

Street Design and Emergency Response



The good: A marked pedestrian crossing with bulbout.



The bad: Too many lanes, no protection for people.



The ugly: No trees, no sidewalks, one helpless pedestrian.

When your community considers the use of traffic calming measures to add safety and pedestrian features to existing streets, smart-growth street design approaches should be structured to get things right in the first place. This fact sheet, which summarizes good street design strategies and tools, is intended for emergency response officials involved in reviewing new developments that are different from conventional, post-war suburban designs.

This is not uncharted territory. In a sense, smart growth is about going back to street designs that were once the norm. Typical street designs from colonial times to World War II featured short blocks, few dead-end or cul-de-sac streets, pavement as narrow as 20 feet, vertical curbs, small curb radii at corners, sidewalks everywhere, planting strips and often alleys.

Beginning in the late 1940's, and accelerating through the post-war suburban boom, streets took on a radically different character. The emphasis was on moving cars efficiently, and less about designing a public environment that met many needs, including those of pedestrians and bicyclists.

Compared with pre-war designs, conventional suburban streets have the following characteristics:

- Wider pavement widths.
- Longer blocks.
- A "super-grid" pattern with local streets within the superblocks.
- Gently curving streets.
- Numerous cul-de-sacs.
- Rolled curbs with a much wider radius at corners.
- Infrequent or inadequate sidewalks.
- Little attention to non-motorized travel.

This street pattern fit well with land use patterns where single-family residential, apartments, employment and shopping uses were all segregated from each other in large, single-use districts connected with a near-expressway supergrid.

However, as car ownership, vehicle trips, and miles traveled have all increased, this development pattern has caused serious problems.



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Designing streets for everybody

Funneling large volumes of cars through a limited number of intersections is less efficient than dispersing those vehicles over a larger network with numerous intersections. The result can be seen in many post-World War II communities today – long delays and congestion on collector and arterial roadways.

Longer travel distances and few connections between destinations also mean that routine trips, like going to school or picking up a loaf of bread, require a vehicle trip, thus further compounding the problem.

This street pattern has a direct impact on emergency response. Congested streets and limited connections and access points can significantly increase response times. Wide, high-speed streets – particularly those in residential neighborhoods or near schools and shopping areas – also increase the risk of accidents with other vehicles and pedestrians.

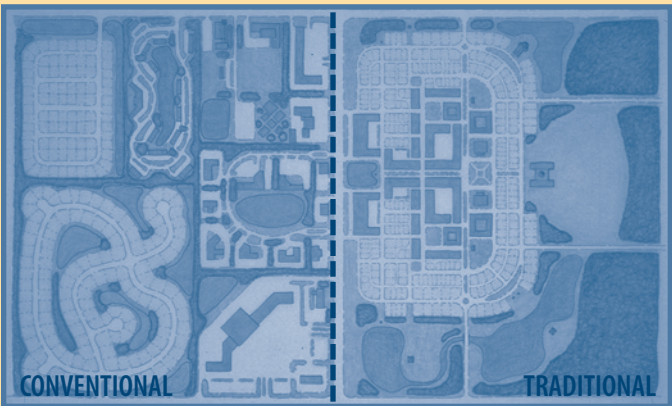


ever higher levels of traffic in a hierarchy that eventually dumps vehicles onto the regional supergrid of arterial streets. Any trip between destinations of different land uses – no matter how close they are to each other – must use these arterials.

By comparison, the traditional neighborhood designed with smart growth principles (on the right) contains a balanced mix of uses, so that many day-to-day travel needs of area residents can be met locally. These trips can be made on foot, but if a car is used require only a short drive inside the neighborhood, without impacting the arterial network.

Forcing all vehicle travel out onto the regional arterial network makes traffic congestion inevitable. This congestion – unnecessary in a smart growth community – means delays for all travel and a navigation nightmare for emergency responders.

Traffic calming measures can restore some balance to non-motorized travel, but it can be difficult to do so without affecting emergency response times. If designed properly, streets can meet the multiple needs of residents and cars, while also providing the environment that emergency responders require.



Two development and travel patterns

The left side of the illustration shows a conventional neighborhood, with each type of use – single-family, multi-family, office, commercial and public – segregated into single-use tracts. The street connections collect

How
Conventional
and
Smart Growth
Development
Approaches
Compare

	CONVENTIONAL DEVELOPMENT	SMART GROWTH DEVELOPMENT
Uses	Separated by type	Mixed throughout
Streets	Branched hierarchy feeding arterials Wide, with many dead-ends	Interconnected grid with short blocks Narrow, with multiple access routes
Alleys	None, except loading dock access	Almost everywhere, even residential
Curbs	Rolled curbs in all residential areas	Vertical curbs everywhere
Sidewalks	Attached to curb, if any at all	Universal, detached or very wide
People	Isolated in homes and cars	Interact on porches and sidewalks
Children	Must be chauffeured by parents	Safe to move independently in area
Walking	Between cars and buildings	To many daily destinations
Vehicles	All trips must use regional network	Daily needs met with short internal trips
Fire Trucks	Must navigate through congestion	Quicker response in less traffic

Changing Approach to Design

A sweeping change in approach is required when smart streets are designed. At the outset, it must be understood that the “street” is the entire space between buildings on opposing sides of the street, not just the curb-to-curb pavement section.

This larger space must be designed to meet parallel objectives that place safety and convenience for pedestrians and bicyclists on a par with motorized vehicle travel. The street must also provide parking, and be visually appealing.

The primary factor that determines the character of a particular street is its function in the neighborhood, not the volume of car traffic that a computer model predicts it must accommodate. This is a philosophical shift away from what has been standard practice in traffic engineering for the last few decades.



For example, if you want to create a “main street” type neighborhood commercial center, do not design the street for high volumes of traffic – no matter what the computer simulation says. Six lanes of fast, noisy cars will be hazardous to pedestrians, and destroy the quiet environment that encourages people to stroll around a neighborhood center.

A well-designed street in a neighborhood center should be two lanes – and never more than four – with curbside parking, generous sidewalks and design features that strictly limit vehicle speed. Simply put, it is a small-scale boulevard, not an expressway.

Providing bicycle lanes along all arterial streets is an important consideration, and can greatly benefit emergency response. The bike lane becomes available

for cars pulling to the right to clear the through lane for emergency vehicles. With curb-to-curb vehicle lanes, it is more difficult for cars to pull out of the way.

Slowing vehicle speeds is important, since the higher densities typical with smart growth mean there is so much



more non-vehicular activity on the streets. A driver in a conventional street environment “owns” the road, except for a few crosswalks at selected corners. The driver’s attention is focused only on his own actions and those of other drivers.

On a smart-growth street, the driver must slow down and be alert for:

- Pedestrians in crosswalks.
- Pedestrians crossing away from crosswalks.
- Bicyclists entering, crossing, and riding along the street.
- Cars entering and leaving curbside parking spaces.
- More frequent intersections and crosswalks.
- Curb bulbs, pedestrian refuges, and other safety features not in conventional streets.

The kinds of smart-growth design concepts described in this fact sheet will let the street engineer get it right initially, so that expensive, controversial and time-consuming traffic calming projects are not needed later to correct poor design.

FOR MORE INFORMATION

“Street Design Guidelines for Healthy Neighborhoods,” Dan Burden, Local Government Commission.

“Emergency Response, Traffic Calming and Traditional Neighborhood Streets,” Dan Burden and Paul Zykofsky.

“Traffic Calming and Emergency Response” fact sheet, Local Government Commission.



Who wins with good street design?

- **Emergency Responders** – who see less congestion, improved access and fewer barriers.
- **Residents** – who will enjoy a safer, quieter and more attractive public realm.
- **Store Owners** – with more shoppers and sales generated by increased pedestrian activity.
- **Property Owners** – who will see significant increases in property values.
- **Traffic Engineers** – who will be lauded for understanding current practices in street design.
- **Elected Officials** – who will be lauded for designing slower, safer, quieter streets.
- **Drivers** – whose trips will be safer and less stressful.
- **Pedestrians** – who will be healthier, and have the status on the street that they deserve.
- **Bicyclists** – who will benefit from dedicated bike facilities and an ethic of sharing street space.



Signs of smart growth streets

The simplest way to learn what smart-growth streets are like is to look at pre-World War II neighborhoods in any city in America. There you will see most of these characteristics:

- Distinction between streets for regional travel and local access.
- Reduced pavement widths, as narrow as 26 feet for two-way residential streets.
- Rectangular blocks, no longer than 500 or 600 feet, with pedestrian passages if longer.
- Alleys in most settings, residential and neighborhood commercial.
- Streets that favor straight lines, curving only when topography dictates.
- Termination points at prominent landmarks, such as a park, church, city hall or clock tower.
- Bike lanes or bike paths connecting key destinations and districts.
- Medians, generally raised and landscaped, on “main streets” and arterials.
- Sidewalks everywhere, with planting strips in residential areas, concrete to the curb in commercial areas.
- Heavy use of pedestrian-friendly devices like curb bulbs and pedestrian refuges.
- 6- to 8-inch vertical curbs.
- Curbside parking virtually everywhere.

Why emergency responders should care



Regional benefits:

Employed on a regional basis, smart growth land-use patterns and street design will reduce arterial congestion because more daily trips will be made internally in neighborhoods without venturing out onto the regional arterial network. This reduced

congestion benefits emergency responders because fire, police and ambulance vehicles will encounter fewer cars on primary response routes; and private vehicles will be able to use bike lanes to move out of the way.

Local advantages: Employed in select districts, smart growth land-use patterns and street design will improve fire, police and ambulance access because they are provided many different routes to an emergency scene. This reduces the need for excess pavement width to allow emergency vehicles to pass by vehicles that are already deployed at a scene. Those later arrivals can come down the street from the other direction, or go to the rear of the scene via the alley. Both of these approach strategies are impossible with conventional development that favors dead-end streets and lacks alleys.