Home

At Home in the Zone

Creating livable streets in the U.S.

By Bruce Appleyard, AICP, and Lindsey Cox

Dan Burden

Wall Street in downtown Asheville, North Carolina, (left) incorporates some of the traffic calming techniques associated with home zones: cobblestone-like pavement, bollards, lampposts, and parking. Slow vehicle speeds encourage people to walk in the street. Above: elements of a woonerf in Denmark, one of the European countries that has adopted the concept. Right: Woonerf residents at an alfresco birthday party in Copenhagen.

Above and left: Ben Hamilton-Baillie; cover above by Bruce Appleyard

> "We should raise our sights for the moment. What could a residential street—a street on which our children are brought up, adults live, and old people spend their last days—what could such a street be like?"
>
> Donald Appleyard, *Livable Streets*, 1981

Even after 25 years, these words remind us that streets, which constitute most of the public space in our cities, are for people, not just cars. Streets are our most accessible public spaces. They should be places where neighbors socialize and build community, and where young and old alike engage in activities that strengthen their physical and creative health. Thus, the guiding design principle for neighborhood residential streets should be livability.

The street is a place where drivers, pedestrians, and bicyclists engage in informal negotiations over who's in charge. This split-second choreography is strongly influenced by how the street stage is set, both physically and visually. On streets engineered for fast-moving cars—with their wide lanes, traffic signals, and striping—the noise, exhaust fumes, and threat of injury force pedestrians and bicyclists to retreat. The result is a loss of opportunities for neighborhood residents to build stronger and safer communities.

Now consider the alternative: We can design streets that incorporate traffic calming devices and placemaking elements such as street furniture, play areas, and landscaping. We can modify our existing street standards and vehicle codes to create neighborhood streets that work for people, as well as cars, and that allow the negotiations between residents and drivers to take place on a more equal footing.

The model

The shared street known as a woonerf is a model for the kind of street we are talking about. The concept originated in the late 1960s in the Dutch city of Delft. Local residents who were upset about cut-through traffic in their neighborhood tore up their brick streets and replaced them with traffic-slowing serpentine paths.

These shared streets came to be known as woonerfs, translated literally as "residential yards," making the point that neighborhood streets serve homes rather than cars. (They have also been described as "living yards," "streets for

living," "living streets," and, in Great Britain, as "home zones," which can also refer to a network of neighborhood streets.)

The newest phase in the evolution of this concept is the "shared spaces" movement that is emerging across Europe. Variously referred to as "legible streets" or even "naked streets," these streets have been stripped of the signs and markings that make them a conduit for speeding traffic. They are designed as integral extensions of the surrounding community.

Woonerfs were officially endorsed by the Dutch government in 1976, when a set of traffic regulations for the shared street concept was adopted. The idea spread to other countries, including Germany, Sweden, Denmark, Britain, Japan, and Israel. Today, the Netherlands has about 6,500 versions of the woonerf.

Donald Appleyard's *Livable Streets* gave U.S. audiences the first handbook on traffic calming and the then-new Dutch woonerf program. Appleyard viewed the woonerf as the "latest stage in the evolution of the protected neighborhood," helping to fulfill the promise of what our residential streets could be.

Definition

What exactly is a woonerf? It's a shared street that incorporates a range of modes and activities. It allows for moving traffic and parking but primarily is designed to encourage neighbors to socialize and to permit children to play safely in front of their homes. Traffic speed is slowed by both physical and visual measures.

The Dutch initially set the woonerf traffic speed at about 10 miles an hour, the pace of a walking horse. (Most people walk at about two to four miles per hour.) A key traffic-slowing design strategy is to narrow travel lanes while emphasizing the street as a residential place rather than as a channel for traffic.

According to Donald Appleyard, the design philosophy of the woonerf is to create a kind of "gestalt" message that the streets belong to the residents, and that the car is only one of the users. Drivers are made to feel that it is natural to drive slowly by such physical and visual measures as these:

- Creating clear and distinct gateways that celebrate and enhance the neighborhood's identity, announcing to drivers that they are guests in a neighborhood space.
- Adding curves to the travel lane to break up the driver's sight line.
- Using features that slow traffic while serving the needs of residents: benches, play equipment, landscaping.
- Eliminating continuous curbs, thus removing the channel that encourages drivers to speed. Instead, drivers and pedestrians are placed on the same level, and drivers are directed by bollards, street furniture, trees, and varied pavement treatment.
- Providing parking, but with intermittent spacing so the woonerf does not feel like a parking lot.

The woonerf concept was a new and powerful idea that legally changed the rules of traffic behavior within a protected area. It gives residents stronger legal rights over their streetscape by placing the burden of proof on the driver in the event of an accident.

All in all, these measures give residents a greater sense of comfort. A 2003 study by public health consultant Peter Jacobsen showed that having more people participate in the street environment actually improves safety. He found that relative collision rates declined as the numbers of pedestrians and cyclists increased, suggesting that drivers exercise more care when they expect people to be using the street. This suggests that there is a "tipping point" that we need to consider when redesigning a street environment for community reengagement.

In the late 1990s, Great Britain imported the woonerf concept in the form of a "home zone" initiative. The idea was supported by two nonprofit organizations, Transport 2000 and the Children's Play Council. Early results showed an increase in the number of children playing in the street in over half of the home zone projects. Some home zones also have seen falling crime rates and rising levels of community activity in the form of neighborhood litter pickup, festivals, and street parties.

There are subtle differences between home zones and woonerfs. Woonerfs in the Netherlands emphasize creating a sense of place, whereas the British version focuses more on easing traffic and reducing accidents.

Importing an idea

Will shared streets or home zones work in the U.S., where vehicles, driving habits, neighborhoods, and homes are much different than in Europe? We believe they will. As housing and land prices rise in the U.S., the residential street is becoming increasingly valuable as a location for both physical and social activity. That makes the woonerf or home zone a desirable design model.

To apply the concept in a far different environment, however, we need a new strategy, one that is suitable for high-density urban neighborhoods, low-density suburbs, and even rural areas.

The design goal is to encourage motorists to drive with caution and at low speeds so that pedestrian activity and vehicular movement may be integrated on one shared surface. The key to lowering speed is to change the "feel" of the street and the attitude of the drivers. That requires a multipronged approach, combining engineering, education, and enforcement.

Step one is to design the street so that drivers think of themselves as guests. That means making use of such traffic calming measures as signage, road narrowing, speed tables, varied pavement, and striping. Britain's home zone design guidelines recommend that such speed control measures be spaced no farther apart than 30 meters, or 100 feet. (The Dutch recommend a distance of about 50 meters.) The guidelines also recommend that forward visibility should not "significantly" exceed about 12 meters (40 feet).

As part of this process, we must ask ourselves, "How wide do our streets need to be to accommodate cars, trucks, and fire engines?" In Europe, the recommended travel lane width ranges from nine to 10.5 feet.

Nor are narrower streets necessarily unsafe. Engineer Peter Swift looked at the relationship between the physical characteristics of streets and the number of accidents. He found that the typical 48-foot-wide street had a crash rate that was 18 times higher than that of a 24-foot-wide street.

To enhance the home zone's sense of identity as a neighborhood space, local officials can remove the conventional straight stretches of pavement, allowing instead for bends in the travel lane. They can also install physical barriers such as bollards to help reduce car speed. The resulting "outdoor living rooms" can be furnished with benches, plantings, and play equipment.

There is general agreement that home zones should accommodate two-way traffic (one-way would encourage speeding). It is important, however, to limit passing to appropriate places. Britain recommends a minimum traffic lane of 9.9 feet with passing bays of about 15 feet every 130 feet. If the passing bays are widened to 20 feet, they can double as staging areas for emergency responders.

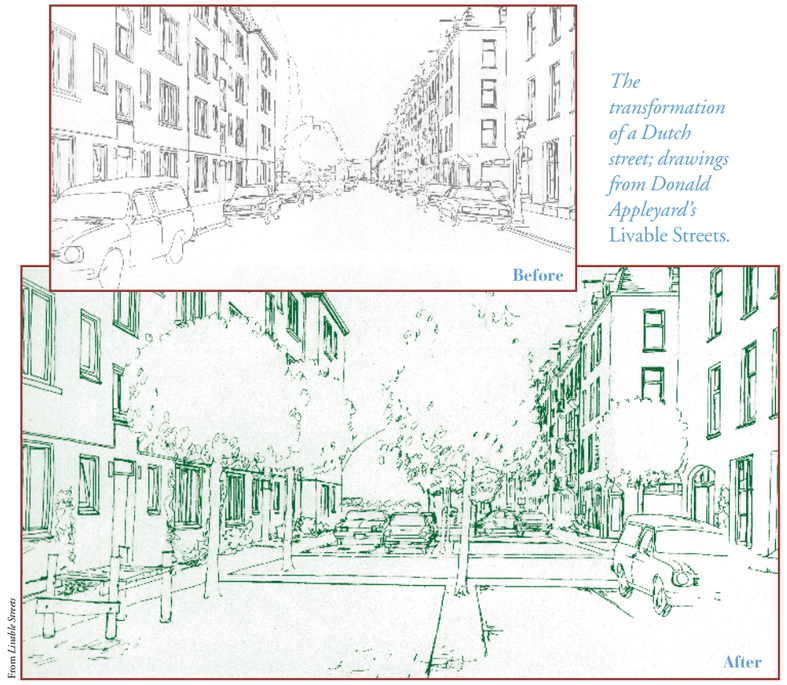
Learning the rules

Education is key to the success of a home zone. That means driver education courses and testing, as well as promotional campaigns to raise drivers' awareness of how they should modify their behavior when they enter the home zone. When it comes to enforcement, it may be necessary to rewrite driver liability laws to make it clear that pedestrians and cyclists have priority.

Another important goal is to emphasize the home zone's function as public space for children and families. Creating a series of outdoor living rooms, each with its own unique character, will make it clear to drivers that the home zone is a special place. Adding spaces for both formal and informal public art, whether temporary (chalk drawings and sand castles) or permanent (murals and sculptures), will add to the atmosphere.

Robin Moore and Susan Goltsman, principals of Moore Iacofano Goltsman and internationally renowned experts in designing learning environments for children, put it this way: "Neighborhoods need to be designed for children, and since streets make up most of the open space in a neighborhood, it is logical that they be places for play and community gathering." Children thrive in spaces "that are diverse in character, with different kinds of surfaces, adequate space for street games, and places where they can build things such as sandboxes." That description would apply to home zones as well.

Generally, traffic should be discouraged. Signage and full or partial barriers can block entrance to the home zone street, or prohibit turns. On a larger level, neighborhood street networks can be designed to avoid channeling traffic onto the street and to provide adequate travelways for all users, including cyclists. Appropriate paving (colored or stamped pavement, for instance) can also encourage pedestrian use of the street.



From *Livable Streets*

The transformation of a Dutch street; drawings from Donald Appleyard's Livable Streets.

Steven Schepel, International Institute for the Urban Environment

A woonerf in Delft, the Dutch city where the concept originated.

Homes should be designed to have a strong relationship to the home zone street. One way to accomplish that is through the orientation of rooms, doors, and windows. Residents should have direct views of the outdoor living room from their indoor living room, enhancing the sense of safety and community.

On-street parking helps to calm traffic. However, an effort should be made to avoid turning the street into a parking lot by breaking up the parking areas with plantings, street furniture, play equipment, and so on.

Steven Schepel, the former manager of the National Sustainable Safety Program in the Dutch Ministry of Transport, adds these recommendations:

- Do not hide playgrounds. Expose them in order to show that this is "a street for living."
- Draw attention to places where people and cars might collide: crosswalks, bicycle routes, and building entrances.
- Provide attractive seating for adults who are watching young children.
- Offer secure bicycle parking, which does not take up much space. One car occupies the place of 12 bicycles.
- Create tasteful signs. Schepel observes, "You wouldn't like to have these things in your living room, so try to minimize them in number and impact."

Steven Shepel, International Institute for the Urban Environment

The Delft woonerfs emphasize the street as a residential place rather than a channel for traffic. Driving speed is limited to about 10 miles an hour. Below: A neighborhood street in southeast Portland, Oregon, has been closed for a block party. Streets in this part of the city are generally narrow and interconnected.

Health and Safety

Giving children the chance to engage in physical activity in front of their homes helps them to develop physical coordination and cognitive and social skills. Such accessible public space further contributes to the health, welfare, and livability of the neighborhood in the following ways:

• Slow traffic makes physical activity safer for the most vulnerable, the young and the old. A pedestrian struck by a vehicle going 30 miles an hour is eight times as likely to be killed as one hit at 20 miles per hour.

• Increasing opportunities for physical activity helps to reduce the incidence of chronic diseases such as diabetes and hypertension. In addition, lowering traffic volume cleans the air and helps to reduce respiratory ailments.

• Crime rates have been shown to go down when the sense of community is enhanced. At the same time, property values increase. The Dutch government found that property values were 10 to 15 percent higher for woonerf residents.

Aaron Tarfman, www.youthedpower.org

• Take advantage of the multifunctional aspects of various elements. As Donald Appleyard wrote, "a tree is an obstacle, but it is also part of the greenery; a small hill can force cars to the side, but is also an object for children's play; a pillar in front of your door prevents cars from passing too close, but it also marks your entrance, and it is easy to put your bike up against it."

Finally, consider emergency response. A major requirement for creating effective home zones is to ensure that emergency vehicles can safely enter and exit, and maneuver through the street. According to retired fire chief Paul Davis, a 9.5-foot-wide fire truck (including mirrors and equipment) requires a 35-foot turning radius. Involve emergency responders early and develop collaborative solutions. Discuss the possibility of using smaller, more maneuverable vehicles.

Other guidelines: Prohibit parking 20 to 35 feet from an intersection to allow fire trucks to make the turn. Design tight corners and curb extensions so that fire trucks can maneuver over them if necessary. Create 20-foot emergency vehicle staging areas every 100 feet. Establish extra-large no-parking zones or curb extensions adjacent to fire hydrants. Make home zones part of an interconnected network of streets (no cul-de-sacs).

Also consider providing alley access, putting electric lines underground, using reflective street signs, and placing fire hydrants at intersections.

Choose your streets

Home zones should ideally be on streets that do not carry much traffic—about 100 vehicles during the afternoon peak hour when the likelihood is highest for conflict between vehicles and people, including children playing in the street.

The home zone streets should also be relatively short. Following street connectivity guidelines established by University of California, Davis professor Susan Handy and others, we recommend a length of 300 to 500 feet. The British suggest that the home zone street network should have a quarter-mile radius, the standard distance most pedestrians are willing to walk.

How fast can drivers go? Five to 10 miles per hour on a home zone street would be ideal. But since most drivers in the U.S. are used to higher speeds, a stepped approach to lowering speeds in a zone will probably be necessary. Following British guidelines, the outer streets in a home zone network could start with a 20-mile-per-hour speed limit, with lower speeds on streets nearer the center. Home zone streets may be linked to streets with faster traffic, but it is then essential to design distinct gateways with signs, special paving, changes in elevation, and so on.

An additional caveat is to win the support of a strong majority of residents. Philadelphia's Play Street program, an early version of a home zone, required at least 75 percent resident approval.

Home-grown zones

In many older cities in the U.S., primarily on the East Coast, one finds narrow streets and alleys that effectively function as home zones.

Since 1949, New York City has designated "play streets" around public schools that lack adequate yard or auditorium space. Philadelphia had over 500 designated play streets in 2003. These streets are closed mainly during the summer. Removable barriers and signs bar all traffic during certain hours of the day. In contrast, home zones do not bar all traffic; they blend car, bike, and pedestrian traffic at all times.

In Asheville, North Carolina, a downtown commercial street called Wall Street incorporates some of the traffic calming techniques associated with home zones: cobblestone-like pavement, bollards, lampposts, and parking. Slow vehicle speeds encourage people to walk in the street. Such shopping streets, designed for slow-speed shared use, have also been developed in the Netherlands, where they are known as "winkelerfs" ("winkel" means shopping or commerce).

Two moderate-income housing projects were developed in Boulder, Colorado, in the 1980s based on the woonerf concept. One project, the Cottages, consists of 40 owner-occupied condominiums. The second, Bridgewalk, has 123 rental units. In each case, a single loop street curves through the complex, around bollards and landscaping, to create a space to be shared by pedestrians, bicyclists, and motor vehicles. Cambridge, Massachusetts, plans to convert two streets near Harvard University into shared streets over the course of the next year.

At the national level, the home zone concept has been recognized by the Federal Highway Administration in its *Pedestrian Facilities Users Guide* as a design tool to "provide safety, mobility and enhanced livability for street segments and neighborhoods." The next step at the federal level is to provide specific guidelines for developing home zones.

We are currently working with the California Center for Physical Activity and the State and Local Injury Control Section of the California Department of Health Services to provide technical assistance to communities interested in developing their own version of a home zone.

One potential pilot neighborhood is in San Ysidro, just north of the Mexican border, where people, vehicles, and the front doors of homes already share the street space. With modest enhancements—special paving, street furniture, traffic calming measures, and play areas—these streets and alleys could provide a model for developing home zones in other neighborhoods throughout the U.S.

The European examples show us that woonerfs and home zones are effective tools for establishing livable streets—environments that facilitate social interaction and physical activity. Home zones encourage cars to travel slowly, safely, and quietly, providing a comfortable environment where neighbors feel encouraged to meet and talk, and where children are free to play and explore. The emphasis of these shared streets is on the safety and quality of life of the people who live in a neighborhood—a worthy goal, we believe.

It is time for us to create a national model to spread the idea to all of our urban and suburban communities.

Resources

Anniversary. This year marks the 25th anniversary of the 1981 publication of Donald Appleyard's *Livable Streets*. Bruce Appleyard is currently working on a new, expanded edition. "Throughout my life," he says, "I have learned how important the book was to so many people. It dramatically changed their view of the design of our streets and neighborhoods."

Earlier in *Planning.* "Livable Streets Revisited," by Bruce Appleyard, October 2002. "Planning Safe Routes to School," May 2003.

Conference. "A Conversation About Livable Streets" (S572), with Bruce Appleyard and Reid Ewing. Order a tape of this 2005 APA National Conference session at www.planning.org.

Quote. "My father's research showed how a livable street can weave a community together while an unlivable street can rip it apart." Donald Appleyard was killed by a speeding drunk driver in 1982, a year after the publication of *Livable Streets.*

More. See the online version of this article for additional resources.

Bruce Appleyard is an urban designer and transportation planner with Moore Iacofano Goltsman in Portland, Oregon. Lindsey Cox is a student at the Harvard School of Public Health and former project coordinator for the California Center for Physical Activity, a program of the California Department of Health Services.