4. STREET NETWORKS AND CLASSIFICATIONS

(Credit: Kimley-Horn and Associates, Inc.)

INTRODUCTION

This chapter describes the inter-relationship between the broader network of streets, how streets are classified, and how this affects the experience of the network user. Principles of complete streets are presented in the planning for urban street networks to create a well-connected grid that provides a high degree of route choices and transportation modal options. A well-connected grid network of streets is called a sustainable street network. The consideration of complete streets principles in the network and corridor planning processes contributes to the consideration of key issues and objectives.

The United States has a long and distinguished history of creating memorable and enduring cities, such as Savannah, Charleston, Washington, D.C., Boston, Santa Monica, and San Francisco. These cities are memorable and enduring partly because of their street networks. Well-planned street networks help create sustainable cities that support the environmental, social, and economic needs of their residents.

> *"There are no obstacles to getting around, if you have a car "*
> - *(Participant in Broward Complete Streets focus group with the elderly)*

The street network configuration affects three fundamental aspects of urban transportation.

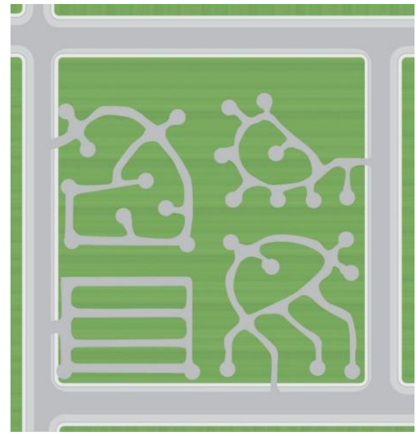
- Safety
- Transportation mode choice
- Emergency response

THE LINK TO SAFETY

- Sustainable street networks improve traffic safety.
  Over 30,000 Americans perish each year in traffic crashes (National Highway Traffic Safety Administration, Fatality Analysis Reporting System [FARS], 2009 data). Pedestrians account for a significantly higher percentage of fatalities than their typical mode share would indicate (4,092 pedestrians died in traffic crashes in 2009, which represented 12.1 percent of all traffic fatalities). Bicyclists (termed pedalcyclists in the FARS database) are also overrepresented (630 bicyclists died in traffic crashes in 2009, which represented 1.9 percent of all traffic fatalities). A good street network is a powerful tool for reducing traffic crashes and fatalities while creating beautiful places.

  Hierarchical street patterns (arterial-collector-local) with cul-de-sac subdivisions depending on arterials do not perform as well as sustainable street networks and cause more traffic crashes. Hierarchical street networks divert traffic to high-speed arterials that have large intersections. Most motor vehicle crashes occur at intersections. Even short, local trips must use arterials because there is not a supporting network of connected collectors and local streets. The speed at which motor vehicles move on these arterial streets increases the likelihood and severity of crashes.

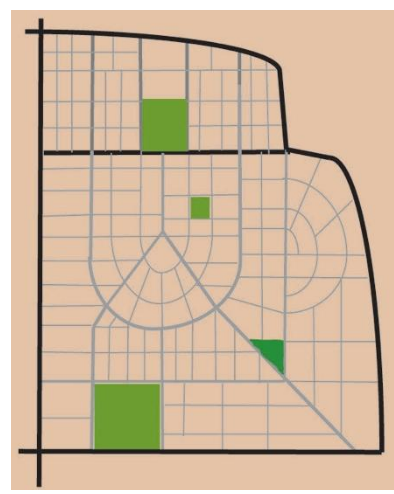
A 2011 study of 24 California cities found a 30 percent higher rate of severe injury and a 50 percent higher chance of dying in cities dominated by sparsely connected cul-de-sacs compared with cities with dense, connected street networks (Marshall, W. and Garrick, N., "Does the Street Network Design Affect Traffic Safety?" *Accident Analysis and Prevention* 43[3]: 769-781). A 2009 study from Texas found that each mile of arterial is associated with a 10 percent increase in multiple-vehicle crashes, a 9.2 percent increase in pedestrian crashes, and a 6.6 percent increase in bicyclist crashes (Dumbaugh, E. and Rae, R., "Safe Urban Form: Revisiting the Relationship between Community Design and Traffic Safety," *Journal of the American Planning Association* 75[3]:309-329).



Cul-de-sac developments break up connectivity and create longer trips (Credit: Michele Weisbart)

THE LINK TO TRANSPORTATION MODE CHOICE

- Sustainable street networks increase the number of people walking, bicycling, and taking transit, which help reduce vehicle miles traveled.
  Connectivity enables people to take shorter routes. It also enables them to travel on quieter streets. These shorter routes on quiet streets are more conducive to bicycling and walking. The California study cited above found that places with a dense, connected street network had three to four times more people walking, bicycling, or using transit to get to work. This in turn led to a 50 percent reduction in vehicle miles traveled per capita in these cities (Marshall, W. and Garrick, N., "*The Spatial Distribution of VMT Based upon Street Network Characteristics*," 90th Meeting of the Transportation Research Board, Washington, D.C., January 2011).



Interconnected street network with small blocks (Credit: Marty Bruinsma)

THE LINK TO EMERGENCY RESPONSE

- Sustainable street networks allow more effective emergency response.
  Two primary reasons why sustainable grid street networks work better for emergency response are (1) maximizing the number of addresses served from each station and (2) providing a redundancy of routes. Studies in Charlotte, North Carolina, found that when one connection was added between cul-de-sac subdivisions, the local fire station increased the number of addresses served by 17 percent and increased the number of

households served by 12 percent. Moreover, the connection helped avoid future costs by slowing the growth of operating and capital costs; most of the cost to run a fire station is in salaries. Furthermore, the Congress for the New Urbanism's (CNU) report on emergency response and street design found that emergency responders favor well-connected networks with a redundancy of routes to maximize access to emergencies. Emergency responders can get stuck in culs-de-sac and need options when streets back up ("*Effect on Connectivity on Fire Station Service Area and Capital Facilities*," 2009 presentation by the Charlotte, North Carolina Department of Transportation, http://charmeck.org/city/charlotte/citymanager/CommunicationstoCouncil/2009Communications/Documents/CNUPresentationcolor.pdf).

In addition to transportation benefits, broader Smart Growth goals such as economic activity and healthy communities are supported by sustainable grid street networks.

The Link To Economic Activity

- A sustainable and resilient street network fosters economic and social activity.
  While the number of lanes on each street are limited, maximum travel options (routes) are enhanced by sustainable street networks because collectively, more lanes are provided on more streets with better connectivity. By providing opportunities for all modes of travel, an ideal street network enhances social equity and provides an ideal setting for high quality design at all scales: building, neighborhood, and region. The resulting communities can be some of the most beautiful places with the highest values in the world.

  An excellent local example of this principle is the Las Olas area of Fort Lauderdale. Las Olas was developed in the 1920s when communities were still developed around a grid street network. Local real estate studies consistently find that the Las Olas area enjoys the most resilient and sustainable values in Broward County. Commercial lease rates in Las Olas remain at a premium and Las Olas has surpassed Broward Boulevard as the premier address for office users ("*Year End 2011 Broward Office Report*," Commercial Florida Realty Services, LLC). According to this report, new office space is not likely to be developed in the central business district for the forseeable future; however, planned development of multi-family residential could actually spur more activity resulting in even higher demand for office space. This demonstrates the positive impact of mixed-use areas.

  Affordable housing also benefits from a sustainable grid street network. Affordable housing developments are often located in older neighborhoods with at least a partial grid street network in place. This allows residents to take advantage of the transportation benefits offered by shorter walks to work or public transportation, and being able to bicycle on connected local streets and collectors, rather than arterial boulevards. In addition, a recent report from the Center for Real Estate at the Massachusetts Institute of Technology (MIT) debunks the notion that affordable housing developments depress the values of nearby single-family dwellings. Using data from 36,000 property sales between 1982 and 2003, the researchers found that home value changes over time in the areas near affordable housing developments simply "tracked" those in nearby market areas with no affordable housing options (Pollakowski, H., Ritchay, D., and Weinrobe, Z., "*Effects of Mixed-Income, Multi-Family Housing Developments on Single-Family Housing Values,*" April 2005).

THE LINK TO HEALTHY COMMUNITIES

- A sustainable and resilient street network enhances active transportation and community vitality.

  The health benefits of a traditional grid street network, which enhances connectivity and active transportation options, are numerous. Street network designs impact the likelihood residents will engage in walking, bicycling, or wheeling (physical activity) as a mode of active transportation. Active transportation can reduce the risk of diseases impacted by sedentary lifestyles, including Type 2 Diabetes, heart disease, high blood pressure, stroke, dementia, breast and colon cancer, as well as those related to poor air quality such as impaired lung development, lung cancer, and asthma, among others (Buchman, A. S., et al., "Total Daily Physical Activity and the Risk of AD and Cognitive Decline in Older Adults*," Neurology*, 2012, 78: 1323-1329; Lee, C. D., Folsom, A. R., and Blair, S. N., "Physical Activity and Stroke Risk: A Meta-Analysis," *Stroke: Journal of the American Heart Association*, September 18, 2003, 34: 2475-2482, available at http://stroke.ahajournals.org/content/34/10/2475.full.pdf; Bell, J. and Cohen, L., *The Transportation Prescription: How Transportation Policies and Plans Influence Health*, PolicyLink and Prevention Institute, 2009, available at http://www.policylink.org; Frank, L. D., Andresen, M. A., and Schmid, T. L., "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars," *American Journal of Preventive Medicine*, 2004, 27[2]: 87-96; Slattery, M. L., et al., "Energy Balance and Colon Cancer — Beyond Physical Activity," *Cancer Research*, January 1, 1997, 57[1]: 75-80; and U.S. Department of Health and Human Services, *Physical Activity and Health: A Report of the Surgeon General,* 1999, available at http://www.cdc.gov/nccdphp/sgr/index.htm).

  Residents living along a sustainable street network are more likely to have higher levels of social capital (know their neighbors, participate politically, trust others, and be socially engaged) than those residing along car-oriented suburbs (Leyden, K. M., "Social Capital and the Built Environment: The Importance of Walkable Neighborhoods," *American Journal of Public Health*, September 2003, 93[9]: 1546-1551). These are vital components contributing to mental health and well-being of the community, as well as the opportunity for residents to age in place (Cagney, K. and Wen, M., *Social Capital and Health: Part II Chapter 11. Social Capital and Aging-Related Outcomes,* 2008, 239-258). Additional benefits of such cohesion produced by gridded street networks include more eyes on the street, which provides support, safety, and reduction in violence (Cohen, L. et al., *Addressing the Intersection: Preventing Violence and Promoting Healthy Eating and Active Living*, Prevention Institute, 2010, available at www.preventioninstitute.org).

Disparities in affordable transportation access can also be addressed by a sustainable street network (TransForm in collaboration with the California Department of Public Health, *Creating Healthy Regional Transportation Plans: A Primer for California's Public Health Community on Regional Transportation Plans and Sustainable Communities Strategies,* 2012, available at www.transformca.org). Broward County residents expressed they would actively commute rather than use a car if they had better connectivity and felt safe walking, bicycling, or wheeling throughout their community (Urban Health Partnerships, Inc., *Broward Complete Streets Initiative Community Engagement Report*, 2012).

Solutions that have the broadest impact may be found at the network scale rather than at individual street segments. The design of the network establishes the role of, and design parameters for, individual street or corridor designs.

The studies cited above and others provide strong evidence that the benefits of a well-designed street network go beyond safety; they include health, environmental, social, and economic gains. Sustainable street networks shape land use markets and support compact development, in turn decreasing the costs of travel and providing utilities. Street networks like these are resilient over hundreds of years and accommodate changing technology, lifestyles, and travel patterns. Interconnected street networks can preserve habitat and important ecological areas by condensing development, reducing city edges, and reducing sprawl.

ESSENTIAL PRINCIPLES OF SUSTAINABLE STREET NETWORKS

Sustainable street networks come in many shapes and forms, but have the following overarching principles in common.

- The sustainable street network both shapes and responds to the natural and built environment.
- The sustainable street network privileges trips by foot, bike, and public transit because these are the most sustainable types of trips.
- The sustainable street network is built to walking dimensions.
- The sustainable street network works in harmony with various transportation systems, such as pedestrian, bicycle, transit, and private vehicle. Large parts of all of these networks are coincidental with the street network, but if any parts are separate from the street network, they must connect and interact with the network.
- The sustainable street network protects, respects, and enhances a city's natural features and ecological systems.
- The sustainable street network maximizes social and economic activity.
- The sustainable street network provides the option to age in place and affordably access daily activities and goods.

APPROACH

Sustainable street networks should provide for the following outcomes.

- Sustainable street networks should provide a high level of connectivity so that motorists, pedestrians, bicyclists, and transit riders can choose the most direct routes and access urban destinations.
- Intersperse arterial thoroughfares with a system of intermediate collector thoroughfares serving local trips connecting neighborhood destinations.
- Build network capacity and redundancy through a dense, connected network of small streets rather than through an emphasis on super-wide arterial facilities with high capacity.
- Expand the typical definition of collectors to recognize their role in connecting local origins and destinations rather than just connecting local streets to arterial boulevards.
- Multimodal street network planning should be integrated into long-range transportation plans, comprehensive plans, and land use plans.

CONNECTIVITY INDEX

A Connectivity Index can be used to quantify how well a street network connects destinations. Indices can be measured separately for motorized and non-motorized travel. Several methods can be used according to the Victoria Transport Policy Institute (VTPI) at www.vtpi.org.

- The number of roadway links divided by the number of roadway nodes or intersections (Ewing, 1996). A higher index means that travelers have increased route choice, allowing more direct connections for access between two locations.
- The ratio of intersections divided by the sum of intersections and deadends, expressed on a scale from zero to one (U.S. Environmental Protection Agency, 2002). The closer the index is to 1.0, the more connected the street network.
- The number of surface street intersections within a given geographic area, such as a square mile (intersection density). The more intersections, the greater the degree of connectivity.
- An Accessibility Index as the ratio of direct travel distances to actual travel distances. Well-connected streets result in a high index. Less connected streets with large blocks result in a lower index.
- The Walking Permeability Distance Index (WPDI) deals specifically with an accessibility index for walking trips. (Allan 2001; Soltani and Allan 2005). It aggregates walkability factors such as street connectivity, street width, and sidewalk quality.

STREET CHARACTERISTICS AND CLASSIFICATIONS

A sustainable street network provides a pattern of multimodal streets that serves all community land uses and facilitates easy access to local, city, and regional destinations. The pattern, which should give priority to non-motorized modes, results in distribution of traffic that is consistent with the desired function of the street. One characteristic of this pattern is that it offers many route choices that connect origins with their destinations.

The street network works best when it provides a variety of street types. The variety is enforced by the pattern of the street network itself but also by the design of individual street segments. Natural and built features, including topography and important community destinations, should be taken into account to create unique designs.

In new subdivisions, integrating a network of shared use paths and earthen trails into the street network should be considered. Under this concept, every fourth or fifth "street" provides quiet, comfortable access for bicyclists, pedestrians, joggers, skaters, wheel chair users, and others along a linear parkway without motor vehicles. Where these intersect streets, they should be treated as intersections with appropriate treatments. This type of network would allow people to circulate in their new communities to schools, parks, stores, and offices while staying primarily on dedicated paths and trails. These networks can also link to paths and trails along waterways, utility corridors, rail rights-of-way, and other more common active transportation corridors. The adjacent diagram illustrates this concept.

Integrating bicycle and pedestrian paths into new development (Credit: Michele Weisbart)

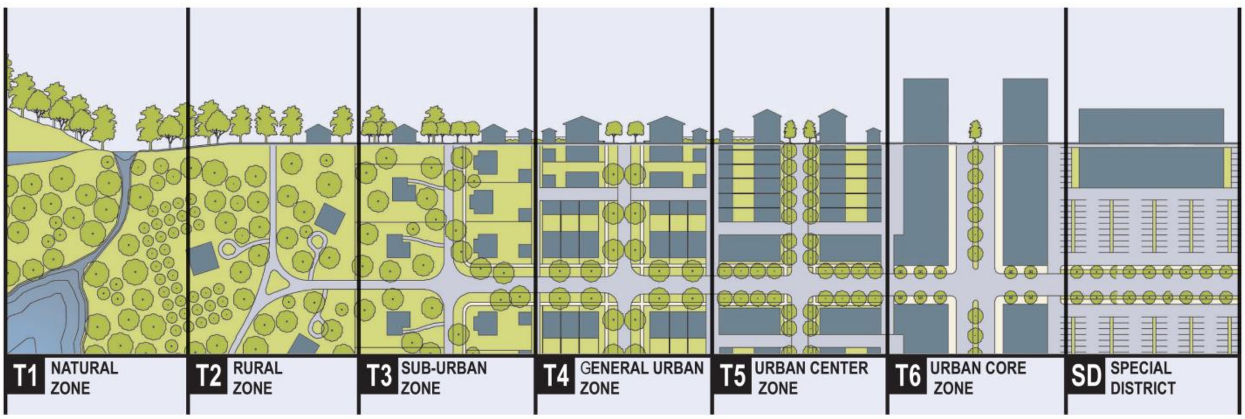
The types of streets used in the network are described in the design standards below (see number 13). The types differ in terms of their network continuity, cross-section design, and adjoining land use. The individual streets themselves will change in character depending on their immediate land use context.


Multi-family development in Coconut Creek with a shared-use path connecting to Tradewinds Park (Credit: Kimley-Horn and Associates, Inc.)

CONTEXT: THE TRANSECT

Context is the environment in which the street is built and includes the placement and frontage of buildings, adjacent land uses and open space, and historic, cultural, and other characteristics that form the built and natural environments of a given place. The transect is a recognized tool for defining the context and assists designers in creating an appropriate design for the context. Andres Duany of Duany, Plater, Zyberk & Company developed the transect.

The transect zones range from T1 (Natural) to T6 (Urban Core). In the least-intensive T-Zones of a community, T1 and T2, a rural road or highway is appropriate.



The transect zones (Credit: Duany, Plater, Zyberk & Company)

By definition, the urban T-Zones T3 through T6 do not exist as "stand alone" zones, but rather are organized in relationship to each other within a community. Each T-Zone is highly walkable and assumes the pedestrian mode as a viable and often preferred travel mode, especially for the ¼ mile, five-minute walk.

The T3 suburban zone defines the urban to rural edge. Of all the T-Zones, T3 appears most like conventional sprawl. It has single-family dwellings, a limited mix of uses and housing types, and tends to be more automobile-oriented than T4, T5, or T6. The five-minute test of walkable distance (¼ mile radius) limits the overall size of a T3 transect zone. The T3 zone often defines the edge of the more developed urban condition, so is sometimes called the "neighborhood edge."

For example, knowing that a particular area is a T5, Town Center, defines the context for the built environment including the street design criteria and elements, such as the width of sidewalks, the presence of on-street parking, and the use of tree wells instead of planting strips. Buildings built to the sidewalk with parking on the street and behind, for instance, are appropriate in T5 and T6. Referring to a set of tables and design recommendations correlated to the transect helps the designer determine how a street should function in each T-Zone.

Contexts will not always flow evenly and incrementally from T1 to T6: there may be gaps. For example, T2 jumps to T5 may occur, or a rural community may have only T2 with a community center that is not urban enough to be T5 (for example, a church, convenience store, antique store, and gas station at the one intersection in the whole town).

An important element of the design process is to ensure the travelled way design fits the context of the intended design. Through use of a regulating plan, the appropriate street design will be established to fit the context, purpose, and type of street.

DESIGN STANDARDS

1. Establish a block size maximum of 1,320 linear feet (perimeter).
   - Ensure greater accessibility within the block through alleys, service courts, and other access ways.
   - Where block size is exceeded, retrofit large blocks with new street, alleys, pedestrian and/or bicycle connections.
   - For existing street networks, do not allow street closures that would result in larger blocks.

2. The basic form of the street network system is shaped by the spacing and alignment of the major thoroughfares (continuous boulevards and avenues). Major continuous thoroughfares should be spaced as follows based on context zone.
   - Dense urban centers (T5 and T6)
     - Thoroughfares @ 1,320 feet
   - General urban centers (T4)
     - Thoroughfares @ 2,640 feet
   - Conventional suburban areas
     - Thoroughfares @ 5,280 feet

3. Require multiple street connections between neighborhoods and districts across the whole region. This is achieved by having boulevards and avenues that extend beyond the local area. Adjacent neighborhoods must also be connected by multiple local streets.

4. Connect streets across urban freeways so that pedestrians and bicyclists have links to neighborhoods without having to use streets with freeway on and off ramps.

5. Maintain network quality by accepting growth and the concomitant expansion of the street network (including development, revitalization, intensification, or redevelopment) while avoiding increases in street width or in number of lanes

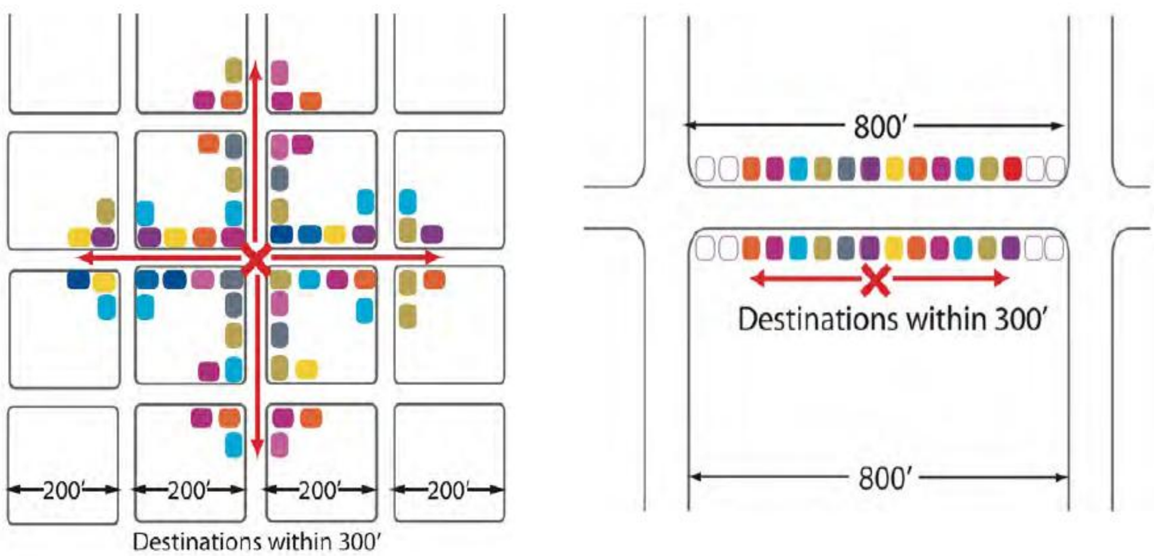
6. Provide on-street curbside parking on most streets. Exceptions can be made for very narrow streets, streets with bus lanes, or where there is a better use of the space.

7. Establish maximum speeds of 20 to 35 mph.
    - Use design features that support lower-speed environments including tight corner radii, travel lanes of 10 to 11 feet in width, robust landscaping, roundabouts, and frequent marked pedestrian crosswalks.
    - On local streets, the speed should be 20 to 25 mph or less.

8. Maintain network function by discouraging the following poor connectivity features.
    - One-way streets
    - Turn prohibitions
    - Full or partial closures (except on bike boulevards, or areas taken over for other uses of public space)
    - Removal of on-street parking (except when replaced by wider sidewalks, an enhanced streetscape, bus lanes, bike lanes, etc. rather than additional vehicle lanes)
    - Gated streets
    - Widening of individual streets
    - Conversion of city streets to limited access facilities

9. Include a system of bicycle facilities with parallel routes no more than one-half mile apart.

10. Pedestrian facilities should be defined by block lengths and should be located on both sides of streets.



Many more destinations can be reached walking 300' within a network of short blocks than in one with long blocks (Credit: Marty Bruinsma)

11. Local streets should be configured in a fine-grained multimodal network internal to neighborhoods.

12. Pedestrian shortcuts should be provided in locations where the network is broken.

13. Classify major streets using the common street and context types presented in Table 4.1. However, some streets are unique and deserve a special category that lies outside the common street network types. Table 4.2 describes these special streets. Chapter 5, "Traveled Way Design," contains guidance related to cross sections of these street typologies. New street types should be welcomed as well.

Types and Roles of Streets

The Federal Highway Administration (FHWA) Functional Classification Guidelines contain the conventional classification system that is commonly accepted to define the function and operational requirements for streets. These classifications are also used as the primary basis for geometric design criteria.

Traffic volume, trip characteristics, speed and level of service, and other factors in the functional classification system relate to the mobility of motor vehicles, not bicyclists or pedestrians, and do not consider the context or land use of the surrounding environment. This approach, while appropriate for high speed rural and some suburban roadways, does not provide designers with guidance on how to design for complete streets or in a context-sensitive manner.

While the conventional functional classification system characterizes roadways by vehicular functions, the street types presented in Tables 4.1 and 4.2, and described on the following pages, consider broader roles and functions of urban streets. The street types described here provide mobility for all modes of transportation with a greater focus on the pedestrian. The functional classification system can be generally applied to the street types in this document. Designers should recognize the need for greater flexibility in applying design criteria, based more heavily on context and the need to create a safe environment for pedestrians, rather than strictly following the conventional application of functional classification in determining geometric criteria.

The terms for street types for complete streets are described in the following sections. Many local governments in Broward County use the terms "avenue" and "street" in combination with the street name as a way to differentiate streets running north and south from those running east and west (e.g., 1st Street, 1st Avenue); these uses differ from the definitions used in this manual.

<u>Boulevard</u>

A boulevard is a walkable, divided arterial street designed for high vehicular capacity and moderate speed, traversing an urbanized area. Boulevards serve as primary transit routes and should have bike lanes. Boulevards serve as primary goods movement and emergency response routes and typically use vehicular and pedestrian access management techniques. Boulevards may be equipped with bus lanes or side access lanes (multiway boulevards) buffering sidewalks and buildings. Many boulevards also have landscaped medians. Boulevards are similar to arterials in the conventional street functional classification system.

Boulevard example: Hillsboro Boulevard
(Credit: City of Deerfield Beach)

Boulevard example: Las Olas Boulevard
(Credit: Luisa Fernanda Arbeláez)

<u>Avenue</u>

An avenue is a walkable street of moderate to high vehicular capacity and low to moderate speed acting as a short distance connector between urban centers and serving as access to abutting land. Avenues may be equipped with a landscaped median or a two-way left-turn lane median (common after road diet conversions). Avenues serve as primary pedestrian and bicycle routes and may serve local transit routes. Avenues may serve commercial sectors or a mix of commercial and residential uses. Avenues are similar to urban minor arterials or urban collectors in the conventional street classification system.

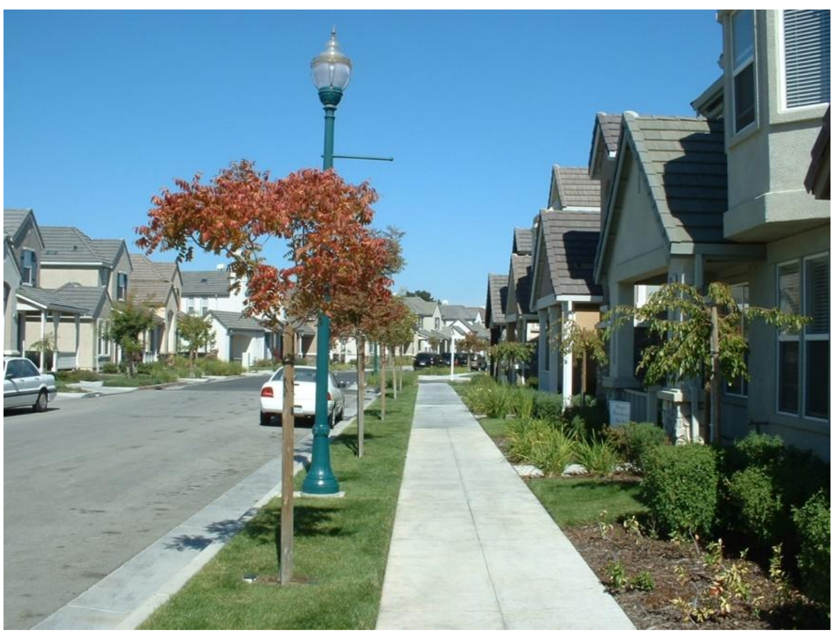
Avenue example (Credit: City of Charlotte, NC)

Avenue example (Credit: Kimley-Horn and Associates, Inc.)

Street

A street is a local, walkable, multi-movement facility suitable for all urbanized transect zones and all frontages and uses. Speeds should be no higher than 25 mph. Commercial and mixed-use streets are urban in character, with raised curbs (except where curbless treatments such as festival streets are designed), small corner radii, wide sidewalks, parallel parking, and trees in individual or continuous planters. Residential streets typically have curbs in the T5 and T6 transects, but can be either curbed or curbless in other transects. The primary purpose is to serve abutting property and local traffic.

Street example (commercial): Sanford, FL (Credit: Billy Hattaway)



Street example (residential) (Credit: Kimley-Horn and Associates, Inc.)

Alley/Lane

An alley or lane is a narrow street, often without sidewalks, where vehicles travel at walking speeds. Alleys and lanes connect streets and provide access to the back of buildings or garages.

Alley example (residential): Chapel Hill, NC (Credit: Ryan Snyder)

Alley example (commercial): Boca Raton, FL (Credit: Kimley-Horn and Associates, Inc.)

Table 4.1 provides a list of common street types. The special street typologies listed in Table 4.2 have particular functions within the street network. Photos of special street types follow Table 4.2.

Table 4.1 Common Street Types

Street Type	Description	Comment
Boulevard* (conventionally called arterials)	Walkable, moderate speed divided arterial in urban environments that traverses and connects districts and cities. Primarily a longer distance route for all vehicles including transit, goods movement, and emergency response. Design speeds should be 35 mph or less.	Serves as primary transit routes. Should have bike lanes and sidewalks standard. May have shared-use paths. Often has a planted median. May have on-street parking when passing through urban centers and urban cores.
Avenue* (conventionally called collectors or urban minor arterials)	Walkable, low speed collector or minor arterial that serves as a short-distance connector between districts or urban centers and provides access to abutting land. Links streets with boulevards. For all vehicles including transit. Design speeds should be 30 mph or less; strong consideration should be given for 25 mph or less when on-street parking is provided.	Serves as primary pedestrian and bicycle routes. Should have local transit routes. May or may not have a median. May or may not have on-street parking depending on context.
Street* (conventionally called local streets)	Walkable, low speed facility that primarily serves as access to abutting properties and local traffic in neighborhoods. Connects to adjoining neighborhoods. Serves local function for vehicles and transit. Design speeds should not exceed 25 mph.	Can be commercial or residential. Bicycles are served by shared space. Commercial streets should always have sidewalks. Residential streets should have sidewalks unless traffic volumes are less than 1,200 per day and speeds are 25 MPH or less.
Alley/Lane	Walkable link between streets; allows access to garages.	Narrow space characterized by walking speeds.
*May have segments with specialized functions and features such as a Main Street segment.		

Table 4.2 Special Street Types

Special Street Type	Description	Comment
Main Street	Slower vehicle speeds, favors pedestrians most, contains the highest level of streetscape features, typically dominated by retail and other commercial uses	Functions differently than other streets in that it is a destination
Drive	Located between an urbanized neighborhood and park or waterway	Can be a local street or an alley
Transit Mall	The traveled way is for exclusive use by buses or trains, typically dominated by retail and other commercial uses	Excellent pedestrian access to and along the transit mall is critical. Bicycle access may be supported.
Bike Boulevard	A continuous through street for bicycles, but short distance travel (local access) for motor vehicles	Usually a local street with low traffic volumes and low speeds
Festival Street	Contains traffic calming, flush curbs, sidewalks separated by bollards, and streetscape features that allow for easy conversion to public uses such as farmers' markets and music events	Often a commercial street in a downtown context that has the special design features listed to the left
Shared Space	Slow, curbless street where pedestrians, motor vehicles, and bicyclists share space	May support café seating, play areas, and other uses

ADDITIONAL RESOURCES

Institute of Transportation Engineers. *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, 2010.

Institute of Transportation Engineers. *Planning Urban Roadway Systems: An ITE Proposed Recommended Practice*, 2011.

Zhou, N. and Smith, P. "Estimated VMT and GHG Emission Reductions Associated with the Going to the River Project," *Institute of Transportation Engineers (ITE) Journal*, 2012, 82[5]: 42-47.

Main Street example with street café
(Credit: Kimley-Horn and Associates, Inc.)

Drive example near Victoria Park
(Credit: Kimley-Horn and Associates, Inc.)

16th Street Transit Mall: Denver, CO
(Credit: Ryan Snyder)

Bicycle boulevard with bike box intersection
(Credit: Toole Design Group)

Festival street with flush sidewalks separated by bollards
(Credit: Kimley-Horn and Associates, Inc.)

Shared space: Copenhagen, Denmark
(Credit: Ryan Snyder)