About the Guide

Over the coming century, the challenges borne by cities and the burdens placed upon their streets will multiply in quantity and complexity. Growing urban populations will demand that their streets serve not only as corridors for the conveyance of people, goods, and services, but as front yards, parks, playgrounds, and public spaces. Streets must accommodate an ever-expanding set of needs. They must be safe, sustainable, resilient, multi-modal, and economically beneficial, all while accommodating traffic.

In response to these unprecedented demands, cities around the country are developing an innovative body of practice and expertise to design for and around the special characteristics of the urban environment. From New York's Times Square to Chicago's Wacker Drive to Spring Street in Los Angeles, a better approach to and understanding of street design is taking root in our cities.

Street Design Principles

The *Urban Street Design Guide* crystallizes a new approach to street design that meets the demands of today and the challenges of tomorrow. Based on the principle that streets are public spaces for people as well as arteries for traffic and transportation, the Guide foregrounds the role of the street as a catalyst for urban transformation. It cements the tactics and techniques being pioneered by the nation's foremost urban engineers and designers.

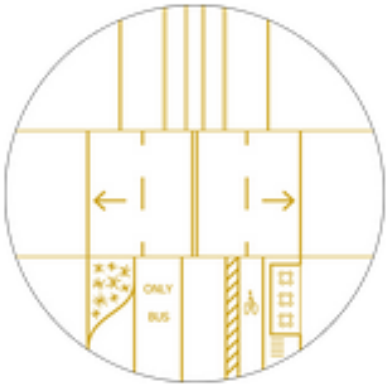
In an urban context, street design must meet the needs of people walking, driving, cycling, and taking transit, all in a constrained space. The best street design also adds to the value of businesses, offices, and schools located along the roadway.

Streets Are Public Spaces

Streets are often the most vital yet underutilized public spaces in cities. In addition to providing space for travel, streets play a big role in the public life of cities and communities and should be designed as public spaces as well as channels for movement.

Great Streets are Great for Businesses

Cities have realized that streets are an economic asset as much as a functional element. Well-designed streets generate higher revenues for businesses and higher values for homeowners.[1]



Streets Can Be Changed

Transportation engineers can work flexibly within the building envelope of a street. This includes moving curbs, changing alignments, daylighting corners, and redirecting traffic where necessary. Many city streets were built or altered in a different era and need to be reconfigured to meet new needs. Street space can also be reused for different purposes, such as parklets, bike share, and traffic calming.

Design for Safety

In 2012 in the U.S., over 34,000 people were killed in traffic crashes, which were also the leading cause of death among children aged 5–14. These deaths and hundreds of thousands of injuries are avoidable. Traffic engineers can and should do better, by designing streets where people walking, parking, shopping, bicycling, working, and driving can cross paths safely.

Streets Are Ecosystems

Streets should be designed as ecosystems where man-made systems interface with natural systems. From pervious pavements and bioswales that manage storm- water run-off to street trees that provide shade and are critical to the health of cities, ecology has the potential to act as a driver for long- term, sustainable design.

Act Now!

Implementing projects quickly and using low-cost materials helps inform public decision making. Cities across the U.S. have begun using a phased approach to major redesigns, where interim materials are used in the short term and later replaced by permanent materials once funding is available and the public has tested the design thoroughly.

Lane widths of 10 feet are appropriate in urban areas and have a positive impact on a street's safety without impacting traffic operations.

DISCUSSION

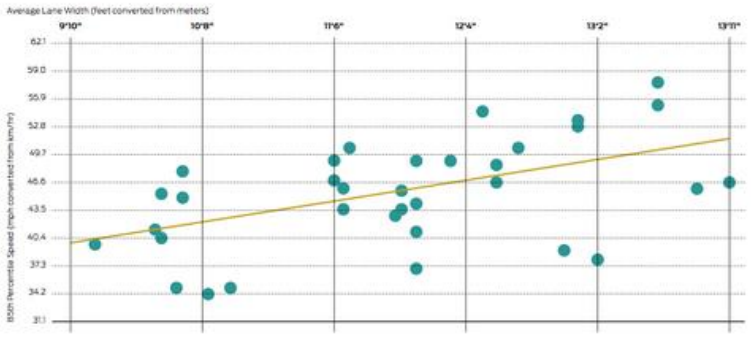
Travel lanes are striped to define the intended path of travel for vehicles along a corridor. Historically, wider travel lanes (11–13 feet) have been favored to create a more forgiving buffer to drivers, especially in high-speed environments where narrow lanes may feel uncomfortable or increase potential for side-swipe collisions.

Lane widths less than 12 feet have also historically been assumed to decrease traffic flow and capacity, a claim new research refutes.[1]

+ More Info

The relationships between lane widths and vehicle speed is complicated by many factors, including time of day, the amount of traffic present, and even the age of the driver. Narrower streets help promote slower driving speeds which, in turn, reduce the severity of crashes. Narrower streets have other benefits as well, including reduced crossing distances, shorter signal cycles, less stormwater, and less construction material to build.

Wider travel lanes are correlated with higher vehicle speeds.



"As the width of the lane increased, the speed on the roadway increased... When lane widths are 1 m (3.3 ft) greater, speeds are predicted to be 15 km/h (9.4 mph) faster."

Chart source: Fitzpatrick, Kay, Paul Carlson, Marcus Brewer, and Mark Wooldridge. 2000. "Design Factors That Affect Driver Speed on Suburban Streets." *Transportation Research Record* 1751: 18–25.

Wider travel lanes are correlated with higher vehicle speeds.

For multi-lane roadways where transit or freight vehicles are present and require a wider travel lane, the wider lane should be the outside lane (curbside or next to parking). Inside lanes should continue to be designed at the minimum possible width. Major truck or transit routes through urban areas may require the use of wider lane widths.

Lane widths of 10 feet are appropriate in urban areas and have a positive impact on a street's safety without impacting traffic operations. For designated truck or transit routes, one travel lane of 11 feet may be used in each direction. In select cases, narrower travel lanes (9–9.5 feet) can be effective as through lanes in conjunction with a turn lane.[2]

Design Speed

Speed plays a critical role in crashes and the severity of their outcomes. Traditional street design was grounded in highway design principles that forgive driver error and accommodate higher speeds. This approach based the design speed and posted speed limit on 85th percentile speeds —how fast drivers are actually driving—rather than how fast drivers ought to drive. By designing for a faster set of drivers, crashes increase and drivers actually traveling the speed limit are put at risk.

This passive use of design speed accommodates, and indirectly encourages, speeding by designing streets that account for the worst set of drivers and highest potential risks. Higher design speeds, moreover, degrade city streets and walkable neighborhoods by mandating larger curb radii, wider travel lanes, guardrails, streets with no on-street parking, and generous clear zones.

- Speed Reduction Mechanisms

DISCUSSION

Lowering injuries and fatalities remains a crucial goal for our cities. In 2011, 4,432 pedestrians were killed and 69,000 injured in motor vehicle crashes, according to the National Highway Traffic Safety Administration (NHTSA). Of the fatalities, 73% occurred in urban areas. This equates to 146 people killed or injured in cities everyday.

To counteract these gruesome and unnecessary injuries and fatalities, cities should utilize speed control mechanisms that influence behavior, lower speeds, and in turn, reduce injuries and fatalities. Embracing a proactive design approach on new and existing streets with the goal of reducing speeds "may be the single most consequential intervention in reducing pedestrian injury and fatality."[1]

Speed plays a critical role in the cause and severity of crashes. There is a direct correlation between higher speeds, crash risk, and the severity of injuries.[3]

SPEED (MPH)	STOPPING DISTANCE (FT)*	CRASH RISK (%)†	FATALITY RISK (%)†
10–15	25	5	2
20–25	40	15	5
30–35	75	55	45
40+	118	90	85

* Stopping Distance includes perception, reaction, and braking times.
† Source: Traditional Neighborhood Development: Street Design Guidelines (1999), ITE Transportation Planning Council Committee 5P-8.

Driving Speed Fatality Risk Chart
Click to enlarge

On city streets, designers should select a design speed to use in geometric decisions based on safe operating speeds in a complex environment.

Higher design speeds often mandate larger curb radii, wider travel lane widths, on-street parking restrictions, guardrails, and clear zones. Lower design speeds reduce observed speeding behavior, providing a safer place for people to walk, park, and drive.

Conventional Highway Design:

Operating Speed = Design Speed = Posted Speed

Proactive Urban Street Design:

Target Speed = Design Speed = Posted Speed

Mass differential between street users results in more severe injuries to the lighter of the two colliding bodies.

Bus
24,000 lbs

Car
2,000 lbs

Cyclist/ Pedestrian
30–250 lbs