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Wasted Space/Potential Place: Reconsidering Urban Streets

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Think about the enormous number of streets that exist in the American metropolitan landscape, and think, if you will, about waste. In America, 60-, 70-, and 80-foot street rights-of-way are common in residential areas, and so-called "arterial" streets are routinely wider. The waste, in so many ways, is immense when experience shows that 40- to 50-foot widths can handle local vehicular, pedestrian, and cycle traffic—and accommodate street trees.[1]

The rationale for wide streets has long been to provide plentiful light and air to dwellings. This was a well-intentioned reaction to the abysmal environmental and sanitary conditions of the nineteenth-century industrial city.[2] But in America we have overdone it. Across the world, people live comfortable, healthy, safe and rewarding lives along streets where building faces are no more than 50 feet apart.

Wasted Space in Residential Streets

The bulk of streets in American cities are residential, and when they are wider than necessary they waste space in ways we seldom imagine. Consider the impact over one square mile of a 60- versus a 50-foot right-of-way. If blocks are 400 feet long and 200 feet wide, there will be about 15 fewer blocks in the former case. That equates to 300 fewer single-family lots if the typical parcel is 40 feet wide, and 480 fewer lots if it is 25 feet wide. With 80-foot rights-of-way, there will be 41 fewer blocks and 820 to 1,312 fewer parcels.

These are conservative examples, and it takes little imagination to envision other consequences of overly wide streets: decreased quantity and greater cost of housing; greater cost of public infrastructure; less accessible community services; less likelihood of shops within walking distance; increased travel time between places, greater fuel usage, and increased carbon dioxide pollution; and so on.

Even over a moderately extended urban area, the cumulative effects can be huge. Yet in many cities and suburbs this extra space already exists, and there may be little that can be done to counter its negative impacts except increase development densities within blocks and add mixed uses—if this is possible given often inflexible zoning regulations.

What, though, of the wasted space within local rights-of-way themselves? Might we imagine ways to increase its social and environmental value? Clearly, we can.

First, think about what streets really are. In physical terms, they form a web of public space—often gridlike, but with variations—that covers an urbanized area. The filaments of the web, the streets themselves, have length and width, and their combined area is sizeable. Consider again a square mile of 400- by 200-foot blocks. If streets occupy 80-foot rights-of-way, they will comprise about 250 acres, 39 percent of the total. With 60-foot rights-of-way, they will occupy 206 acres, or 32 percent. From these examples, it is easy to understand how streets generally occupy between 25 and 35 percent of all land in American cities.[3]

Next, think about how streets are used. More often than not most of the right-of-way is given over to vehicles. The streets in San Francisco's Sunset District are 60 and 80 feet wide. In a 60-foot right-of-way, the vehicle roadway typically takes up 45 feet and the sidewalks the remaining 15 feet. This means 75 percent of the street space is dedicated to vehicles. In an 80-foot right-of-way, the roadway typically occupies 62 feet, fully 78 percent of available space. These are local streets lined primarily with single-family houses. The disproportionate allocation of space to cars is mind-boggling.

Finally, think about the materiality of American streets. Many are wholly, or almost wholly, paved with asphalt and concrete, and the earth beneath these nonporous surfaces lies barren. Sometimes there are trees, sometimes not; but often, where trees do exist, they are too widely spaced. Moreover, few streets contain flowers, artwork, or places to sit.

Now think again about the potential of streets. Imagine them as a simple, unbuilt, publicly owned web of space, with nothing on or under them. How would people choose to use such a valuable community resource? What combination of needs could they meet to make life better for everyone?

For sure, there are many needs that city streets have classically provided for—getting from place to place, accessing property, allowing light and air to buildings, distributing public water and removing waste, and providing escape routes from fire—and these must remain considerations. But there are clearly many other ecological and social needs that streets could also fulfill.

Ecological Needs

The environmental crises facing the world today are so potentially disastrous it seems almost crazy not to use publicly owned resources to the fullest extent to address them. Furthermore, because streets form a web, any ecological benefits they may provide can be distributed across an entire city. Consider just four of the ecological purposes streets could serve: protecting and maintaining groundwater supplies, counteracting the urban heat-island effect, combating global warming, and providing wildlife habitat and corridors. There are relatively easy ways to use a city's web of residential streets to accomplish these purposes.

Runoff from typical asphalt and concrete street surfaces concentrates accumulated pollutants in storm sewers—which commonly drain, untreated, into streams and lakes

and bays. Minimizing nonporous surfacing and providing green swales and retention basins (where plants work to filter out harmful toxins) can reduce pollution, maximize on-site rainwater infiltration, and help recharge groundwater supplies. Porous paving materials—there are so many available—can direct water to where it ought to go.

Minimizing heat-absorbing surfaces on streets and planting shade trees can also have a valuable ecological effect. Domes of warm air normally hover over urbanized areas because the hard surfaces prevalent there—concrete, asphalt and stone—absorb the sun's rays, causing both surface and ambient temperatures to rise. Large street trees can help shade hard surfaces from the sun, decreasing this harmful heat-island effect by as much as 20°F over surrounding rural areas. They may also contribute directly to cooling through evapotranspiration.

As street trees grow, they also absorb carbon dioxide from the atmosphere. Significant numbers of street trees, adding up to a real urban forest, can thus help combat global warming by storing carbon in their roots, trunks, branches and leaves.

A forest of street trees creates habitat for birds, insects, and other animals as well. And because of its weblike nature, this can create corridors for safe animal movement from outlying open spaces to city parks.[4]

Professionals know how to design "green" streets to serve these ecological roles: plant trees, build retention swales, and expose the earth.[5] What is needed is community desire and political will, spurred by responsible professionals, to displace cars from the preeminent position they hold in street design.

Health and Social Needs

The priority accorded vehicles is clearly evident in the Functional Classification System that the transportation engineering profession uses to define all streets. The system presumes streets have just two main functions—providing for movement (assumed to be by means of motor

Above: Bicycle lanes on a roadway in the Netherlands.

Left: The right-of-way of a typical residential street in the Sunset District of San Francisco is wholly paved and shows the disproportionate allocation of space to cars. **Right:** The Ocean Parkway Mall in Brooklyn, NY, acts as a linear park for strolling, while also serving as a major traffic carrier.

vehicle), and providing for access to property. Important as these functions may be, people have many other needs and desires. Why shouldn't the web of public space in streets serve more of them?

For instance, streets can and should have a health function. Large numbers of Americans, especially children, suffer from obesity. Research indicates that a lack of daily physical activity is a major cause and that the problem may in coming years lead to a diabetes epidemic. The linear nature of streets makes them ideal for walking, jogging and biking, and their distributed nature makes them readily available to everyone.

Many people, however, will only use streets for exercise if they are attractive, comfortable and safe.[6] Fortunately, this isn't so hard. It means planting trees (for shade, aesthetics, and perhaps protection from vehicles), clearly marking paths that motor vehicles can't intrude upon, building well-designed crosswalks and intersections, and developing strategies for traffic-calming.

Another important function of streets is public gathering and celebration. Traditionally, such activities have taken place in parks. But in already developed neighborhoods, little new land exists to create more such public places. The space embodied in streets may represent the only viable option for creating new parks.

Fortunately, many street rights-of-way are so wide that parks can be built within them. A 28-foot-wide park strip placed in the middle of an 80-foot residential street still leaves room for two 16-foot roadways and two 10-foot sidewalks. If a block is 400 feet long, the result will be a quarter-acre linear park. Put this park to one side and incorporate one of the sidewalks into it, and it will seem even wider.

Wasted Space in Arterial Streets

So far I have focused only on wasted space in local streets. But wasted space occurs in major streets as well. Streets intended for nonlocal traffic, so-called "arterial" streets, typically have rights-of-ways that are 80, 100, or 125 feet wide; and sometimes they may even be 150 feet wide, or wider. Since the 1930s, when traffic engineers first began to grapple with a seemingly ever-increasing number of cars and trucks in cities, their principal concern for arterial roadways has been to ensure a high degree of vehicle mobility and the ability to widen them if they become congested.

To facilitate through-mobility along urban arterials, engineering standards recommend designing for operating speeds of 30 to 60 miles per hour. This means providing four to eight travel lanes, each 11 to 12 feet wide, dedicated left-turn lanes within wide central medians, and dedicated right-turn lanes near intersections. Parking lanes are not recommended, since arterials are supposed to provide only limited access to abutting properties; but where they occur they are to be 10 to 12 feet wide.[7]

While these recommendations are intended to create safe and efficient conditions, they embody values and assumptions that many communities may, indeed should question.

Should any city street be devoted primarily to through-movement? Or should all streets offer some balance between local place-based needs and through movement?

What about designated arterials that also function as local shopping streets or which run through residential areas? Do travel and parking lanes really need to be 10 to 12 feet wide when passenger cars are at most 7 feet wide, and buses and trucks are at most 8.5 feet wide?

Are wider lanes on city streets really safer than narrower lanes? Recent research suggests wider lanes are associated with higher driving speeds and worse pedestrian accidents.[8]

Perhaps most important, is planning for future mobility best accomplished by providing an initial excess of street right-of-way so roadways can later be widened? A more sustainable strategy might be to rely on an increase in mobility *options*, such as biking, walking and transit.

If a community decides the answer to any of the above questions is no, it will likely find wasted space for reuse in its arterial streets, as well as in its residential ones.

Some Design Possibilities

There are many possibilities for how urban streets might be redesigned and used. There are also many precedents to learn from and be inspired by.

In Setagaya, Japan, a part of Tokyo, very narrow residential streets provide space for daily life as well as vehicle movement by accommodating small seating areas in the 3- to 4-foot green spaces between the roadway and adjacent residences. When pedestrians and autos use the same surface, drivers understand they should go slowly.

At the other end of the spectrum, tree-lined parkways such as Eastern and Ocean Parkways in Brooklyn, New York, provide magnificent linear park and promenade spaces, while also serving as major traffic carriers.[9]

A central role of Barcelona's many boulevards, such as the Paseo de Gracia and the Ramblas, is to provide space for evening promenading. Wide walks in these cases are more important than wide roadways.

Many examples exist of successful street tree plantings. The famous streets of Seville are filled with orange trees. In Belem, Brazil, passers-by can eat the ripened fruit from its mango trees. In some Chinese cities, street trees are planted in multiple rows with different maturities so they can be harvested periodically and still provide a canopy of shade.

Streets in many French cities are used for weekly public markets. The simple addition of regularly spaced recessed grommets within the street surface facilitates quick set-up of modular canvas and aluminum market stalls.

The streets of Vancouver, British Columbia, host an incredible urban forest—more than 130,000 trees in all, tracked in a computerized inventory, and valued at more than $500 million. Such extensive planting is aided by the city's system of alley access to residential garages, which eliminates the need for disruptive curb cuts. A 1920s general plan also wisely called for closely spaced plantings on residential streets, preferably all of the same species per block.[10] Such coordination now provides striking seasonal

Above: Planted with trees, Vancouver's alleyways provide access to garages, thus limiting the number of curb cuts and contributing to the overall walkability of neighborhoods.

displays, contributing to a local sense of place. Some blocks stand out with brilliant color in the fall; others with spring blossoms; others in winter with a cathedral-like structure of bare branches.

Most of Vancouver's neighborhood streets also promote a balance between vehicle, bicycle and pedestrian uses, and between paved and permeable surfaces. Rights-of-way are typically 66 feet wide, within which the roadway takes up just 26 to 28 feet. Two-way vehicle travel is generally allowed, as is parking on both sides of the street. Traffic moves slowly, and bicyclists share the roadway with cars. Street trees are planted on wide lawns that continue the length of the block. The 20-foot-wide rear alleys are often unpaved and feel like rural paths.

Vancouver also has an extensive system of linked "greenway" walking and biking paths. Most notably, a waterfront pathway, 25 kilometers long, rings the downtown and adjacent neighborhoods. And where new high-density residential neighborhoods are being built on obsolete industrial lands, developers are required to build walks that continue this system and that link into the new neighborhoods. Pedestrian greenways can be found in new neighborhoods away from the waterfront as well.

These examples just begin to suggest the wealth of possibilities for streets. But communities must see beyond current taken-for-granted ideas, evolve new expectations, and effect necessary social and institutional changes.

It is instructive to remember that streets used to be different than they are today. Modern "improvements" were not universally embraced when they were first put in place. In the late 1800s, for example, people protested the asphalting of local neighborhood streets. And in the 1920s and 1930s pedestrians had to be trained to cross at intersections and wait at traffic signals.[11]

Above: San Francisco's redesigned Octavia Boulevard provides a carefully balanced integration of user needs.

Reclaiming Space through Balancing

Ecologically and socially responsible street design calls for balancing how the public space of streets is used. Yet, for a professional, becoming an advocate for street balancing requires a willingness to vigorously question street-design standards and norms. In addition to requiring wide vehicle lanes, these often work against street trees by requiring, among other things, that they be planted 50 feet or more back from intersections. Supposedly, this preserves lines of sight, although, oddly, parked cars aren't usually so restricted.[12]

Taking on entrenched standards is not easy, because city officials are extremely hesitant to deviate from accepted norms for liability reasons. It requires constant, insistent fighting over feet and inches. But it's those critical feet and inches that make the difference between a balanced pedestrian-friendly street and an unbalanced vehicle-oriented one. The following strategies may be useful:

• Encourage people to think in terms of achieving a reasonable balance between needs, rather than designing for worst-case, "what-if" scenarios. When designing multiway Octavia Boulevard, which replaced a four-block section of San Francisco's Central Freeway, we used the simple phrase "No one gets everything; everyone gets a lot." It helped the community and our client, the San Francisco Transportation Authority, understand the concept of complex shared-use wholeness, the essence of a good multiway boulevard.
• Know engineering standards inside and out. Understand the assumptions embedded in them, and evaluate where flexibilities lie.
• Use empirical evidence to counter "musts" about wide lane widths, wide turning radii, and large tree setbacks. Point out places—preferably in the same city—where narrow lanes, small radii, and closely spaced street trees exist, traffic works fine, and accidents aren't prevalent.
• Question standards that don't seem right. Recently, we were advised that each person waiting for a bus requires one square meter of unencumbered space. Having three people, two of them transit planners, easily stand in a square meter marked on the floor raised serious doubt about the standard.
• Have fun! Professionals can show communities many possibilities they may never have considered. When communities see such variety, they are more likely to challenge professionals—so often the worst naysayers—to create designs that provide for fun as well as function.

Notes

1. These assertions come from experiential observation, but they are supported by the dimensional recommendations of the American Association of State Highway and Transportation Officials (AASHTO). See AASHTO, *A Policy on Geometric Design of Streets and Highways* (Washington, D.C., 2001), p. 396.
2. See, for example, Eran Ben-Joseph, *The Code of the City: Standards and the Hidden Language of Place Making* (Cambridge, MA: MIT Press, 2005); Peter Hall, *Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century* (Cambridge, MA: Blackwell, 1988); and Stephen Ward, *Planning the Twentieth-Century City* (Chichester, U.K.: John Wiley & Sons, 2002).
3. See Allan B. Jacobs, *Great Streets* (Cambridge, MA: MIT Press, 1993), p. 6.
4. For a detailed discussion of the benefits of street trees, see Nicholas Low, Brendan Gleeson, Ray Green, and Darko Radovic, *The Green City: Sustainable Homes, Sustainable Suburbs* (Abingdon, U.K.: Routledge, 2005); and Anne Whiston Spirn, *The Granite Garden: Urban Nature and Human Design* (New York: Basic Books, 1984).
5. For a detailed discussion of green streets, see Portland Metro, *Green Streets: Innovative Solutions for Stormwater and Stream Crossings* (Portland, OR: Metro, 2002); and Portland Metro, *Trees for Green Streets: An Illustrated Guide to Selecting Street Trees that Reduce Stormwater Runoff from Streets and Improve Water Quality* (Portland, OR: Metro, 2002).
6. The many dimensions of the public health/urban form question, and accounts of the latest research, can be found in Howard Frumkin, Lawrence Frank, and Richard Jackson, *Urban Sprawl and Public Health: Designing, Planning, and Building For Healthy Communities* (Washington, D.C.: Island Press, 2004).
7. See AASHTO, *A Policy on Geometric Design of Streets and Highways* (Washington, D.C., 2001), chapter 7.
8. See, for example, J.L. Gattis and Austin Watts, "Urban Street Speed Related to Width and Functional Class," *Journal of Transportation Engineering*, May/June 1999, pp. 193-200.
9. For more about Eastern and Ocean Parkways, see Chapter 3 in Allan B. Jacobs, Elizabeth Macdonald, and Yodan Rofé, *The Boulevard Book: History, Evolution, Design of Multiway Boulevards* (Cambridge, MA: MIT Press, 2002).
10. Vancouver Town Planning Commission, *A Plan for the City of Vancouver, British Columbia* (Vancouver, B.C.: Town Planning Commission, 1929).
11. This history is well chronicled in Clay McShane, *Down the Asphalt Path: The Automobile and the American City* (New York: Columbia University Press, 1994). For direct sources of this history, look to articles printed in *The American City* magazine during the 1920s and 30s.
12. The recently published report "Street Trees and Intersection Safety," available on the University of California Transportation Center website (http://www.uctc.net/papers/papers.html), presents the findings of a research project conducted by the author directed at determining whether street trees near intersections really cause viewing problems. The findings suggest that such trees do not cause substantial visibility problems, but that parked cars do.

All photos courtesy of author.