN
DEVELOPMENT



TRADITIONAL NEIGHBORHOOD DEVELOPMENT

Figure 1. Conventional suburban development vs. traditional neighborhood development.

auto and pedestrian, large institution and small business, suburban and urban; these are the poles that must be fused in a new pattern of growth. The design imperatives of creating the post-suburban metropolis are complex and challenging. They are to develop a regional growth strategy which integrates social diversity, environmental protection, and transit; create an architecture that reinforces the public domain without sacrificing the variety and character of individual buildings; advance a planning approach that reestablishes the pedestrian in mixed-use, livable communities; and evolve a design philosophy that is capable of accommodating modern institutions without sacrificing human scale and memorable places.

DEFINITIONS

Transit-Oriented Development (TOD)

A Transit-Oriented Development (TOD) is a mixed-use community within an average 2,000-foot

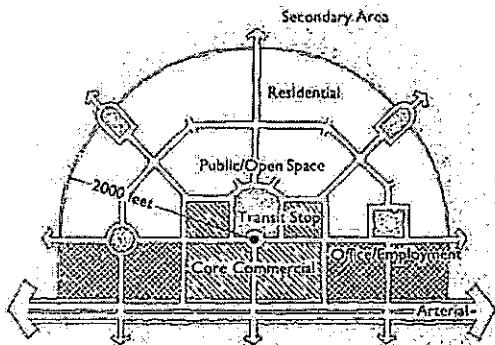


Figure 2. Transit-Oriented Development.

walking distance of a transit stop and core commercial area. TODs mix residential, retail, office, open space, and public uses in a walkable environment, making it convenient for residents and employees to travel by transit, bicycle, foot, or car.

Residential areas

TOD residential areas include housing that is within a convenient walking distance from core commercial areas and transit stops. Residential density requirements should be met with a mix of housing types, including small lot single-family, townhomes, condominiums, and apartments.

Secondary areas

Each TOD may have a Secondary Area adjacent to it, including areas across an arterial, which are no further than one mile from the core commercial area. The Secondary Area street network must provide multiple direct street and bicycle connections to the transit stop and core commercial area, with a minimum of arterial crossings. Secondary Areas may have lower density single-family housing, public schools, large community parks, low intensity employment-generating uses, and park-and-ride lots.

Relationship to transit and circulation

The site must be located on an existing or planned trunk transit line or on a feeder bus route within 10 minutes transit travel time from a stop on the trunk line. Where transit may not occur for a period

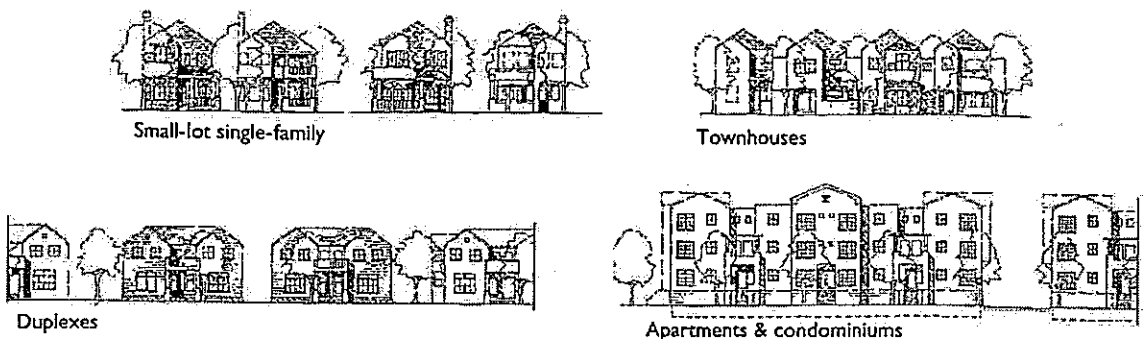


Figure 3. Housing types.

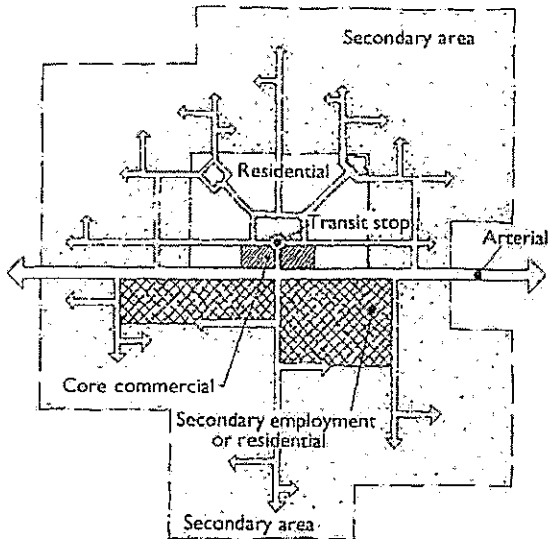


Figure 4. Secondary areas.

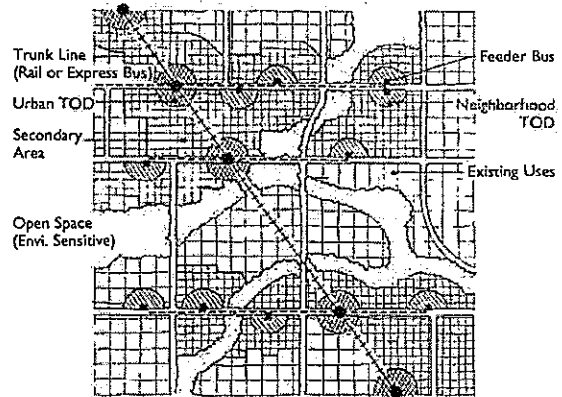


Figure 5. Relationship to transit.

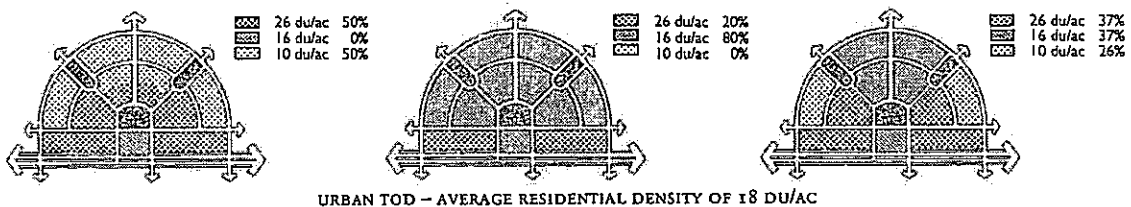


Figure 6. Residential density mix.

of time, the land use and street patterns within a TOD must function effectively in the interim.

to 62 units/hectare), depending on the relationship to surrounding existing neighborhoods and location within the urban area.

Residential mix

A mix of housing densities, ownership patterns, price, and building types is desirable in a TOD. Average minimum densities should vary between 10 and 25 dwelling units/net residential acre (25

Street and circulation system

The local street system should be recognizable, formalized, and inter-connected, converging to transit stops, core commercial areas, schools, and

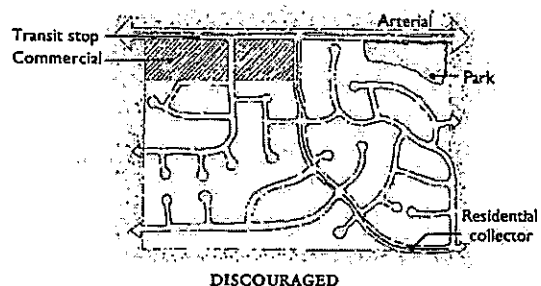
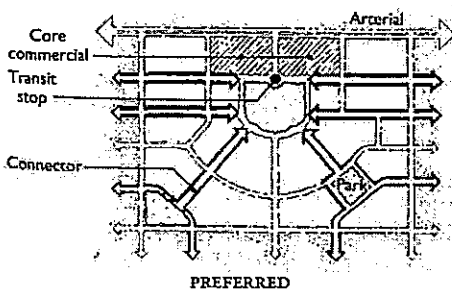


Figure 7. Street and circulation system.

parks. Multiple and parallel routes must be provided between the core commercial area, residential, and employment uses so that local trips are not forced onto arterial streets. Streets must be pedestrian friendly; sidewalks, street trees, building entries, and parallel parking must shelter and enhance the walking environment.

Regional form

Regional form should be the product of transit accessibility and environmental constraints. Major natural resources, such as rivers, bays, ridgelines, agriculture, and sensitive habitat should be preserved and enhanced. An Urban Growth Boundary should be established that provides adequate area for growth while honoring these criteria.

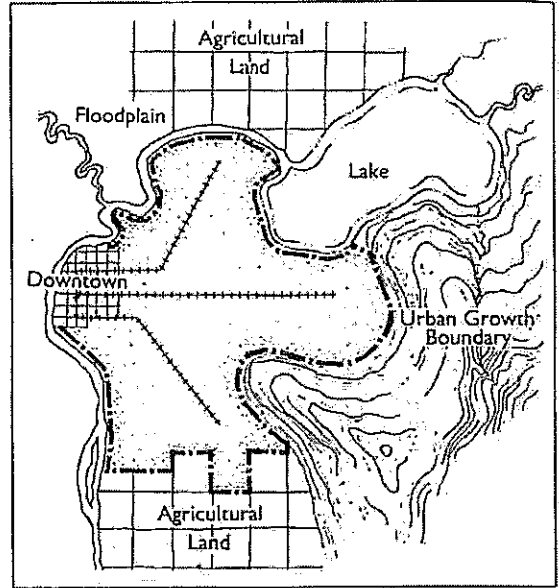


Figure 8. Regional form.



"Outdoor Space and Outdoor Activities"

from *Life Between Buildings* (1980)

Jan Gehl

Editors' Introduction



Beginning in the 1960s writers such as Jacobs, Lynch, William H. Whyte, Clare Cooper Marcus, and Danish designer Jan Gehl emphasized the need to base urban design on study of how people actually experience and use urban environments. A new discipline of environmental design emerged, devoted to researching how built environments work for people. Researchers developed methods using behavior observation, time-lapse photography, post-occupancy evaluation surveys, and cognitive mapping (in which people were asked to draw maps or images of how they perceived their urban environments) to provide factual information for improved urban design.

In his pioneering book *Life Between Buildings: Using Public Space* (New York: Van Nostrand Reinhold, 1980), Gehl took a remarkably perceptive look at different types of outdoor spaces and their social uses. What is most needed, he argued, is an increase in optional activities taking place in the public realm. The number and variety of human interactions, especially chance meetings in public spaces, was in his view the way to a healthier urban community. Analyzing public spaces within Copenhagen, he found places such as the Stroget (one of Europe's pioneering pedestrian streets) and the Tivoli Gardens particularly conducive to social life. Although many of Gehl's observations may seem common sense today, they represented a major departure from modernist urban design practices in which abstract architectural principles, rather than careful observation of how people actually use places, often dictated urban form. Other books in this vein include Whyte's *The Social Life of Small Urban Spaces* (Washington, DC: The Conservation Foundation, 1980), Marcus and Wendy Sarkissian's *Housing as if People Mattered*, Marcus and Carolyn Francis' *People Places* (New York: Van Nostrand Reinhold, 1990), and Lynch's *The Image of the City* (Cambridge, MA: MIT Press, 1960).

Photo by [unclear]

THREE TYPES OF OUTDOOR ACTIVITIES

An ordinary day on an ordinary street. Pedestrians pass on the sidewalks, children play near front doors, people sit on benches and steps, the postman makes his rounds with the mail, two passersby greet on the sidewalk, two mechanics

repair a car, groups engage in conversation. This mix of outdoor activities is influenced by a number of conditions. Physical environment is one of the factors: a factor that influences the activities to a varying degree and in many different ways. Outdoor activities, and a number of the physical conditions that influence them, are the subject of this book.

Greatly simplified, outdoor activities in public spaces can be divided into three categories, each of which places very different demands on the physical environment: *necessary activities*, *optional activities*, and *social activities*.

Necessary activities include those that are more or less compulsory – going to school or to work, shopping, waiting for a bus or a person, running errands, distributing mail – in other words, all activities in which those involved are to a greater or lesser degree required to participate.

In general, everyday tasks and pastimes belong to this group. Among other activities, this group includes the great majority of those related to walking.

Because the activities in this group are necessary, their incidence is influenced only slightly by the physical framework. These activities will take place throughout the year, under nearly all conditions, and are more or less independent of the exterior environment. The participants have no choice.

Optional activities – that is, those pursuits that are participated in if there is a wish to do so and if time and place make it possible – are quite another matter.

This category includes such activities as taking a walk to get a breath of fresh air, standing around enjoying life, or sitting and sunbathing.

These activities take place only when exterior conditions are optimal, when weather and place invite them. This relationship is particularly important in connection with physical planning because most of the recreational activities that are especially pleasant to pursue outdoors are found precisely in this category of activities. These activities are especially dependent on exterior physical conditions.

When outdoor areas are of poor quality, only strictly necessary activities occur.

When outdoor areas are of high quality, necessary activities take place with approximately the same frequency – though they clearly tend to take a longer time, because the physical conditions are better. In addition, however, a wide range of optional activities will also occur because place and situation now invite people to stop, sit, eat, plan, and so on.

In streets and city spaces of poor quality, only the bare minimum of activity takes place. People hurry home.

In a good environment, a completely different, broad spectrum of human activities is possible.

	Quality of the physical environment	
	Poor	Good
Necessary activities	●	●
Optional activities	•	●●●●●
"Resultant" activities (Social activities)	•	●●●●●

Figure 1. Graphic representation of the relationship between the quality of outdoor spaces and the rate of occurrence of outdoor activities. When the quality of outdoor areas is good, optional activities occur with increasing frequency. Furthermore, as levels of optional activity rise, the number of social activities usually increases substantially.

Social activities are all activities that depend on the presence of others in public spaces. Social activities include children at play, greetings and conversations, communal activities of various kinds, and finally – as the most widespread social activity – passive contacts, that is simply seeing and hearing other people.

Different kinds of social activities occur in many places: in dwellings; in private outdoor spaces, gardens, and balconies; in public buildings; at places of work; and so on; but in this context only those activities that occur in publicly accessible spaces are examined.

These activities could also be termed "resultant" activities, because in nearly all instances they evolve from activities linked to the other two activity categories. They develop in connection with the other activities because people are in the same space, meet, pass by one another, or are merely within view. . . .

[...]

LIFE BETWEEN BUILDINGS

It is difficult to pinpoint precisely what life between buildings means in relation to the *need for contact*.

Opportunities for meetings and daily activities in the public spaces of a city or residential area enable one to be among, to see, and to hear others, to experience other people functioning in various situations.

These modest "see and hear contacts" must be considered in relation to other forms of contact and as part of the whole range of social activities, from very simple and noncommittal contacts to complex and emotionally involved connections.

The concept of varying degrees of contact intensity is the basis of the following simplified outline of various contact forms:

High intensity	↑	Close friendships
		Friends
		Acquaintances
		Chance contacts
Low intensity	↓	Passive contacts ("see and hear" contacts)

In terms of this outline life between buildings represents primarily the low-intensity contacts located at the bottom of the scale. Compared with the other contact forms, these contacts appear insignificant, yet they are valuable both as independent contact forms and as prerequisites for other, more complex interactions.

Opportunities related to merely being able to meet, see, and hear others include:

- contact at a modest level
- a possible starting point for contact at other levels
- a possibility for maintaining already established contacts
- a source of information about the social world outside
- a source of inspiration, an offer of stimulating experience.

The possibilities related to the low-intensity contact forms offered in public spaces perhaps can best be described by the situation that exists if they are lacking.

If activity between buildings is missing, the lower end of the contact scale also disappears. The varied transitional forms between being alone and being together have disappeared. The boundaries between isolation and contact become sharper —

people are either alone or else with others on a relatively demanding and exacting level.

Life between buildings offers an opportunity to be with others in a relaxed and undemanding way. One can take occasional walks, perhaps make a detour along a main street on the way more or pause at an inviting bench near a front door to be among people for a short while. One can take a long bus ride every day, as many retired people have been found to do in large cities. Or one can do daily shopping, even that it would be more practical to do it once a week. Even looking out of the window now and then, if one is fortunate to have something to look at, can be rewarding. Being among others, seeing and hearing others, receiving impulses from others, imply positive experiences, alternatives to being alone. One is not necessarily with a specific person, but one is, nevertheless, with others.

As opposed to being a passive observer of other people's experiences on television or video or film, in public spaces the individual himself is present, participating in a modest way, but most definitely participating.

Low-intensity contact is also a situation from which other forms of contact can grow. It is a medium for the unpredictable, the spontaneous, the unplanned. . . .

[...]

The trend from living in lifeless cities and residential areas that has accompanied industrialization, segregation of various city functions, and reliance on the automobile also has caused cities to become duller and more monotonous. This points up another important need, namely *the need for stimulation*.

Experiencing other people represents a particularly colorful and attractive opportunity for stimulation. Compared with experiencing buildings and other inanimate objects, experiencing people, who speak and move about, offers a wealth of sensual variation. No moment is like the previous or the following when people circulate among people. The number of new situations and new stimuli is limitless. Furthermore it concerns the most important subject in life: people.

Living cities, therefore, ones in which people can act with one another, are always stimulating because they are rich in experiences, in contrast to lifeless cities, which can scarcely avoid being poor in experiences and thus dull, no matter how many

colors and variations of shape in buildings are introduced. . . .

[...]

OUTDOOR ACTIVITIES AND THE QUALITY OF OUTDOOR SPACE

Life between buildings is discussed here because the extent and character of outdoor activities are greatly influenced by physical planning. Just as it is possible through choice of materials and colors to create a certain palette in a city, it is equally possible through planning decisions to influence patterns of activities, to create better or worse conditions for outdoor events, and to create lively or lifeless cities.

The spectrum of possibilities can be described by two extremes. One extreme is the city with multistory buildings, underground parking facilities, extensive automobile traffic, and long distances between buildings and functions. This type of city can be found in a number of North American and "modernized" European cities and in many suburban areas.

In such cities one sees buildings and cars, but few people, if any, because pedestrian traffic is more or less impossible, and because conditions for outdoor stays in the public areas near buildings are very poor. Outdoor spaces are large and impersonal. With great distances in the urban plan, there is nothing much to experience outdoors, and the few activities that do take place are spread out in time and space. Under these conditions most residents prefer to remain indoors in front of the television or on their balcony or in other comparably private outdoor spaces.

Another extreme is the city with reasonably low, closely spaced buildings, accommodation for foot traffic, and good areas for outdoor stays along the streets and in direct relation to residences, public buildings, places of work, and so forth. Here it is possible to see buildings, people coming and going, and people stopping in outdoor areas near the buildings because the outdoor spaces are easy

and inviting to use. This city is a living city, one in which spaces inside buildings are supplemented with usable outdoor areas, and where public spaces are allowed to function. . . .

In a survey recording all activities occurring in the center of Copenhagen during the spring and summer of 1986, it was found that the number of pedestrian streets and squares in the city center had tripled between 1968 and 1986. Parallel to this improvement of the physical conditions, a tripling in the number of people standing and sitting was recorded.

In cases where neighboring cities offer varying conditions for city activities, great differences can also be found.

In Italian cities with pedestrian streets and automobile-free squares, the outdoor city life is often much more pronounced than in the car-oriented neighboring cities, even though the climate is the same.

A 1978 survey of street activities in both trafficked and pedestrian streets in Sydney, Melbourne, and Adelaide, Australia, carried out by architectural students from the University of Melbourne and the Royal Melbourne Institute of Technology found a direct connection between street quality and street activity. In addition, an experimental improvement of increasing the number of seats by 100 per cent on the pedestrian street in Melbourne resulted in an 88 per cent increase in seated activities.

William H. Whyte, in his book *The Social Life of Small Urban Spaces*, describes the close connection between qualities of city space and city activities and documents how often quite simple physical alterations can improve the use of the city space noticeably.

Comparable results have been achieved in a number of improvement projects executed in New York and other US cities by the Project for Public Spaces.

In residential areas as well, both in Europe and the United States, traffic reduction schemes, courtyard clearing, laying out of parks, and comparable outdoor improvements have had a marked effect.



Plate 1. A sociable street in Copenhagen.

TRANSPORTATION





"Transit and the Metropolis: Finding Harmony"

from *The Transit Metropolis: A Global Inquiry* (1998)

Robert Cervero

Editors' Introduction



Rising traffic volume and congestion are leading citizen concerns in most cities and towns the world over, and of course produce other sustainability-related problems such as air pollution, greenhouse gas emissions, depletion of nonrenewable fossil fuels, destruction of open space by roads and suburban sprawl, and degradation of local neighborhood quality of life. Vehicle ownership continues to grow rapidly in most countries, and the number of miles driven per capita has doubled in nations such as the USA over the last generation. How can this situation ever be changed? While there is no easy answer to this question, a number of combined strategies involving land use, public transit, other alternative travel modes, and pricing are likely to make the difference. This chapter explores some of these areas crucial to improving urban sustainability.

University of California at Berkeley professor Robert Cervero has studied relationships between transportation and land use the world over and is a leading authority on strategies to reduce automobile use. In this selection from his book *The Transit Metropolis: A Global Inquiry* (Washington, DC: Island Press, 1998), he asks why automobile use continues to grow and public transit use decline, and what characteristics can lead urban regions to buck this trend. Solutions, he believes, can be of several sorts. Regions may adapt their land use to fit around major transit systems such as subways or light rail lines ("adaptive cities"). Or they might adapt their transit systems to fit their low-density land use by employing on-demand shuttles and vans and/or flexible bus systems ("adaptive transit"). Or various hybrid options are possible. Pricing of transportation and other "transportation demand management" policies will play a role as well. The long-term goal, in Cervero's view, is the "transit metropolis" where strong public transit alternatives exist to balance private vehicle use.

Other resources on the subject of reducing automobile use include Peter Newman and Jeffrey Kenworthy's *Sustainability and Cities: Overcoming Automobile Dependence* (Washington, DC: Island Press, 1999; excerpted later in Part 2), Anthony Downs' *Stuck in Traffic: Coping With Peak-Hour Traffic Congestion* (Washington, DC: The Brookings Institution, 1992), and David Engwicht's *Reclaiming Our Cities & Towns: Better Living with Less Traffic* (Philadelphia: New Society Publishers, 1993). Two excellent internet resources on transportation are the Surface Transportation Policy Project (www.transact.org) and the Victoria Transportation Policy Institute (www.vtpi.org), both of which offer an impressive array of materials on transportation policy and how it might be reformed.

Public transit systems are struggling to compete with the private automobile the world over. Throughout North America, in much of Europe, and even in most developing countries, the private automobile continues to gain market shares of motorized trips at the expense of public transit systems. In the United States, just 1.8 per cent of all person trips were by transit in 1995, down from 2.4 per cent in 1977 and 2.2 per cent in 1983.¹ Despite the tens of billions of dollars invested in new rail systems and the underwriting of more than 75 per cent of operating expenses, ridership figures for transit's bread-and-butter market – the work trip – remain flat. Nationwide, 4.5 per cent of commutes were by transit in 1983; by 1995, this share had fallen to 3.5 per cent.

The declining role of transit has been every bit as alarming in Europe, prompting some observers to warn that it is just a matter of time before cities like London and Madrid become as automobile-oriented as Los Angeles and Dallas. England and Wales saw the share of total journeys by transit fall from 33 per cent in 1971 to 14 per cent in 1991.² Since 1980, transit's market shares of trips have plummeted in Italy, Poland, Hungary, and former East Germany. Eroding market shares have likewise been reported in such megacities as Buenos Aires, Bangkok, and Manila.

Numerous factors have fueled these trends. Part of the explanation for the decline in Europe has been sharp increases in fares resulting from government deregulation of the transit sector. Public disinvestment has left the physical infrastructure of some transit systems in shambles in Italy and parts of Eastern Europe. However, transit's decline has been more an outcome of powerful spatial and economic trends that have been unfolding over the past several decades than of overt government actions (or inaction). Factors that have steadily chipped away at transit's market share worldwide include rising personal incomes and car ownership, declining real-dollar costs for motoring and parking, and the decentralization of cities and regions. Of course, these forces have partly fed off each other. Rising wealth and cheaper motoring, for instance, have prompted firms, retailers, and households to exit cities in favor of less dense environs. Spread-out development has proven to be especially troubling for mass transit. With trip origins and destinations today spread all

over the map, mass transit is often no match for the private automobile and its flexible, door-to-door, no-transfer features.

Suburbanization has not crippled transit systems everywhere, however. Some cities and regions have managed to buck the trend, offering transit services that are holding their own against the automobile's ever-increasing presence, and in some cases even grabbing larger market shares of urban travel. These are places, I contend, that have been superbly adaptive, almost in a Darwinian sense. Notably, they have found a harmonious fit between mass transit services and their cityscapes.

Some, like Singapore and Copenhagen, have adapted their settlement patterns so that they are more conducive to transit riding, mainly by rail transit, whether for reasons of land scarcity, open space preservation, or encouraging what are viewed as more sustainable patterns of growth and travel. This has often involved concentrating offices, homes, and shops around rail nodes in attractive, well-designed, pedestrian-friendly communities. Other places have opted for an entirely different approach, accepting their low-density, often market-driven lay of the land, and in response adapting mass transit services and technologies to better serve these spread-out environs. These are places, such as Karlsruhe in Germany and Adelaide, Australia, that have introduced flexible forms of mass transit that begin to emulate the speedy, door-to-door service features of the car.

Still other places, like Ottawa, Canada, and Curitiba, Brazil, have struck a middle ground, adapting their urban landscapes so as to become more transit-supportive while at the same time adapting their transit services so as to deliver customers closer to their destinations, minimize waits, and expedite transfers. It is because these places have found a workable nexus between their mass transit services and urban settlement patterns that they either are or are on the road to becoming great transit metropolises.

What these areas have in common – adaptability – is first and fundamentally a calculated process of making change by investing, reinvesting, organizing, reorganizing, inventing, and reinventing. Adaptability is about self-survival in a world of limited resources, tightly stretched budgets, and

ever-changing cultural norms, lifestyles, technologies, and personal values. In the private sector, any business that resists adapting to changing consumer wants and preferences is a short-lived business. More and more, the public sector is being held to similar standards. There is no longer the public largesse or patience to allow business as usual. Transit authorities must adapt to change, as must city and regional governments. Trends like suburbanization, advances in telecommunications, and chained trip-making require that transit agencies refashion how they configure and deliver services and that builders and planners adjust their designs of communities and places. In the best of worlds, these efforts are closely coordinated. This will most likely occur when and where there is the motivation and the means to break out of traditional, entrenched practices, which, of course, is no small feat in the public realm. Yet even transit's most ardent defenders now concede that steadily eroding shares of metropolitan travel are a telltale sign that fresh, new approaches are needed. Places that appropriately adapt to changing times, I contend, are places where transit stands the best chance of competing with the car well into the next millennium.

It bears noting that a functional and sustainable transit metropolis is not equated with a region whereby transit largely replaces the private automobile or even captures the majority of motorized trips. Rather, the transit metropolis represents a built form and a mobility environment where transit is a far more respectable alternative to traveling than currently is the case in much of the industrialized world. It is an environment where transit and the built environment harmoniously co-exist, reinforcing and enhancing each other in the process. Thus, while automobile travel might still predominate, a transit metropolis is one where enough travelers opt for transit riding, by virtue of the workable transit-land use nexus, to place a region on a sustainable course.

It is also important to emphasize... connections between transit and urbanization at the regional scale versus the local one. While considerable attention has been given to transit-oriented development (TOD) and the New Urbanism movement in recent years, both by scholars and the popular press, much of this focus has been at the neighborhood and community levels. Micro-scale

designs that encourage walking and promote community cohesion have captivated the attention of many proponents of TODs and New Urbanism. While good quality designs are without question absolutely essential to creating places that are physically conducive to transit riding, they are clearly not sufficient in and of themselves. Islands of TOD in a sea of freeway-oriented suburbs will do little to change fundamental travel behavior or the sum quality of regional living. The key to making TOD work is to make sure that it is well coordinated across a metropolis. While land use planning and urban design are local prerogatives, their impacts on travel are felt regionally. ...

[...]

TYPES OF TRANSIT METROPOLES

[There are] four classes of transit metropolises:

- *Adaptive cities.* These are transit-oriented metropolises that have invested in rail systems to guide urban growth for purposes of achieving larger societal objectives, such as preserving open space and producing affordable housing in rail-served communities. All feature compact, mixed-use suburban communities and new towns concentrated around rail nodes ... examples are Stockholm, Copenhagen, Tokyo, and Singapore.
- *Adaptive transit.* These are places that have largely accepted spread-out, low-density patterns of growth and have sought to appropriately adapt transit services and new technologies to best serve these environs. [Models include] technology-based examples (e.g. dual-track systems in Karlsruhe, Germany), service innovations (e.g. track-guided buses in Adelaide, Australia), and small-vehicle, entrepreneurial services (e.g. colectivos in greater Mexico City).
- *Strong-core cities.* [Cities such as] Zurich and Melbourne have successfully integrated transit and urban development within a more confined, central city context. They have done so by providing integrated transit services centered around mixed-traffic tram and light rail systems. In these places, trams designed into streetscapes co-exist nicely with pedestrians and bicyclists. These cities' primacies (high



shares of regional jobs and retail sales in their cores) and healthy transit patronage are testaments to the success of melding together the renewal of both central city districts and traditional tramways.

- *Hybrids: adaptive cities and adaptive transit.* [Cities such as] Munich, Ottawa, and Curitiba are best viewed as hybrids, in the sense that they have struck a workable balance between concentrating development along mainline transit corridors and adapting transit to efficiently serve their spread-out suburbs and exurbs. Greater Munich's hybrid of heavy rail trunkline services and light rail and conventional bus feeders – all coordinated through a regional transit authority – has strengthened the central city while also serving suburban growth axes. Both Ottawa and Curitiba have introduced flexible transit centered around dedicated busways, and at the same time have targeted considerable shares of regional commercial growth around key busway stations. The combination of flexible bus-based services and mixed-use development along busway corridors has given rise to unusually high per capita transit ridership rates in both cities.

[...]

TRANSIT SERVICES AND TECHNOLOGIES

I have opted for the term *transit* to describe generically the collective forms of passenger-carrying transportation services – ranging from vans and minibuses serving multiple origins and destinations (many-to-many) over nonfixed routes to modern, heavy rail trains operating point to point (one-to-one) over fixed guideways. *Transit* is the catchall used in the United States and Canada; however, almost everywhere else, *public transport* is the vernacular. And while in much of North America, *public transport* or *public transit* is associated with mass transit services provided by the public sector, almost everywhere else it means services that are available to the public at large, whether publicly or privately deployed. It is this broader, more inclusive definition of public transport that is adopted [here].

Types or classes of transit services can be defined along a continuum according to types of vehicles, passenger-carrying capacities, and operating environments. The following sections elaborate on the forms of common-carrier transit services – i.e., those available to the general public. . . .

Paratransit

The smallest carriers often go by the name of *paratransit*, representing the spectrum of vans, jitneys, shuttles, minibuses, and minibuses that fall between the private automobile and conventional bus in terms of capacities and service features. Often owned and operated by private companies and individuals, paratransit services tend to be flexible and highly market-responsive, connecting multiple passengers to multiple destinations within a region, sometimes door-to-door and, because of multiple occupants, at a price below a taxi (but enough to more than cover full operating costs). Driven by the profit motive, paratransit entrepreneurs aggressively seek out new and expanding markets, innovating when and where necessary. Much of their success lies in their flexibility and adaptability. Unencumbered by strict operating rules, jitney drivers will sometimes make a slight detour to deliver someone hauling groceries to his or her front door in return for an extra charge. Besides being more human-scale, jitneys and minibuses can offer service advantages over bigger buses – often, they take less time to load and unload, arrive more frequently, stop less often, and are more maneuverable in busy traffic, and, studies show, passengers tend to feel more secure since each one is closer to the driver.³

In many parts of the developing world, jitneys and minibuses are the mainstays of the transit network. The archetypal service consists of a constellation of loosely regulated owner-operated collective-ride vehicles that follow more or less fixed routes with some deviations as custom, traffic, and hour of day permit. Jitney drivers respond to curbside hails pretty much anywhere along a route. Every paratransit system, however – whether the 2,000 *matatus* of Nairobi, the 15,000 *carros por puesto* minibuses in Caracas, or the 40,000-plus jeepneys

of Manila – differs in some way. Some load customers in the rear of vehicles and others on the side; some are governed by federations of jitney owners while others engage in daily head-to-head competition; some have comfortable padded seats and others have hard wooden benches. Manila's jeepneys (converted US army jeeps that serve up to twelve riders on semifixed routes) carry about 60 per cent of all peak-period trips in the region. They cost 16 per cent less per seat mile than standard buses and generally provide a higher quality service (e.g., greater reliability, shorter waits) at a lower fare. Jeepney operations have historically been the last to petition for fare increases.⁴

Although banned in most wealthy countries, a handful of US cities today allow private minibuses and jitney operators to ply their trade as long as they meet minimum safety and insurance requirements. New York City has the largest number of privately operated van services of any American city – an estimated 3,000 to 5,000 vehicles (seating 14 to 20 passengers) operate, both legally and illegally, on semifixed routes and variable schedules to subway stops and as connectors to Manhattan. Surveys show that more than three-quarters of New York's commuter van customers are former transit riders who value having a guaranteed seat and speedy, dependable services. Miami also has a thriving paratransit sector that caters mainly to recent immigrants from Cuba and the West Indies who find jitney-vans a more familiar and congenial form of travel than buses. Today, virtually all US cities allow private shuttle vans to serve airports.

Studies consistently show that jitneys and minibuses, whether in United States or Southeast Asia, confer substantial economic and financial benefits, both to the public sector and to private operators – namely, they are more effective at coaxing motorists out of cars than conventional transit in many settings, and do so without costly public subsidies.⁵ However, as passenger volumes rise above a certain threshold (usually 4,000 or more per direction per hour), the economic advantages of paratransit begin to plummet, reflecting the limitations of smaller vehicles in carrying large line-haul loads. In both the developing and developed worlds, paratransit best operates in a supporting and supplement rather than substituting, role.

Bus transit

Urban *bus transit* services come in all shapes and sizes, but in most places they are characterized by 45- to 55-passenger pneumatic-tire coaches that ply fixed routes on fixed schedules. Buses are usually diesel propelled, though in some larger metropolises (e.g., Mexico City, Toronto), electric trolley buses powered by overhead wires also operate. Because they share road space, buses tend to be cheaper and more adaptive than rail services. However, on a per passenger kilometer basis, bus transit is generally a less efficient user of energy and emits more pollution than urban rail services. It is partly because of environmental concerns, as well as image consciousness, that some cities have sought to trade in their bus routes for urban rail services.

Bus transit is particularly important in developing countries, such as India, where some 40 per cent of all urban trips are by bus. In the Third World, the private sector serves more than 75 per cent of bus trips. In Karachi, Pakistan, private enterprises operating medium-size buses handle 82 per cent of transit journeys.⁶ Because they are highly vulnerable to traffic congestion, buses are notoriously slow in megacities such as Shanghai, China, where it is generally faster to pedal a bike for trips under 14 kilometers in length.⁷ One remedy is to reward high-occupancy travel through preferential treatment, such as reserved bus lanes and traffic signal preemptions. Bangkok, Thailand, has opened some 200 kilometers of reserved, contra-flow bus lanes to expedite bus flows in a city where rush-hour speeds often fall below 10 kilometers per hour.

In most developed countries, bus transit falls largely under the domain of the public sector, though concerns over rising subsidies have prompted more and more public transit agencies to competitively tender services to private contractors. In much of the United Kingdom and Scandinavia, public bus services have been turned over to the private sector outright. For many small to medium-size metropolitan areas of the United States, Canada, and Europe, conventional coaches (operating over fixed routes on published schedules) are the predominant transit carriers; in larger areas, buses often function mainly as feeders into mainline rail corridors. Providing exclusive

busways can allow buses to integrate feeder and line-haul functions in a single vehicle. In... Ottawa and Curitiba, dedicated passageways are provided for buses, enabling rubber-tire vehicles to emulate the speed advantages of conventional steel-wheel trains on line-haul segments, yet perform as regular buses on surface streets as well. Guided busways, or O-Bahns, introduced so far in Essen, Germany; Adelaide, Australia; and two British cities, Leeds and Ipswich, are particularly suited to corridors (such as freeway medians) with restricted right-of-ways. Because of faster operating speeds, the theoretical maximum passenger throughputs of busways are as high as 20,000 persons per direction per hour, more than twice that of conventional surface-street buses.⁸

Trams and light rail transit

Rail transit systems are mass transit's equivalents to motorized expressways, providing fast, trunkline connections between central business districts, secondary activity centers, and suburban corridors. The oldest and slowest rail services – *streetcars* in the United States and *tramways* in Europe – functioned as mainline carriers in an earlier era, but as metropolitan areas grew outward, those that remained intact were relegated to the role of central city circulators. In cities such as Zurich, Munich, and Melbourne, aging tramways have been refurbished in recent times to improve vehicle comfort, safety, and maneuverability. Trams are enjoying a renaissance in a number of European cities because their slower speeds, street-scale operations, and Old World character blend nicely with a pedestrian-oriented, car-free central city.

The modern-day version of the electric streetcar, *light rail transit* (LRT), has gained popularity as a more affordable alternative to expensive heavy rail systems, particularly in medium-size metropolitan areas of under 3 million population. Compared to tram services, LRT generally operates along exclusive or semi-exclusive right-of-ways using modern, automated train controls and technologies. The LRT vehicles tend to be roomier and more comfortable than tram cars, with more head clearance and lower floors. In the United States, where the most LRT trackage has been laid since the early 1980s, costs are often saved by building along

disused railroad corridors. Medium-size US cities with fairly low densities, such as Sacramento, California, have managed to build LRT for as low as US\$ 10 million per route mile; in Sacramento's case, costs were slashed by sharing a freight railroad right-of-way, building no-frills side-platform stations, and relying predominantly on single-track services. Light rail transit is generally considered safer than heavy rail because electricity comes from an overhead wire instead of a middle third rail. There is thus no need to fence in the track, not only saving costs but also allowing LRT cars to mix with traffic on city streets.

Today there are more than 100 tramways and LRT systems worldwide (mostly in Europe and North America), with the number continually rising. Among the factors behind the growing popularity of LRT and refurbished tramways are their lower costs relative to heavy rail investments and their ability to adapt to the streetscapes of built-up areas without much disruption. Other advantages include: they operate relatively quietly, thus are fairly environmentally benign and unobtrusive; they are electrically propelled, thus are less dependent than buses on the availability of petrochemical fuels; and they can be developed incrementally, a few miles at a time, eliminating the need for the long lead times associated with heavy rail construction.

... With four-car trains running as closely as three minutes apart, LRT can carry some 11,000 passengers per direction per hour; cutting the headways to ninety seconds (as found in some German cities, including Karlsruhe), maximum capacity can be doubled to more than 20,000. Advanced light rail transit (ALRT) systems – such as the skytrains in Vancouver, Toronto, and London's Docklands propelled by linear induction motors – can accommodate more than 25,000 passengers per direction per hour because of their higher engineering and design standards (though automated train control in lieu of on-board drivers constrains carrying capacities). It is for this reason they are also called intermediate capacity transit systems (ICTS).

Heavy rail and metros

In the world's largest cities, the big-volume transit carriers are the *heavy rail* systems, also called *rapid rail transit*, and known as *metros* in Europe,

Asia, and Latin America. Metros . . . work best in large, dense cities. Indeed, the relationship is symbiotic. The densities found on Hong Kong's Victoria Island and New York's Manhattan Island could not be sustained without heavy rail services. And heavy rail service could not be sustained without very high densities. Presently, more than 90 per cent of all peak-period trips to and from central London are by transit, mainly via the underground "tube"; for the remainder of greater London, transit serves fewer than a quarter of all peak-hour trips.⁹

Today, worldwide, there are some 80 metro systems, including 27 in Europe, 17 in Asia, 17 in the former Soviet Union, 12 in North America, seven in Latin America, and one in Africa. Some metros have been enormously successful, including Moscow's and Tokyo's, each of which carries 2.6 billion to 2.8 billion customers a year, more than twice as many as London's or Paris's metro systems, both of which are double the size of Moscow's and Tokyo's. On a riders per track kilometer basis, the world's most intensively used metros are, in order, São Paulo, Moscow, Tokyo, St Petersburg, Osaka, Hong Kong, and Mexico City. Most Western European, Canadian, and US metros have one-third to one-quarter the passenger throughput per track kilometer of these cities, in large part because more of their residents own cars and the cost of driving is relatively low.

In contrast to light rail systems, few new metros are being built today, partly for fiscal reasons and partly because most areas that can economically justify the costly outlays already have them. Except for Southern California, no new heavy rail lines or extensions are being planned, designed, or constructed in North America. The World Bank lending for metro systems ceased completely in 1980 and has resumed again only recently. The Bank generally frowns on funding rail projects, even in megacities paralyzed by traffic congestion, viewing them as cost-ineffective means of achieving the Bank's principal missions of alleviating poverty and stimulating economic growth.¹⁰

The niche market of heavy rail services is high-volume, mainline corridors. Accommodating more than 50,000 passengers per hour in each direction, heavy rail services provide high-speed, high-performance connections within built-up cities as well as between outlying areas and central business

districts. In city cores, heavy rail systems almost always operate below ground, thus the names undergrounds (in Great Britain and its former colonies) and subways. To justify the high costs for right-of-way acquisitions, relocations, and excavation, undergrounds require very high traffic volumes (toward the upper end of the capacity threshold). Outside the core, metro lines are normally either above ground (called elevated or aerial alignments) or at-grade within expressway medians. Most heavy rail stations are far more substantial and sited farther apart than LRT stops, usually two or more kilometers from each other, except in downtowns, where they might be three or four blocks away. Because heavy rail systems are often the most expansive metropolitan rail services and operate at the highest speeds, their impacts on accessibility, and accordingly on urban development, tend to be the greatest.¹¹

Heavy rail systems are almost universally electrically propelled, usually from a third rail, and each car has its own motor. Since contact with the high-voltage third rail can be fatal, rapid rail stations usually have high platforms and at-grade tracks are fenced.

Commuter and suburban railways

In terms of operating speed and geographic reach, *commuter rail* or *suburban rail*, stands at the top of the rail transit hierarchy. In Germany and central Europe, where suburb-to-city rail links are widespread, these services go by the name *S-Bahn*. Today, commuter rail services can be found on five continents in over 100 cities in more than 100 countries. Japan dominates the world's commuter rail market. In 1994, Tokyo carried almost six times the number of suburban rail commuters as Bombay, the largest commuter rail market outside Japan. Metropolitan New York's suburban rail is today only 2 per cent of Tokyo's. Nevertheless, metropolitan New York, along with a dozen or so other North American metropolises, is in the midst of a commuter rail renaissance. More commuter rail tracks are currently being planned, designed, and constructed in the United States and Canada than any form of rail transit. In all, twenty-one US and Canadian cities either have commuter rail services or hope to have them

within the next decade. This would raise the total US and Canadian commuter rail trackage to some 8,000 kilometers, more than five times as long as LRT and seven times as long as heavy rail.

Commuter rail services typically link outlying towns and suburban communities to the edge of a region's central business district. They are most common in big metropolitan areas or along highly urbanized corridors and conurbations, such as the Richmond-Boston axis in the northeastern United States. Commuter rail is characterized by heavy equipment (e.g., locomotives that pull passenger coaches), widely spaced stations (e.g., 5 to 10 kilometers apart), and high maximum speeds that compete with cars on suburban freeways (although trains are slow in acceleration and deceleration). Services tend to be of a high quality, with every passenger getting a comfortable seat and ample leg room. Routes are typically 40 to 80 kilometers long and lead to a stub-end downtown terminal. Outlying depots are normally surrounded by surface parking lots that enable suburbanites and exurbanites to access stations conveniently by car. With the exception of the greater New York area (along the MetroNorth corridor to Connecticut), relatively little land-use concentration or redevelopment can be found around US commuter rail stations – after all, the very premise of commuter rail is to serve the low-density lifestyle preferences of well-off suburban professionals who work downtown. Serving commuter trips almost exclusively also means that ridership is highly concentrated in peak hours, more so than any other form of mass transit service.

NOTES

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"Traffic Calming"

from *Sustainability and Cities:
Overcoming Automobile Dependence* (1999)

Peter Newman and Jeffrey Kenworthy

Editors' Introduction



Australian researchers Peter Newman and Jeffrey Kenworthy touched off an international debate in 1989 with their analysis of the relation between urban density and petroleum consumption in their book *Cities and Automobile Dependence* (Brookfield, VT: Gower Technical, 1989). This work showed both the enormous range of urban densities worldwide and the very strong correlation between higher densities and decreased resource use. In their later book *Sustainability and Cities* (Washington, DC: Island Press, 1999), they place transportation squarely at the center of the urban sustainability challenge, and outline various strategies for moving away from automobile dependence. Newman and Kenworthy argue that five key policies are needed to overcome automobile dependence:

- 1 Traffic calming "to slow auto traffic and create more urban humane environments better suited to other transportation modes,"
- 2 Improved transit, bicycling, and walking "to provide genuine options to the car,"
- 3 Improved land use, especially "urban villages" that can "create multinodal centers with mixed, dense land use that reduce the need to travel,"
- 4 Growth management "to prevent sprawl and redirect development into urban villages," and
- 5 Economic incentives, such as "taxing transportation better."

In this selection Newman and Kenworthy discuss approaches to calming traffic, and provide historical background on the global traffic-calming movement that began in Europe in the 1970s. This effort to reclaim automobile-dominated streets for human use is now worldwide and goes far beyond simply improving public safety. It may be seen as part of an effort to humanize public space and reclaim cities for people instead of cars. Other authors have made this point as well, such as Engwicht in his books *Reclaiming our Cities and Towns: Better Living with Less Traffic* (Gabriola Island, BC: New Society Press, 1993) and *Street Reclaiming: Creating Livable Streets and Vibrant Communities* (Gabriola Island, BC: New Society Press, 1999), Donald Appleyard in *Livable Streets* (Berkeley: University of California Press, 1981), and Bernard Rudofsky in his classic *Streets for People: A Primer for Americans* (New York: Doubleday, 1969).

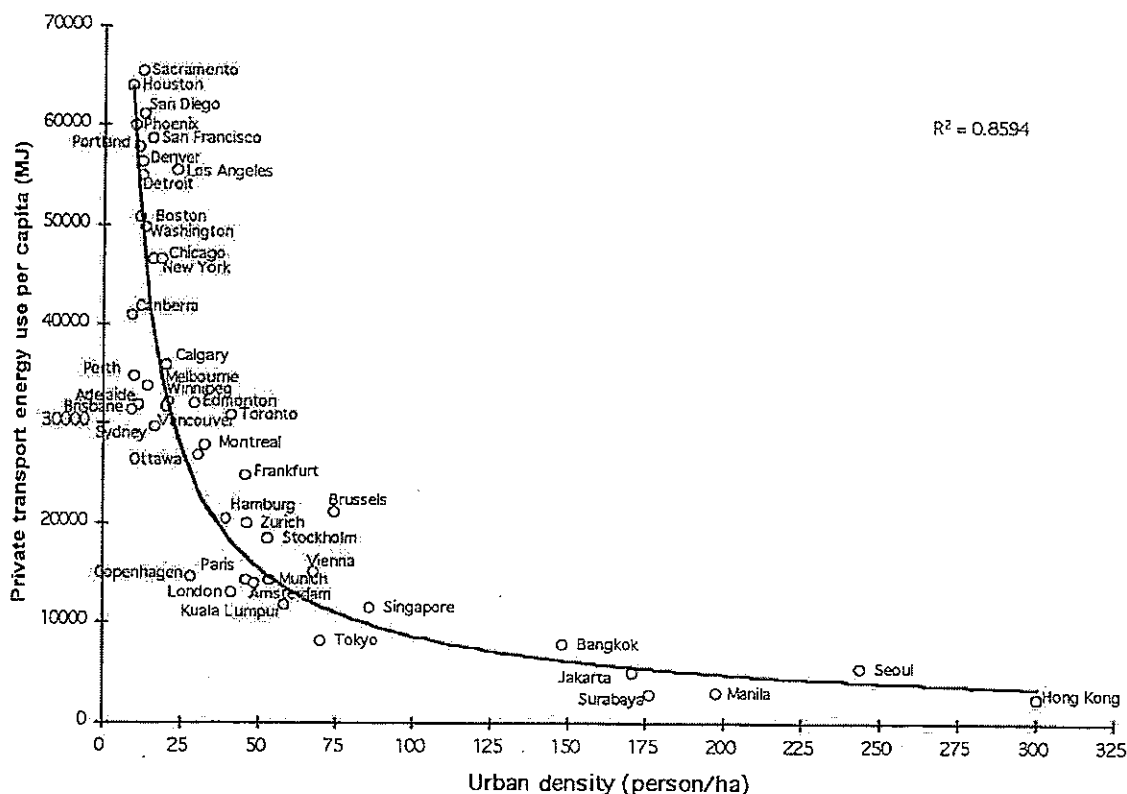


Figure 1. In a previous book, Newman and Kenworthy developed this classic diagram showing the relation between urban density and energy consumption for transportation.

Traffic calming (from the German *Verkehrsberuhigung*) is the process of slowing down traffic so that the street environment is safer and more conducive to pedestrians, cyclists, shoppers, and residential life. Traffic calming is best done by physically altering the street environment through different road textures; changing the geometry of the road through chicanes (also known as S-shaped diverters), neck-downs (also known as chokers), speed plateaus and bumps, and other traffic engineering devices; introducing new street furniture designed to create a more human, safe environment; and planting attractive landscaping.

Together, these changes make drivers slow down by causing them to see less open black-top and to perceive the road as a space that is to be shared with pedestrians, cyclists, and transit vehicles. Through the avenues of trees and street gardens that accompany good traffic-calming schemes, urban wildlife habitats and corridors through cities can be created and soft surfaces can be increased so there is less stormwater pollution.

Traffic calming has the potential not only to lessen the direct negative impacts of road traffic but to foster urban environments that are more human and interactive, more beautiful, and more economically successful due to the greater social vitality possible in a city's public spaces.

It is not known exactly where or when the concept of traffic calming originated, but the German term is believed to have first been used in German federal government reports in the early 1970s. The late John Roberts of Transport and Environment Studies¹ in London was the first to translate the word into English and to bring the concept to the attention of transportation planners in other parts of the world. The idea of traffic calming, however, has its roots in earlier movements to protect city environments from the worst excesses of the automobile. This reached a watershed in the early 1960s with the publication of the major report entitled "Traffic in Towns," by Colin Buchanan.² Although the British approach was to create more calmed city centers and protected

residential precincts, the Buchanan report was used mostly to build large ring roads and bypasses that helped create automobile dependence. The report was used to justify major road proposals in Australian and North American cities as well. However, the European approach is based more on the organic integrity of the urban street and this approach is now gaining currency in the United Kingdom.³

Traffic calming emerged in Europe in the late 1960s from a number of sources: the Dutch *woonerf* or "living yard," created streets that had one shared surface with much planting to slow speeding traffic through inner-city streets and the original pedestrianization schemes in cities such as central Copenhagen.⁴ Traffic calming gained rapid growth and acceptance in Europe in the 1980s through the successful action of many environmental groups trying to curtail the impacts of the automobile on European cities.⁵

Traffic calming's major objectives are to:

- Reduce the severity and number of accidents in urban areas;
- Reduce local air and noise pollution and vehicle fuel consumption;
- Improve the urban street environment for non-car-users;
- Reduce the car's dominance on roads by reclaiming road space for living space;
- Reduce the barrier effects of motor traffic on pedestrian and cycle movement; and
- Enhance local economic activity by creating a better environment for people.

With these broad objectives, traffic calming can also be of benefit to urban regeneration, housing renovation schemes, and city beautification programs (e.g., Freiburg, in southern Germany). These assist more deeply in reducing automobile dependence by bringing urban activity back to areas of the city that are inherently less dependent on the automobile (i.e., denser central and inner areas of cities built more around transit and nonmotorized modes). Traffic calming in Germany was in fact pioneered and promoted much more aggressively by the housing and urban development ministries than by the transportation ministry. This was primarily because of the positive impact traffic calming can have on the character and environmental quality

of neighborhoods, making them much more desirable urban redevelopment and residential areas, while a significant number of transportation planners viewed traffic calming changes with suspicion.⁶

TECHNIQUES OF TRAFFIC CALMING AND THEIR IMPLEMENTATION

Traffic calming was originally restricted mainly to improving residential streets, and this is still a major focus. Traffic calming seeks to alter road layout and design without actually totally rebuilding a street system. It does this through a whole suite of possible techniques such as narrowed entries to streets, plantings of trees with strong vertical elements, variable street surfaces, speed restricting devices, and visual barriers that encourages cautious driving. . . . However, it has been recognized that to be really effective and to not just shift traffic problems from one area to another, traffic calming must be applied more on an area-wide basis,⁷ which means involving arterial or main roads.

There are now many examples of traffic calming on through roads and in other busy areas throughout Europe (e.g., Frankfurt, Hamburg, Nürnberg, Berlin, and Copenhagen). Denmark has a nationwide program of traffic calming on main roads called Environmentally Adapted Through Roads.⁸

The approach to traffic calming has to be somewhat different on main roads because of the volumes of traffic involved, although there is overlap in the basic techniques used. In busier areas where there is a need to better balance the needs of motor vehicles with the needs of pedestrians and cyclists, the main goal is to be able to reclaim road space for other uses by reducing the speed of traffic and its impact. In most cases roads are simply reduced from six to four traffic lanes, or from four to two lanes, through critical areas of a city. . . .

In some cases the reductions in road space are accompanied by significant improvements to transit such as new rail links (e.g., Nürnberg), and in others no major changes are made but incremental improvements are implemented. Road capacity is not necessarily reduced because the loss

of lanes is offset by slower speeds that reduce vehicle headways and enable more vehicles to pass. Similarly, parking supply is not necessarily reduced and in some cases may be increased nominally. Often, parallel parking on two sides of a road is converted to angle parking on alternate sides separated by landscaped strips.

The implementation of traffic calming, however, is not just a technical process but a wide-ranging community process whereby local residents can have a strong input into identifying the problems and helping to find the solutions. It has been repeatedly shown that consultation with and involvement of the community are essential to the widespread acceptance of traffic-calming schemes. In fact, an important aspect of traffic calming is the way it has been able to provide a focal point for mobilizing and galvanizing many communities around the world into developing and fighting for a vision of a more sustainable and socially acceptable solution to the problem of traffic in urban environments.⁹

EFFECTS OF TRAFFIC-CALMING SCHEMES

Many of the major traffic-calming schemes in Europe have been formally sponsored by national and local governments as demonstration projects, and one of the aims has been to test the effects of the traffic-calming schemes on key environmental indicators and safety factors. Much of the available evidence about the effects of traffic-calming schemes comes from before-and-after studies of these projects.

The following is a brief summary of the general effects of traffic-calming schemes, along with some specific examples:

Reduced accidents. Accidents, particularly the severity of accidents, are generally significantly reduced with traffic calming because speed is the most critical factor in road accidents – particularly regarding the risk of serious injury and the danger to pedestrians and cyclists. In Berlin, for example, an area-wide scheme resulted in the reductions shown in Table 1.

Most other schemes report similar kinds of data, such as in Heidelberg, which experienced average accident reductions of 31 per cent and a

Type of traffic	Accident measure	Percent reduction
All traffic	Fatal accidents	-57
	Serious accidents	-45
	Slight accidents	-40
	Accident costs	-16
Nonmotorized	Pedestrians	-43
	Cyclists	-16
	Children	-66

Table 1 Accident reductions in Berlin Moabit (neighborhood) using comparable before and after periods

Source: Reported in Pharoah, T. and Russell, J. 1989. *Traffic Calming: Policy Evaluation in Three European Countries*. Occasional Paper 2/89, Department of Planning, Housing and Development. London: South Bank Polytechnic.

44 per cent reduction for casualties after thirty-kilometer-per-hour [eighteen-mile-per-hour] residential speed limits were introduced along with selected physical traffic-calming measures.¹⁰ Area-wide schemes in The Netherlands have reduced accidents involving injury by 50 per cent in residential areas and 20 per cent overall (measured per million vehicle kilometers) and no increase in accidents has occurred in surrounding areas.¹¹

The Center for Livable Communities, in their *Livable Places Update* for March 1998, summarized some of the best US examples of traffic calming, and in relation to accidents, found the following:

- The City of Seattle, where traffic-calming projects have been carried out for 20 years, surveyed the results of 119 completed projects and found an overwhelming 94 per cent reduction in accidents.
- In Portland, Oregon, 70 traffic circles and 300 speed bumps have been introduced and the number of reported accidents decreased by 50 per cent.
- A 1997 study of US street typology and accidents by Swift and Associates showed that as street width increases, accidents per mile per year increase exponentially. The safest residential street (curb to curb) turned out to be 24 feet (7.2 meters). Present US street regulations require

36 feet, primarily for access by fire vehicles, though the study found that fire vehicles can access 24-foot-wide roads when required. New Urbanism design guidelines are for 24-foot roads.

Noise reduced. Traffic calming generally results in a reduction in vehicle noise. Pharoah and Russell report that noise changes result from five factors: changes in traffic volume and composition, changes in carriageway layout, changes in carriageway surface, changes in vehicle speed, and changes in driving style.¹²

Air pollution benefits. Research in central Europe shows that in built-up areas, the higher the vehicle speed the more will be the proportion of acceleration, deceleration, and braking, and this increases air pollution. By contrast, traffic-calming schemes in some German residential areas have shown that idle times are reduced by 15 per cent, gear changing by 12 per cent, brake use by 14 per cent, and fuel use by 12 per cent.¹³

Evidence of the air pollution benefits of a slower, calmer style of driving comes from detailed work in Buxtehude, a German demonstration project (population 33,000). Table 2 shows the changes in the different types of emissions with a reduction of speed from 50 kilometers per hour (30 miles per hour) to 30 kilometers per hour (18 miles per hour) under two types of driving. In both aggressive and calm driving, emissions are reduced at the 30 kilometers per hour level, though the calm driving has a generally greater reduction and fuel use is lower.

	Driving style	
	Second gear, aggressive (%)	Third gear, calm (%)
Carbon monoxide	-17	-13
Hydrocarbons	-10	-22
Nitrogen oxides	-32	-48
Fuel consumption	+7	-7

Table 2 Changes in vehicle emissions and fuel use from 50 km/h to 30 km/h

Source: Reported in Pharoah, T. and Russell, J. 1989, op. cit.

It is also worth noting that even in instances when individual vehicles may experience an increase in fuel use and emissions (e.g., drivers do indulge in more acceleration, braking, and greater use of second gear), this may not result in an overall increase in local pollution and fuel use if the traffic-calming scheme has also resulted in lower traffic volumes.

Enhanced pedestrian and street activity. Traffic calming seeks to make the public environment safer and more attractive, so it is to be expected that traffic calming will result in a greater level of pedestrian and cycling activity in the area affected. In general, it can be expected that the results will be more noticeable in busier areas with a mix of land uses and the potential for people to make good use of reclaimed areas, such as for outdoor cafes and markets, children's facilities, etc.

Some formal measurements of the benefits are available from a summary of European experience by Pharoah and Russell (1989), such as in Berlin's federal demonstration project, where nonmotorized traffic on a wide range of streets in the scheme increased by between 27 per cent and 114 per cent; in Vinderup, a village in Denmark, where the main through route was traffic-calmed and outdoor activities increased by up to 47 per cent; and in Copenhagen, where traffic calming has led to immediate increases of pedestrian activity of between 20 per cent to 40 per cent, and in the long term, where central area activity is now 80 per cent pedestrian and 14 per cent by bike.¹⁴ Where traffic calming reduces road capacity there is an overall decrease in traffic¹⁵ and therefore better conditions are created for pedestrians.

Traffic calming also tends to increase the area used by pedestrians and cyclists and the extent to which streets are crossed by these users, since the severance effects of traffic are reduced. Pedestrians and cyclists tend not to confine themselves purely to walkways, but rather they extend their territory to the roadway in some instances.

Reduced crime rates. Appleyard (1981) showed that visiting among neighbors decreases when traffic increases,¹⁶ and when neighboring ceases and people stop watching out for one another, then criminal activity can occur. The *Livable Places Update* (March 1998) overview on traffic calming quotes a Harvard University study that showed violent crimes in communities where residents willingly

worked together were as much as 40 per cent lower than in neighborhoods where such relationships were not as strong. Race and income were not factors in people's willingness to take part in such community activity. An example of a place where crime rates diminished after traffic calming is Weinland Park in Columbus, Ohio.

Positive economic implications. As pointed out in the objectives of traffic calming, economic revitalization of an area is an explicit aim in some schemes. A study by TEST (1989) attempted to confirm the hypothesis that "A good physical environment is a good economic environment" and examined ten European cities in detail. Roberts sums up the work by saying, "the message is simple: there is a strong likelihood that traffic restraint in all its forms, and environmental improvement, and a healthy economy, are causally related."¹⁷

The basis of this finding would appear to involve at least the following factors:

- ☐ People like to come to humanly attractive, green cities.
- ☐ Businesses like to locate in areas with a high quality urban environment.
- ☐ Car access is not banned, but it is not facilitated to the point of dominating everything else.
- ☐ Other modes are generally facilitated.

Hass-Klau (1993) shows conclusively that pedestrianization and traffic calming both have positive effects on the economic performance of an area; the more aggressive is the traffic calming, the more pronounced is the positive economic effect.¹⁸

In the United States, a West Palm Beach, Florida, neighborhood was economically depressed and bisected by fast-moving traffic. A traffic-calming scheme slowed the traffic through road narrowing and construction of speed bumps, traffic circles, and pedestrian islands. Then the city raised intersections, made sidewalks level with the street, and added a fountain, benches, and an amphitheater for "block parties." The development spurred new private investment and the cost of commercial space rapidly moved from five dollars per square foot to twenty-five dollars per square foot.¹⁹ Similar case studies are given in the UK Friends of the Earth publication.²⁰

TRAFFIC CALMING: A BROADER APPROACH

Traffic calming can be viewed as a broader transportation planning philosophy and not merely as a series of physical changes to roads.²¹ Traffic calming in this broader sense is aimed at reducing total dependence on the automobile and promoting a more self-sufficient community with a transportation system more oriented to pedestrian, cycle, and transit use.

These broader objectives can be summarized as follows:

- ☐ A reduction of average motor vehicle speeds to discourage long-distance road travel in urban areas and promotion of a more compact urban form; traffic calming of main roads is included in this approach.
- ☐ Specific land use policies that better integrate transit and land development; the policies are directed at reducing the number, length, and need for motor vehicle trips.
- ☐ Strong promotion of walking, cycling, and transit.
- ☐ Restrictive measures against private traffic, including parking restrictions, limited major road building, and the direction of funds into transit and nonmotorized modes, as well as taxation policies on fuels and cars, including policies on company cars and road pricing.
- ☐ A shift in transportation planning philosophy from a traffic-generation approach of seeking to predict future traffic levels and the roads and parking needed to cope with them, to a traffic-dissolving approach of setting limits on motor vehicle growth and ensuring that transportation/land use policies and practices are aimed at minimizing the need for more motor vehicle facilities.

A good example of a broader traffic-calming policy in action is the Dutch national policy from 1982 that openly promotes transit, walking, and cycling. It states that:

Henceforth other functions will be given priority over motor traffic [and] the car's dominance should be diminished by deliberately increasing travel times, by creating a less dense network of main roads, and by reducing speeds.²²

NOTES

- 1 See Transport and Environment Studies (TEST). 1989. *Quality Streets – How Traditional Urban Centers Benefit from Traffic Calming*. London: TEST.
- 2 Minister of Transport. 1963. *Traffic in Towns*. London: HMSO.
- 3 Standing Advisory Committee on Trunk Road Assessment (SACTRA). 1994. *Trunk Roads and the Generation of Traffic*. London: Department of Transport, United Kingdom; Department of Environment. 1994. *Planning Policy Guidance 13: Transport*. Whitehall, London: Department of Environment and Department of Transport.
- 4 Gehl, J. and Gemzøe, L. 1996. *Public Spaces, Public Life*. City of Copenhagen.
- 5 More detail on the evolution of traffic calming may be found in Hass-Klau, C. 1990. *The Theory and Practice of Traffic Calming: Can Britain Learn from the German Experience?* Discussion Paper 10, Rees Jeffreys Road Fund. Oxford: Transportation Studies Unit, Oxford University; Tolley, R. 1990. *Calming Traffic in Residential Areas*. Wales, UK: Brefi Press; Newman, P. and Kenworthy, J. 1991. *Towards a More Sustainable Canberra: An Assessment of Canberra's Transport, Energy and Land Use*. Institute for Science and Technology Policy, Murdoch University.
- 6 Hass-Klau. *The Theory and Practice of Traffic Calming*.
- 7 Hass-Klau, C. 1990. *The Pedestrian and City Traffic*. London: Belhaven Press.
- 8 Danish Road Data Laboratory. 1987. *Consequence Evaluation of Environmentally Adapted Through Road in Vinderup*. Report 52, Danish Road Data Laboratory, Danish Roads Directorate, Herlev, Copenhagen; *Consequence Evaluation of Environmentally Adapted Through Road in Skærbæk*. Report 63, Danish Road Data Laboratory, Danish Roads Directorate, Herlev, Copenhagen.
- 9 E.g. Tolley. 1990. *Calming Traffic in Residential Areas*.
- 10 Hass-Klau, C. 1990. *An Illustrated Guide to Traffic Calming: The Future Way of Managing Traffic*. London: Friends of the Earth.
- 11 Hass-Klau, C. (ed.) 1986. New Ways of Managing Traffic. *Built Environment*, 12 (1 and 2).
- 12 Pharoah, T. and Russell, J. 1989. *Traffic Calming: Policy Evaluation in Three European Countries*. Occasional Paper 2/89, Department of Planning, Housing and Development. London: South Bank Polytechnic.
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- 15 Goodwin, P.B. 1997. Solving Congestion. Inaugural Lecture for the Professorship of Transport Policy, University College, London, 23 October.
- 16 Appleyard, D. 1981. *Livable Streets*. Berkeley: University of California Press.
- 17 Roberts, J. 1988. Where's Downtown? 'It Went Three Years Ago.' *Town and Country Planning*, May, pp. 139–141.
- 18 Hass-Klau, C. 1993. Impact of Pedestrianization and Traffic Calming on Retailing: A Review of the Evidence from Germany and the UK. *Transportation Policy*, 1 (1), pp. 21–31.
- 19 Center for Livable Communities. 1998. Benefits of Traffic Calming Realized Across the Country. *Livable Places Update*. March.
- 20 Friends of the Earth. 1997. *Less Traffic, More Jobs: Direct Employment Impacts of Developing a Sustainable Transport System in the United Kingdom*. London: Friends of the Earth.
- 21 Hass-Klau. 1990. *The Theory and Practice of Traffic Calming*.
- 22 Ministry of Transport and Public Works. 1982. *From Local Traffic to Pleasurable Living*. The Hague: Ministry of Transport and Public Works, The Netherlands.



"Bicycling Renaissance in North America?"

from *Transportation Research A* (1999)

John Pucher, Charles Komanoff, and Paul Shimek

Editors' Introduction



Despite attempts to develop new devices such as the Segway scooter as an alternative to the automobile, the tried-and-true solution for short-distance personal mobility in many parts of the world has been the bicycle. Simple, cheap, pollution-free, and easy to maintain, the bike has been used widely in nations ranging from China to Cuba. At rush hour waves of cyclists pass down the streets of European cities such as Copenhagen or Amsterdam, as well as those of countless cities in the developing world. Many nations have also sought to promote cycling as a convenient way for public transit patrons to reach transit stations.

While both bicycling and walking seem ideal transportation modes for a sustainable city, a key question is how these can be encouraged within low-density, automobile-dependent communities such as in North America and Australia. While there are signs that cycling is on the increase, much bicycle use in these places is for recreation. What would it take for the bicycle to become a more all-round transportation alternative? In this selection leading transportation researchers John Pucher, Charles Komanoff, and Paul Shimek explore this question. Pucher is a professor in the Department of Urban Planning at Rutgers University in New Jersey, where he has written widely on transportation topics. Komanoff is president of Komanoff Energy Associates in New York City, and a leading consultant on issues of energy use, transportation pricing, and alternative transportation modes. Shimek is a researcher at the Volpe National Transportation Systems Center in Cambridge, Massachusetts.

Other useful materials on bicycle use include an article by Pucher and Lewis Dijkstra, "Making Walking and Cycling Safer: Lessons from Europe," published in *Transportation Quarterly*, 54(3), 2000; *Pedestrian and Bicycle Planning: A Guide to Best Practices*, by Todd Litman *et al.*, available from the Victoria Transportation Policy Institute at www.vtpi.org; and material from the Association of Pedestrian and Bicycle Professionals at www.apbp.org.



Several northern European countries have been enjoying a bicycling boom. Over the past two decades, cycling has increased significantly in Denmark, Germany, Switzerland, and The Netherlands.¹ The number of bicycle trips has grown substantially in these countries, and in many cities cycling's share of travel has risen as well. In

Germany, for example, bicycling's modal share for urban trips rose by half between 1972 and 1995, from 8 per cent to 12 per cent.² Currently, the bicycle's share of local trips is 30 per cent in The Netherlands, 20 per cent in Denmark, 12 per cent in Germany, and 10 per cent in Switzerland – over ten times higher than in the United States.³

All these European countries have very high standards of living, and all have experienced rising incomes, growing auto ownership, and rapid suburbanization. Yet bicycling is thriving in this environment, primarily due to long-term commitments to enhance the safety, speed, and convenience of bicycling while making driving more difficult and expensive. These policies were adopted by democratic political systems, partly to mitigate the social and environmental harm of excessive auto use in cities, but also to accommodate rising demands for mobility within the physical constraints of congested urban roads, high-density cities, and limited land supply for parking.

Many groups have been advocating increased bicycling in the United States, not just for recreation but also for commuting and other utilitarian purposes. The League of American Bicyclists, the Bicycle Federation of America, and bicycling groups in virtually every state and many cities coordinate bicycling events, offer training courses, and lobby for cycling facilities and cycling-friendly roads and traffic policies. Many environmental organizations, community activists, and urban planners support cycling because it is an energy-efficient and non-polluting transport mode, and some transport planners view space-efficient cycling as a way to reduce roadway congestion. Aside from the cost of travel time, cycling is also cheaper than any mode except walking and thus affordable to even the poor. Moreover, the public costs of bicycling are modest, especially compared to motorized transport. Finally, fitness experts and health professionals advocate cycling for its cardiovascular benefits.

In recognition of the benefits of bicycling, and in response to strong public pressure, public policies in the United States have become more supportive of bicycling, especially since passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. The successor to ISTEA, the 1998 Transportation Equity Act for the Twenty-first Century (TEA21), continues this trend. ... [T]he decade of the 1990s has witnessed a dramatic increase in funding of bicycling facilities in the US, with the focus so far on investments in new bike paths. Most states and many cities now have programs to facilitate bicycling, including bicycle coordinators in state departments of transportation. Traffic policies and roadway design in some

locales are gradually becoming more conducive to bicycling. Unfortunately, little has been done to educate motorists about cyclists' rights and to enforce traffic laws that allow cycling on most streets and roadways. ...

[...]

Do the growing interest in bicycling and the accompanying policy shifts suggest that America may be poised for a bicycling renaissance? Some bicycling advocates and trade publications already claim a massive boom in bicycling in the United States in recent years.⁴ While cycling has certainly increased, sightings of a boom are open to question. This article uses a variety of sources to assess the actual extent of growth in cycling in the United States over the past two decades. ... On the basis of our seven North American cities, and using information from European experience, we conclude by assessing the effectiveness of alternative policies to promote cycling. ...

[...]

FACTORS AFFECTING CYCLING IN NORTH AMERICA

Cycling has increased in North America over the past two decades, both in the aggregate and for seven case study cities. While the increases are encouraging, the share of total trips by bike in the US still stands at only about 1 per cent, far lower than in most European countries⁵. ...

Although climate and topography affect cycling levels, the case studies show that they do not explain differences in cycling rates among North American cities. A more important deterrent is the low-density sprawl of most American metropolitan areas, which increases average travel distances and renders utilitarian cycling less feasible. This factor alone may explain the higher cycling levels in Canadian cities, which are more than twice as dense as American cities.⁶ European cities are denser still, leading to average trip lengths only about half those in the US.⁷

Nevertheless, even in the United States, a considerable percentage of urban trips are within cycling distance. According to the NPTS, 28 per cent of trips by all modes are one mile or shorter, and another 20 per cent are one to three miles. Of course, some of those short trips are links of

longer trip chains that are less readily bikeable. Nevertheless, the high percentage of short trips suggests great potential for increased bicycling, even in the low-density, sprawled cities of the US.

Why, then, does bicycling in the United States remain at low levels? Here we summarize eight key factors.

Public attitude and cultural differences

Is bicycling for transportation considered a normal thing to do? In The Netherlands and Denmark, it is usual for young and old, rich and poor, and students and executives alike to bicycle for many different purposes. In the United States, most cycling is for recreation, and most cycle commuters are men. Even though a majority of Americans own a bicycle, cycling is considered a "fringe mode" in the US,⁸ befitting its 0.9 per cent share of total trips. Utilitarian cycling is even less mainstream, with the bicycle used for only 0.3 per cent of all work trips in 1995, according to the NPTS.

Culture, custom, and habit are important. While the other factors listed below help explain which forms of travel behavior become widespread and thus considered "normal," countries with unbroken traditions of utilitarian cycling have an easier time maintaining that tradition. Where cycling is viewed as normal, people consider doing it when it is convenient, and they have access to the necessary equipment and knowledge. Similarly, motorists exhibit more respect toward cyclists, partly because they are more likely to cycle themselves or know others who do. In general, where there are few bicyclists, cycling is considered abnormal, and this climate tends to be self-perpetuating.

Public image

There is no single image of bicycling in America, but a multiplicity of perceptions dependent upon the type of cycling and the context in which it is viewed. Recreational cycling has a youthful, vigorous image since it is associated with sport and fitness; some car ads even feature recreational cyclists. Bicycling as a whole also has a positive environmental image, thanks to zero air pollution,

negligible noise, and minimal energy use. In cities, where the vast majority of utilitarian cycling takes place, cyclists suffer from a renegade image associated with disobedience of traffic laws, and a pervasive sense of cyclists as an alien presence on roads intended for cars. Indeed, the various images of cycling are so heavily determined in relation to automobiles that utilitarian cyclists are variously seen as too poor to own a car, "anti-auto," eccentric, or deviant. The perceptions of cycling as lying outside the mainstream of American life discourage bicycle use.

City size and density

Small, compact cities are more amenable to cycling since more destinations are accessible within a short bike ride, motor traffic volumes are lower, and there are less likely to be obstacles such as expressways and bridges. Indeed, to our knowledge, no very large city (1 million or larger) in either Europe or North America has bike use exceeding 10 per cent of trips. Europe has many more small, dense cities where biking is convenient for reaching many destinations.

Cost of car use and public transport

The cost, speed, and convenience of alternative modes have a crucial impact on modal choice. In the US, the low user-cost of autos is crucial in discouraging virtually all other modes, even walking. Low gasoline taxes, few road tolls, and ubiquitous free parking make auto use almost irresistible in the United States. At negligible marginal user costs, car use becomes a habit even for short trips that could be walked or cycled.⁹ Not only are road tolls, taxes and fees far higher in Europe, but the extensive availability of transit makes car ownership less essential, thus reducing the number of car owners and increasing the tendency to use bicycles for many utilitarian trips.

Income

Rising incomes make car ownership and use more affordable. Every econometric analysis of the

relationship between income and auto ownership finds a very high positive correlation. This helps explain why university students are more likely to bicycle, and suggests that the bike share of travel should decrease over time as countries get richer and an ever-larger share of the population can afford cars. This generalization does not always hold, however. Although Denmark, The Netherlands, and Germany are among the wealthiest countries in the world, they have very high bike modal shares.

Climate

Cycling levels are obviously affected by climate. Three case study cities with relatively high levels of cycling (Davis, San Francisco, and Seattle) enjoy mild winters and, in the case of the first two, little rain. The extreme heat and humidity of summers in the southern United States clearly discourage cycling there. Yet the effect of climate on cycling may be exaggerated. In spite of mostly cloudy days and frequent rain and drizzle, northern Europe has the highest cycling levels, far higher than in southern Europe, where it is drier, sunnier, and warmer.

Danger

The possibility of accidental injury and death is a major obstacle to bicycling. Making cycling as safe or safer than driving will require behavioral changes by both drivers and bike riders, as well as development of more cycle-appropriate infrastructure. While several European countries have national cycle training programs and more strictly enforce traffic rules for both drivers and cyclists, efforts at such behavior modification have been far less extensive and less successful in the US. Moreover, in the United States the elevated risks of cycling appear to be magnified by cultural attitudes that attribute cycling accidents to the supposedly intrinsic perils of bicycles. In contrast, motorist casualties are not ordinarily associated with the idea that driving is dangerous.¹⁰ From there it is a short step to blaming cyclists for their own peril, an attitude that permeates the reactions of everyone from police and courts to the cyclist's own

family and friends and contributes to cyclists' marginal status. Thus, measures to reduce the statistical frequency of cycling accidents may need to be coupled with efforts to change public understanding of the nature of road dangers — a difficult task at best.

Cycling infrastructure

Unquestionably, separate bike lanes and paths for cyclists, together with better parking facilities, make cycling more attractive to noncyclists. However, we are not aware of any rigorous statistical studies of their actual impact on increasing cycling levels; to some extent, such facilities may be a response to increased cycling instead of its cause. Nevertheless, every European city with high cycling levels has an extensive route system, including separate bike paths and lanes as well as general street use in traffic-calmed neighborhoods.

STEPS TO INCREASE CYCLING IN NORTH AMERICA

Following are seven proposals for making cycling more widespread in the US and Canada.

Increase cost of auto use

Probably the most effective way to increase bicycling in North America would be to discourage auto use and increase its marginal cost, particularly for short auto trips that are both underpriced and most amenable to cycling. A sizeable increase in the price or inconvenience of driving would encourage people to seek other ways to travel and begin loosening the automobile's domination of daily transportation. Unfortunately, this approach is politically difficult. Indeed, the new federal transportation legislation (TEA21) fixes the federal gasoline tax at the same low level (approximately two cents per liter) for the next six years, and recently taxes on auto ownership have been rolled back in several states. A more promising approach may be restructuring road taxes and auto insurance to shift lump-sum charges into marginal use fees, thus providing positive incentives to shorten trips

and make greater use of non-auto modes.¹¹ Blocking highway expansion also increases the time cost to drive and can make cycling more attractive, although it could also work against cycling by fomenting "rat-running" (driver use of local streets) and "road rage."

Clarify cyclists' legal rights

To a great extent, cyclists in the United States and Canada operate outside the prevailing system of traffic governance. As we have noted, many motorists and even police are not cognizant of cyclists' right to use ordinary roads, and there is scant appreciation of the vulnerability cyclists feel when autos impinge too closely. In contrast, many northwestern European cities actively promote cycling through conferences, fairs, and school programs, and their traffic rules, policing, licensing, and judicial systems uphold cyclists' rights far more than do their North American counterparts. However difficult it may be, establishing motorists' accountability for their actions toward cyclists is crucial to improving bicycling safety and encouraging cycling. A key first step, noted in the Toronto case study, would be to establish as a principle of law that cyclists have precedence over motor vehicles where both are vying for the same road space and neither clearly has right of way over the other. With their preferential right of way established in law, cyclists might improve their adherence to traffic laws, leading in turn to greater consideration from motorists in a reinforcing process of mutual respect.

Expand bicycle facilities

As discussed earlier, separate facilities (bike paths and lanes) are not a panacea for making cycling easier and safer. Nevertheless, rail trails and mixed-use greenway paths have increased recreational bicycling, and strategically located cut-through paths (as in Davis) can reduce trip times and thus encourage utilitarian cycling as well. The most successful bicycling programs examined in this article – in Davis, Madison and Seattle – include separate facilities in their overall strategy. Moreover, in every European country with at least 10 per

cent bike modal split, separate cycling facilities (and traffic-calmed neighborhood streets) are integral parts of the bike route system. Separate paths and lanes are especially important for those unable or unwilling to do battle with cars for space on streets. Training courses may help, but they do not eliminate the inherent danger of cycling on the same right of way with motor vehicles, particularly for those whose mental or physical conditions limit their capacity to safely negotiate heavy traffic. The slowed reflexes, frailty, and deteriorating hearing and eyesight of many elderly make them especially vulnerable, while limited experience, incomplete judgment, and unpredictable movements put children at special risk on streets. And regardless of age, many people prefer to avoid the anxiety and tension of cycling in mixed traffic, aside from safety hazards. Bicycling should not be reserved for those who are trained, fit, and daring enough to navigate busy traffic on city streets.

Make all roads bikeable

More than other countries, the United States must rely heavily on the general road network for bicycling. Some cities have bike lanes and paths that link up to some extent, but none has a complete route network approaching the dense network of bike paths and lanes in virtually every Dutch, Danish and German city and throughout the countryside, with official route designations, signage and maps. Even Davis and Seattle, with their impressive cycleways, must also rely on the general road system. Thus, a fundamental strategy to make America bikeable must be to improve roads through wider curbside lanes and shoulders, drain grate replacement, pothole patching, clear lane striping, and bike-activated traffic signals, while punishing motorist behavior that infringes upon cyclists' legal right of way. Seattle's efforts to improve the road infrastructure are a good model, but no US jurisdiction has taken real steps to inculcate motorist responsibility for cyclist safety.

Hold special promotions

Bike-to-work weeks and employer-based promotions appear to have been helpful in inducing North

Americans to try – and then continue – cycling for transportation. Similarly, large-scale rides ranging from recreational and charity events to San Francisco's monthly Critical Mass rides help build cyclist confidence and provide mutual support and enthusiasm for cycling. In some cases such rides have also focused public attention on the needs of cyclists and helped force a shift toward more cycling-friendly public policies.

Link cycling to wellness

Numerous studies have documented the health benefits of regular exercise, and physical inactivity has come to be seen as a major cause of premature death in industrial societies, second only to tobacco. Cycling, potentially an ideal, low-cost way of getting that activity, has been linked in the public mind to risktaking and danger, in part by health-based helmet promotions that implicitly link cycling to danger. The British Medical Association's finding that cardiovascular-related gains to longevity from cycling far outweigh collision risks, though widely reported in Europe, is little known in North America.¹² New programs from the California Department of Health Services and the US Centers for Disease Control and Prevention seek to integrate routine physical activity into people's travel, work, leisure, and family life by making physical environments more amenable to walking and bicycling.¹³ Holistic and pro-active efforts by the health community could boost cycling by casting it as a prudent, healthful choice.

Broaden and intensify political action

As emphasized by transportation researcher Martin Wachs,¹⁴ political action is essential to bring about changes in public policy to encourage more and safer cycling. Bicyclists in many parts of the United States are already well-organized, and have learned to wield political clout to obtain funding for cycling facilities. Cyclists have won pro-bicycling provisions in ISTEA and TEA21 that portend major expansions and improvements to systems of bike paths, lanes, and parking. TEA21 also encourages better roadway design, which provides

an important basis for making more roads bikeable. Nevertheless, it remains to be seen how effectively cycling groups can pressure state highway departments to carry out the federal mandates. Similarly, cycling groups will have to continue to exert pressure at the local level to maintain and improve existing elements of the cycling infrastructure, such as bridge access, against the threat of prohibitions or banishment to substandard facilities. Cyclists will also need to open up another front: inducing police and courts to enforce the rights of bicyclists to use city roads and to curb driving privileges of motorists who violate those rights.

PROSPECTS FOR BICYCLING IN NORTH AMERICA


With the right set of public policies, bicycling in the United States could increase dramatically. As noted by both Wachs and Gordon and Richardson, to date there has not been sufficient political support to pass and implement those policies. So far, only the easiest no-conflict measures have been implemented; most new bike paths and lanes in the United States do not directly compete with auto use. By contrast, many European cities have implemented policies that sharply restrict auto use in favor of walking and bicycling, especially in city centers.¹⁵ German, Dutch, and Danish cities give cyclists priority on certain streets and intersections and routinely employ "advanced" green lights and traffic-calmed streets. Some one-way streets have been made two-way for bicyclists, and cyclists are exempted from many turn restrictions for cars. Some European cities have dedicated car parking space to bike lanes or bike parking, not just to enable cycling but to discourage auto use. Enacting such measures has taken concerted political pressure, even in cities where 20 per cent of the populace cycles regularly. Such auto-restrictive initiatives do not yet appear politically feasible in America. Too many Americans drive cars (and would feel hurt by such measures), and too few Americans presently bicycle (and feel they would benefit enough to fight for such measures).

It is possible to imagine a *deus ex machina* giving a strong boost to cycling in America – perhaps an oil shock, or a cultural or style change toward bikes and away from cars, or ascendancy of a

charismatic politician closely identified with cycling. But the more likely scenario is slow, painstaking progress: modest extensions and improvements in separate bicycle facilities, even more modest improvements in roadway design, and isolated instances of effective enforcement of cyclist rights to use public roads. Those measures may produce significant growth in bicycling in those cities that implement them. But overall, they will not produce a bicycling boom, unless the visible success of cycling enhancements in one or two major cities attracts imitators elsewhere.

NOTES

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"People-of-Color Environmentalism"

from *Dumping in Dixie: Race, Class,
and Environmental Quality* (1990)

Robert Bullard

Editors' Introduction



Sustainability goals are often presented in terms of the "three Es" – environment, economy, and equity – which in a sustainable society would all be enhanced rather than undermined over the long term. Of these, equity has been by far the least represented within public policy debates. There are relatively few well-organized groups advocating on behalf of low-income or otherwise disadvantaged communities. Even the environmental movement, with its relatively progressive middle-class constituency, developed with little consideration of the equity implications of its issues.

The link between social justice and environmental issues in the USA was developed beginning in the 1980s in large part by working-class communities fighting against the location of garbage incinerators, land fills, and toxic chemical hazards near their neighborhoods. African-American and Latino activists also criticized mainstream environmental groups for their lack of diversity, and demanded changes in federal regulation to produce more equitable public participation within environmental decision-making. At the same time, Third World activists were calling attention to the inequitable impacts of development policies internationally – a separate but parallel set of equity debates. The environmental injustices suffered by disenfranchised communities in North America, in other words, came to be seen by many activists as similar to the condition of less well-off groups worldwide.

Atlanta sociology professor Robert D. Bullard has been at the forefront of chronicling and defining the environmental justice movement in the USA. Here he discusses the roots of the movement, links with gender issues, and prospects for future organizing. Other leading writings on the subject of environmental justice include *Sprawl City: Race, Politics, and Planning in Atlanta*, edited by Bullard, Glenn S. Johnson, and Angel O. Torres (Washington, DC: Island Press, 2000), *Environmental Injustices, Political Struggles: Race, Class, and the Environment*, edited by David E. Camacho (Durham, NC: Duke University Press, 1993), and *Just Sustainabilities: Development in an Unequal World*, edited by Julian Agyeman, Robert D. Bullard, and Bob Evans (Cambridge, MA: MIT Press, 2003).



It is time for people to stop asking the question "Do minorities care about the environment?" The evidence is clear and irrefutable that white middleclass communities do not have a monopoly on environ-

mental concern, nor are they the only groups moved to action when confronted with the threat of pollution. Although a "concern-and-action gap" may still exist between people of color and whites,

communities of color are no longer being bullied into submission by industrial polluters and government regulators.¹

Clearly, a "new" form of environmentalism has taken root in America and in communities of color. Since the late 1970s, a new grassroots social movement has emerged around the toxics threat. Citizens mobilized around the anti-waste theme. These social activists acquired new skills in areas where they had little or no prior experience. They soon became resident "experts" on toxics issues. . . . However, they did not limit their attacks to well-publicized toxic-contamination issues but sought remedial actions on problems like housing, transportation, air quality, and even economic development — issues the traditional environmental agenda had largely ignored.

Environmental justice embraces the principle that all people and communities are entitled to equal protection of environmental, health, employment, housing, transportation, and civil rights laws. Activists even convinced the EPA to develop a definition of environmental justice. The EPA defines environmental justice as:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including racial, ethnic, or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.²

A major paradigm shift occurred in the 1990s. This shift created a new framework and a new leadership. Women led much of this grassroots leadership. The impetus behind this change included grassroots activism, redefinition of environmentalism as a "right," research documenting disparities, national conferences and symposia, emphasis on pollution and disease prevention, government initiatives, interpretation of existing laws and mandates, and grassroots alliances and coalitions.

Environmentalism has been too narrowly defined. Concern has been incorrectly equated with check

writing, dues paying, and membership in environmental organizations. These biases have no doubt contributed to the misunderstanding of the grassroots environmental justice movement in people-of-color communities. People-of-color activists in this new movement focused their attention on the notion of deprivation. For example, when people of color compare their environmental quality with that of the larger society, a sense of deprivation and unequal treatment, unequal protection, and unequal enforcement emerges. Once again, institutional racism and discriminatory land-use policies and practices of government — at all levels — influence the creation and perpetuation of racially separate and unequal residential areas for people of color and whites. Too often the disparities result in groups fighting another form of institutional discrimination.³

All communities are not created equal. Institutional barriers have locked millions of people of color in polluted neighborhoods and hazardous, low-paying jobs, making it difficult for them to "vote with their feet" and escape these health-threatening environments. Whether in the ghetto or barrio, on the reservation, or in rural "poverty pockets," environmental injustice is making some people sick. Government has been slow to take these concerns as legitimate environmental and health problems. Mainstream environmentalists have also been slow in recognizing these grassroots activists as "real" environmentalists.⁴

The environmental justice movement is an extension of the social justice movement. Environmental justice advocates should not have to apologize for this historical fact. Environmentalists may be concerned about clean air but may have opposing views on public transportation, highway construction, industrial-facility siting, or the construction of low-income housing in white, middle-class suburban neighborhoods. On the other hand, environmental justice advocates also want clean air. People of color have come to understand that environmentalists are no more enlightened than nonenvironmentalists when it comes to issues of justice and social equity. But then, why should they be more enlightened? After all, we are all products of socialization and reflect the various biases and prejudices of this process. It is not surprising that mainstream environmental organizations have not been active on issues that disproportionately

impact people of color, as in the case of toxics, workplace hazards, rural and urban housing needs, and the myriad of problems resulting from discriminatory zoning and strains in the urban, industrial complex. Yet people of color are the ones accused of being ill-informed, unconcerned, and inactive on environmental issues.

Environmental decision-making operates at the juncture of science, economics, politics, and ethics. It has been an uphill battle to try to convince some government and industry officials and some environmentalists that unequal protection, disparate impact, and environmental racism exist. Nevertheless, grassroots activists have continued to argue and in many instances have won their case. Working together, community stakeholders can assist government decision-makers in identifying "at-risk" populations, toxic "hot spots," research gaps, and action plans to correct existing imbalances and prevent future threats.⁵ In order to accomplish their mission in an era of dwindling resources, environmental policymakers are increasingly turning to strategies that incorporate a *community-empowerment* approach. For example, community environmental protection (CEP) is being touted by the EPA as a "new" way of doing business.

Strengthening grassroots community groups can build a supportive social environment for decision-making. Residents and government authorities (local, state, and federal), often working together through creative partnerships with grassroots community groups, universities, nonprofit agencies, and other institutions, can begin solving environmental and health problems and design strategies to prevent future problems in low-income areas and communities of color. But the US Environmental Protection Agency and other governmental agencies cannot resolve all environmental problems alone. Communities also need to be in the position to assist in their own struggle for clean, safe, healthy, livable, and sustainable communities.

THE RIGHT TO BREATHE CLEAN AIR

Before the federal government stepped in, issues related to air pollution were handled primarily by states and local governments. Because states and local governments did such a poor job, the federal government established national clean-air standards.

Congress enacted the Clean Air Act (CAA) in 1970 and mandated the EPA to carry out this law. Subsequent amendments (1977 and 1990) were made to the CAA that form the current federal program. The CAA was a response to states' unwillingness to protect air quality. Many states used their lax enforcement of environmental laws as lures for business and economic development.⁶

Transportation policies are also implicated in urban air-pollution problems. Automobile-choked highways create health-threatening air pollution.⁷ Freeways are the lifeline for suburban commuters, and millions of central-city residents are dependent on public transportation as their primary mode of travel.⁸ Are people of color concerned about air quality and transportation? The answer is yes. The air-quality impacts of transportation are especially significant to people of color, who are more likely than whites to live in urban areas with reduced air quality. . . .

Asthma is an emerging epidemic in the United States. The annual age-adjusted death rate from asthma increased by 40 per cent between 1982 and 1991, from 1.34 to 1.88 per 100,000 population,⁹ with the highest rates being consistently reported among blacks between the ages of 15 and 24 years during the period 1980-1993.¹⁰ Poverty and minority status are important risk factors for asthma mortality. Children are at special risk from ozone.¹¹ Children also represent a considerable share of the asthma burden, that affliction being the most common chronic disease of childhood. Asthma affects almost 5 million children under 18 years of age. . . .

The public health community has insufficient information to explain the magnitude of some of the air pollution-related health problems. However, they do know that people suffering from asthma are particularly sensitive to the effects of carbon monoxide, sulfur dioxides, particulate matter, ozone, and nitrogen oxides.¹² Ground-level ozone may exacerbate health problems such as asthma, nasal congestion, throat irritation, respiratory-tract inflammation, reduced resistance to infection, changes in cell function, loss of lung elasticity, chest pains, lung scarring, formation of lesions within the lungs, and premature aging of lung tissues.¹³

African Americans, for example, have significantly higher prevalence of asthma than the general population.¹⁴ A 1996 report from the federal Centers for Disease Control and Prevention shows

hospitalization and death rates from asthma increasing for individuals 25 years old or younger.¹⁵ The greatest increases occurred among African Americans. African Americans are two to six times more likely than whites to die from asthma.¹⁶ Similarly, the hospitalization rate for African Americans is 3.4 times the rate for whites. . . . Air pollution, for many environmental justice advocates, translates into poor health, loss of wages, and diminished quality of life.

THE THREAT OF ECONOMIC EXTORTION

Why were people-of-color organizations late in challenging the environmental imbalance that exists in the United States? People-of-color organizations and their leaders have not been as sensitive to the environmental threats as they have been to problems in education, housing, jobs, drugs, and, more recently, the AIDS epidemic. In some cases, they have operated out of misguided fear and speculation that environmental justice will erode hard-fought civil rights gains or thwart economic development in urban core neighborhoods. There is no evidence that environmental justice or the application of Title VI of the Civil Rights Act of 1964 has hurt business or "brownfields" (abandoned properties that may or may not be contaminated) redevelopment opportunities in communities of color.¹⁷ On the other hand, we do not have to speculate about the harm inflicted on the residents from racial red-lining by banks and insurance companies and the targeting of communities of color for polluting industries and locally unwanted land uses, or LULUS. The harm is real and measurable.

Grassroots groups in communities of color are beginning to take a stand against threatened plant closure and job loss as a trade-off for environmental risks. These threats are tantamount to economic extortion. This extortion has lost some of its appeal, especially in those areas where the economic incentives (jobs, taxes, monetary contributions, etc.) flow outside of the host community. People can hardly be extorted over economic benefits they never receive from the local polluting industry. There is a huge difference between the promise of a job and a real job. People will tell you, "You can't eat promises." Because of the potential

to exacerbate existing environmental inequities, community leaders are now questioning the underlying assumptions behind so-called trade-offs as applied in poor areas.

In their push to become acceptable and credible, many mainstream environmental organizations adopted a corporate model in their structure, demeanor, and outlook. This metamorphosis has had a down side. These corporate-like environmental organizations have alienated many grassroots leaders and community organizers from the larger movements. The environmental justice movement – with its egalitarian worldview and social justice agenda – offers an alternative to the more staid traditional environmental groups.

Local community groups may be turned off by the idea of sitting around a table with a waste-disposal giant, a government regulator, and an environmentalist to negotiate the siting of a toxic-waste incinerator in their community. The lines become blurred in terms of the parties representing the interests of the community and those of business. Negotiations of this type fuel residents' perception of an "unholy trinity," where the battle lines are drawn along an "us-versus-them" power arrangement. Moreover, overdependence on and blind acceptance of risk-assessment analysis and "the best available technology" for policy setting serves to intimidate, confuse, and overwhelm individuals at the grassroots level.

Talk of risk compensation for a host community raises a series of moral dilemmas, especially where environmental imbalances already exist. Should risks be borne by a smaller group to spare the larger groups? Past discriminatory facility-siting practices should not guide future policy decisions. Having one polluting facility makes it easier to site another in the same general area. The "one more won't make a difference" logic often becomes the dominant framework for decision-making. Any saturation policy derived from past siting practices perpetuates equity impacts and environmental injustice. Facility siting becomes a ritual for selecting "victims for sacrifice."

MOBILIZING THE GRASS ROOTS

It is unlikely that the environmental justice movement will ever gain unanimous support in

communities of color. Few social movements can count on total support and involvement of their constituent groups. All social movements have "free riders," individuals who benefit from the efforts of a few. Some people shake the trees, while others pick up the apples. People-of-color environmentalism has been and will probably remain wedded to a social-action and social-justice framework. The issues raised by environmental justice advocates challenge the very core of privilege in our society. Some people make money and profit off the misery of poisoning others. Some communities are spared environmental assaults because of industrial-siting practices of concentrating locally unwanted land uses in communities with little or no political power and limited resources. After all, American society has yet to achieve a race-neutral state where race- and ethnic-based organizations are no longer needed.

Although the color barrier has been breached in most professional groups around the country, blacks still find it useful to have their own organizations. The predominately black National Bar Association (NBA), National Medical Association (NMA), National Association of Black Social Workers (NABSW), Association of Black Psychologists (ABP), and Association of Black Sociologists (ABS) are examples of race-based professional organizations that will probably be around for some time in the new millennium.

Grassroots environmental organizations have the advantage of being closer to the people they serve and the problems they address. Future growth in the environmental movement is likely to come from the bottom up, with grassroots environmental groups linking up with social-justice groups for expanded spheres of influence and focus.

Communities of color do not have a long track record in challenging government decisions and private industries that threaten the environment and health of their residents. Many of the organizations and institutions were formed as a reaction to racism and dealt primarily with social-justice issues. Groups such as the NAACP, Urban League, Southern Christian Leadership Conference, and Commission for Racial Justice operate at the multi-state level and have affiliates in cities across the nation. With the exception of Reverend Joseph Lowery of the Southern Christian Leadership

Conference, Benjamin R. Chavis Jr. of the United Church of Christ's Commission for Racial Justice, and Reverend Jessie Jackson of the National Rainbow Coalition, few national black civil rights leaders and organizations embraced an ideology that linked environmental disparities with racism.¹⁸ It was not until the 1980s that national civil rights organizations began to make such links. This linking of institutional racism with the structure of resource allocation (clean environments) has led people-of-color social-action groups to adopt environmental justice as a civil rights issue, an issue well worth "taking to the street."

NIMBYism [not-in-my-backyard politics] has operated to insulate many white communities from the localized environmental impacts of waste facilities while providing them the benefits of waste disposal. NIMBYism, like white racism, creates and perpetuates privileges for whites at the expense of people of color. Citizens see the siting and unequal protection question as an all-out war. Those communities that can mobilize political influence improve their chance of "winning" this war. Because people of color remain underrepresented in elected and appointed offices, they must, most often, rely on indirect representation, usually through white officials who may or may not understand the nature and severity of the community problem. Citizen redress often becomes a political issue. Often the only science involved in the government response and decision-making is political science.

Who are the frontline leaders in this quest for environmental justice? The war against environmental racism and environmental injustice has been waged largely by people of color who are indigenous to the communities. People-of-color grassroots community groups receive some moral support from outside groups, but few experts are down in the trenches fighting alongside the warriors. On the other hand, it was the mothers and grandmothers, ministers from the churches, and the activist leaders from community-based organizations, civic clubs, neighborhood associations, and parents' groups who mobilized against the toxics threat. Few of these leaders may identify themselves as environmentalists or see their struggle solely as an environmental problem. Their struggles embrace larger issues of equity, social justice, and resource distribution. Environmental justice activists question

the fairness of the decision-making process and the outcome.

Many environmental justice disputes revolve around siting issues, involving government or private industry. Proposals for future sites are more likely to attract environmentalists' support than are existing sites. It is much easier to get outside assistance in fighting a noxious facility that is on paper than one that is in operation. Again, plant closure means economic dislocation. Because communities of color are burdened with a greater share of existing facilities — many of which have been in operation for decades — it is an uphill battle of convincing outside environmental groups to support efforts to close such facilities.

It makes a lot of sense for the organized environmental movement in the United States to broaden its base to include people-of-color, low-income, and working-class individuals and issues. Why diversify? People of color now form a potent voting bloc. Diversification makes good economic and political sense for the long-range survival of the environmental movement. However, it is not about selfishness or "quota filling." Diversification can go a long way in enhancing the national environmental movement's worldwide credibility and legitimacy in dealing with global environmental and development issues, especially in Third World nations.¹⁹

NOTES

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