Stormwater Best Management Practice

Right-Sized Residential Streets

Minimum Measure: Post Construction Stormwater Management in New Development and Redevelopment
Subcategory: Innovative BMPs for Site Plans

Description

Roadway planning is a delicate balance between meeting the needs of the community while also ensuring that roads are right-sized to provide the right amount of paved surface. Reducing the width of residential streets is a practice that can provide a number of community benefits, including a reduction in impervious surface and stormwater discharge. Currently, many communities require residential street widths of 32, 36 or even 40 feet. Wide streets include two parking lanes and two moving lanes, but they often provide more parking than is necessary and enable higher traffic speeds, which negatively affect pedestrian safety (NHTSA, 1999; SGA, 2019). In many residential settings, street widths can be as narrow as 22 to 26 feet without sacrificing emergency access, on-street parking, or vehicular and pedestrian safety. Developers can install even narrower access streets or shared driveways when they only need to serve a small number of homes. However, developers need to balance many competing interests and often have little flexibility because most communities require wide residential streets as a standard element of their local road and zoning standards. Revisions to current local road standards, based on an inclusive review of street design needs, are often necessary to promote the narrowing of residential streets. Communities typically accomplish this by implementing a more comprehensive Green Streets program.

Applicability

Narrower streets are appropriate for local streets with limited traffic, not collectors (roadways that connect local roads or streets with arterials) or arterials (freeways and multi-lane highways that supplement the interstate system). Combining narrow streets with green infrastructure can also enhance their benefits. Through a comprehensive Green Streets design, communities can substantially reduce stormwater discharge and become more livable. EPA's Green Streets handbook provides guidance on how to implement a holistic green streets program.

Right sized residential streets can reduce the impervious area in a neighborhood.

Siting and Design Considerations

Residential street design requires balancing competing objectives: design, speed, traffic volume, emergency access, parking and safety. Solutions for accommodating these competing interests may include alternative street parking configurations, vehicle pullout space, connected street networks, prohibitions on parking near intersections and smaller block lengths (Lukes & Kloss, 2008).

Other practices that complement right-sized streets:

- Permeable pavements
- Green parking
- Elimination of curbs and gutters
- Alternative street design and patterns
- Bioretention (rain gardens)
- Site design and planning strategies

Communities that want to change their road standards to permit narrower streets need to involve all the stakeholders who influence street design in the revision process. A common concern with right-sizing streets is a lack of parking. One method to preserve parking is to

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use curb bump-outs at intersections. These slow traffic and allow pedestrians and vehicles to see each other, increasing safety. Several communities across the nation have adopted narrower street width standards. Table 1 provides examples of these new standards.

Table 1. Examples of adopted narrow street widths.

Jurisdiction	Street Width (in Feet)	Parking Condition
Phoenix, Arizona	28	Parking both sides
Santa[EH1] Rosa, California	30	Parking both sides, less than 1000 average daily traffic
	26–28	Parking one side
	20	No parking
	20	Neck-downs at intersection
Orlando, Florida	28	Parking both sides, residential lots greater than 55 ft wide
	22	Parking both sides, residential lots greater than 55 ft wide
Birmingham, Michigan	26	Parking both sides
	20	Parking one side
Howard County, Maryland	24	Parking unregulated
Kirkland, Washington	12	Alley
	20	Parking one side
	24	Parking both sides, low density only
	28	Parking both sides
Madison, Wisconsin	27	Parking both sides, less than 3 dwelling units per acre
	28	Parking both sides, 3–10 dwelling units per acre

Source: WERF, 2009

In any location, efficient access for emergency responders and their vehicles is often the main concern when implementing narrow street designs. EPA provides a number of resources to help communities confront these emergency response challenges on their Smart Growth Streets and Emergency Response webpage.

Limitations

Real and perceived barriers hinder wider acceptance of narrower streets at local levels. Advocates for narrower streets need to respond to the concerns of local agencies and the general public. Some of the more frequent concerns about narrower streets include:

- **Inadequate on-street parking.** Research and local experience have demonstrated that narrow streets can adequately accommodate residential parking demand. A single-family home typically requires 2 to 2.5 parking spaces. In most residential zones, one parking lane on the street and a driveway can satisfy this parking demand.
- **Car and pedestrian safety.** Research indicates that narrow streets have lower accident rates than wide streets (NHTSA, 1999; SGA, 2019). Narrow streets tend to lower vehicle speeds and calm traffic. Furthermore, adding sidewalks can improve pedestrian safety. Although this might create additional impervious area, greater reductions in street width and incorporation of additional green infrastructure and green design strategies can decrease the net impervious area.
- **Emergency access.** With proper designs, narrower streets can easily accommodate fire trucks, ambulances and other emergency vehicles. The Uniform Fire Code requires that streets have a minimum of 20 feet of unobstructed width, which narrow street designs easily accommodate. EPA provides additional resources for addressing emergency access.
- **Large vehicle access.** Field tests have shown that school buses, garbage trucks, moving vans and other large vehicles can generally safely negotiate narrower streets, even with cars parked on both

sides. In regions with high snowfall, streets may need to be slightly wider to accommodate snow plows and other equipment.

- **Utility corridors.** Often it is necessary to place utilities underneath the street rather than in the right-of-way.

In addition, local communities may lack the authority to change road standards when state agencies retain the review of public roads. In these cases, narrowing can only occur on private streets that residents rather than local or state agencies maintain.

Examples of how communities have overcome various barriers and successfully implemented narrow street designs as standalone programs or as part of wider Green Streets programs are below:

- *Neighborhood Street Design Guidelines: An Oregon Guide for Reducing Street Widths*
- *Implementing Living Streets: Ideas and Opportunities for the City and County of Denver*
- *Green Infrastructure Opportunities and Barriers in the Greater Los Angeles Region*
- *Flexible Design of New Jersey's Main Streets*

Maintenance Considerations

Narrower streets should slightly reduce road maintenance costs for local communities because they have a smaller surface area to maintain and repair.

Effectiveness

Urban roads, sidewalks and parking lots make up two-thirds of the total impervious cover in urban environments (Lukes & Kloss, 2008). A reduction in width from 36 feet to 26 feet represents a nearly 30 percent reduction in impervious surface, which translates directly to reductions in stormwater discharge. Moreover, if developers can use the space they save for additional stormwater controls, such as grassed swales or bioretention systems, they can dramatically reduce stormwater discharge and roadway pollutants.

Cost Considerations

Because narrower streets require less material, they cost less to build than wider streets. Asphalt alone costs around $1 to $2 per square foot depending on the thickness and type (RSMeans, 2019), while typical road construction can cost more than $15 per square foot when considering full construction costs (ARTBA, 2019; FDOT, 2019). Reducing road width by just 4 feet can yield savings in asphalt paving costs alone of more than $35,000 per mile of residential street. In addition, because narrower streets produce less impervious cover and stormwater discharge, developers can realize additional savings by reducing the size and cost of downstream stormwater management facilities.

Additional Information

Additional information on related practices and the Phase II MS4 program can be found at EPA's National Menu of Best Management Practices (BMPs) for Stormwater website

References

American Road and Transportation Builders Association (ARTBA). (2019). *Funding, financing and cost frequently asked questions*. American Road and Transportation Builders Association.

Florida Department of Transportation (FDOT). (2019). *Cost per mile models for long range estimating*. Florida Department of Transportation.

Lukes, R., & Kloss, C. (2008). *Managing wet weather with green infrastructure: Municipal handbook—Green streets*. Prepared by the Low Impact Development Center for the U.S. Environmental Protection Agency.

National Highway Traffic Safety Administration (NHTSA). (1999). *Literature review on vehicle travel speeds and pedestrian injuries* (DOT HS 809 021). National Technical Information Service.

RSMeans. (2019). RSMeans data from Gordian [Online database]. 321216 Asphalt Paving.

Smart Growth America (SGA). (2019). *Dangerous by design 2019*. Smart Growth America.

Water Environment Reuse Foundation (WERF). (2009). *Green streets basics and design*. Using rainwater to grow livable communities.

Disclaimer

This fact sheet is intended to be used for informational purposes only. These examples and references are not intended to be comprehensive and do not preclude the use of other technically sound practices. State or local requirements may apply.