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## Purpose

The *Street Design Manual* is New York City's comprehensive resource on street design guidelines, policies, and processes. It aggregates a broad range of resources — from nationally recognized engineering and design guidelines and standards to federal, state, and local laws, rules, and regulations — to provide information on treatments that are allowed and encouraged on New York City streets. The Manual's intended audience is diverse, consisting of design professionals, city agencies and officials, community groups, and private developers.

The *Street Design Manual* supplements rather than replaces existing engineering and environmental standards, requirements, or guidelines, such as the *Manual on Uniform Traffic Control Devices* (MUTCD), *AASHTO Policy on Geometric Design of Highways and Streets* ("Green Book"), and ADA Standards for Accessible Design. In a city with as many varied and complex conditions as New York, designs must be tailored to the particular needs and opportunities created by the local context, uses, and dimensions of streets. The *Street Design Manual* leaves ample room for choice, and all designs remain subject to case-by-case DOT approval based on established engineering standards and professional judgment, with the safety of all street users being of paramount importance.



ABOVE: Fulton Street, Brooklyn

LEFT: 6 ½ Avenue and West 51st Street, Manhattan

This Manual is New York City's comprehensive resource on street design guidelines, policies, and processes.



Until the early 20th century, streets served as the front yards and public squares of cities.

## Background

Until the early twentieth century, streets served not only as transportation routes but as the front yards and public squares of cities. Horse-drawn carriages, people on foot or horseback, and, later, bicycles and streetcars shared streets with pushcart vendors, outdoor markets, children playing, and neighbors socializing. City streets were vibrant, though plagued by safety, sanitation, and mobility problems.

As Peter Norton explains in his book *Fighting Traffic: The Dawn of the Motor Age in the American City*, when motor vehicles were introduced into this mix, they were not accounted for by the laws, engineering and design practices, and public mores of the time. Pedestrian deaths and injuries from motor vehicle crashes were so frequent that the press across the

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Over the last 15 years, best practices have increasingly favored street designs that support walking, bicycling, and public transit use.

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country routinely vilified motorists, and citizens regularly staged parades commemorating the dead. Some municipalities even contemplated requiring speed controls on engines.

As early as the 1910s, automobile-owners' associations and engineers' groups launched public relations and legislative campaigns to address both the negative public sentiment and the alarming safety problems. They succeeded in getting new laws and

LEFT: Lower East Side, Manhattan (1910)

RIGHT: Ninth Avenue, Manhattan



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engineering standards to improve safety; as a byproduct, motor vehicles were given greater standing in the roadway. By 1930, cultural norms had adjusted to this paradigm shift. Cities prioritized automobile movement for most of the twentieth century. But planners, designers, and engineers have come to recognize that this focus has led to an alarming number of crashes resulting in deaths and serious injuries; unsustainable land-development patterns; a reduction of the number of transportation choices; increased noise, pollution, and greenhouse gases; and a decline in social, civic, physical, and economic activity on streets.

Over the last 15 years, best practices have increasingly sought to address these issues by favoring street designs that

support walking, bicycling, public transit, and universal access, as well as motor vehicle use. Practitioners (and the public) have also learned that street infrastructure can yield benefits well beyond mobility: enhanced public health, more pleasant environments, and increased economic activity.

This Manual builds on current thinking about street design, materials, lighting, and project implementation around the world to promote a great public realm. It advocates high-quality, sustainable design and encourages greater mode choice. Also, its creation led to the streamlining of DOT's internal design-review processes, which has made project execution more efficient.

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**Practitioners (and the public) have learned that investment in high-quality street infrastructure can yield benefits well beyond mobility.**

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# Street Design Policy

Planning and designing streets in accordance with the goals and principles of this section will contribute to a consistent level of quality and functionality for New York City's streets. Along with the project's planning framework, they should be used to resolve conflicting priorities for limited street space.

## Goals & Principles

Streets, which take up over a quarter of the city’s land area, are a critical part of New York City’s infrastructure. The condition of these public spaces has a significant impact on the city’s environmental health and on the quality of life for its residents.

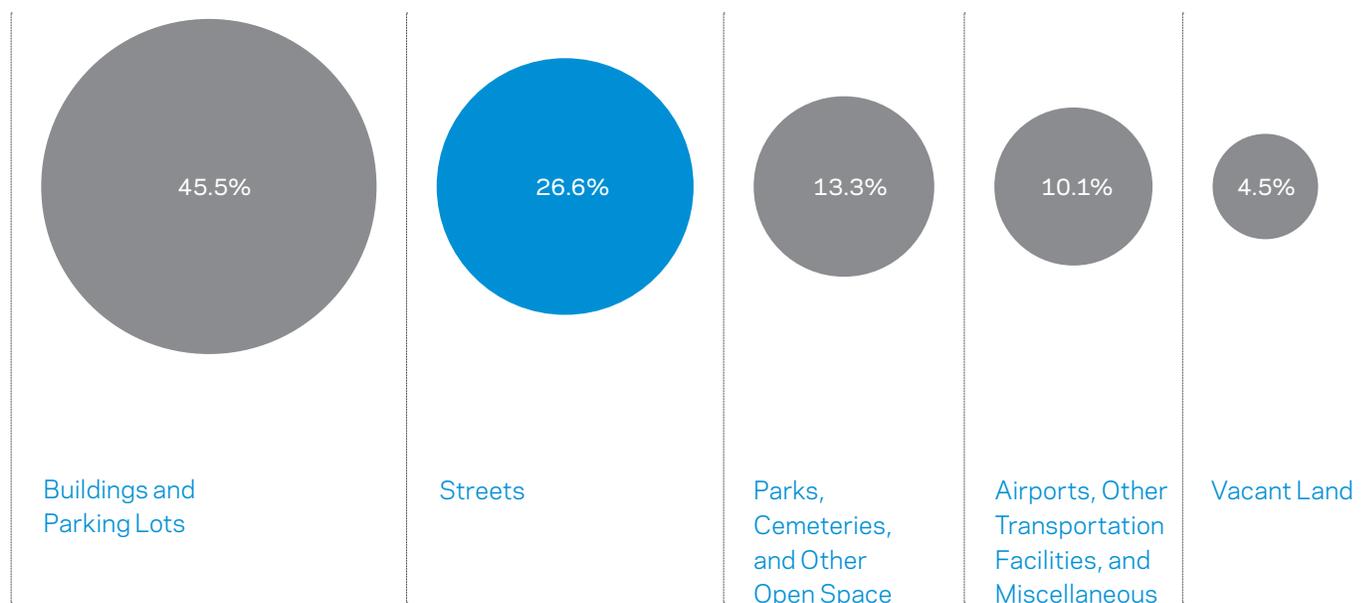
DOT’s overall goals and principles are:

- 1 **Design for Safety**
- 2 **Design to Balance Local Access and Mobility**
- 3 **Design for Context**
- 4 **Design Streets as Public Spaces**
- 5 **Design for Sustainability and Resiliency**
- 6 **Design for Cost-Effectiveness**

Accordingly, it is the policy of DOT that practitioners adhere to the following goals and principles when designing city streets, all with an eye to achieving maximum inclusivity and the highest possible aesthetic standards.

### Percent of New York City Land Area by Use

Streets make up over a quarter of the city’s land area. (Source: PlaNYC Sustainable Stormwater Management Plan, 2008)





Operational safety enhancements: Seventh Avenue, Manhattan



Balance of local considerations with through traffic: Delancey Street, Manhattan



Street design to match the context: Eastern Parkway, Brooklyn

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### Design for Safety

The city's efforts to enhance street safety through engineering, education, and enforcement have contributed to a dramatic drop in the number of pedestrian fatalities and serious injuries in the past 10 years. Designing safe streets will continue to be the first priority for DOT.

- o **Prioritize safety for all street** users, particularly more vulnerable groups (children, the elderly, those with disabilities) and more vulnerable modes (walking, bicycling).
- o **Design local streets for slower** speeds to reduce the number of crashes and to discourage cut-through traffic.
- o **Research, test, and evaluate** innovative safety treatments, particularly those successfully adopted in other cities.

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### Design to Balance Local Access and Mobility

Street designs should provide efficient ways to move people and goods and improve the economic vitality of the city, but not at the expense of safety and community needs; street designs should therefore balance access within neighborhoods with mobility through them.

- o **Provide safe, accessible,** convenient, and comfortable facilities for walking, bicycling, and transit, particularly on designated routes and at critical network connections.
- o **Accommodate truck traffic and** deliveries while minimizing their negative impacts on neighborhoods.
- o **Meet or exceed ADA Standards** for Accessible Design and Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG).
- o **Accommodate emergency-**vehicle access.

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### Design for Context

Streets help define the character of neighborhoods. Except for standard furniture, materials, and lighting, a street's design should interact with the surrounding context, including its history, land uses, and nearby landmarks.

- o **Preserve the unique character of** neighborhoods.
- o **Support connections to adjacent** land uses by providing gathering spaces and pedestrian access to and from major destinations.
- o **Maintain aesthetic consistency** within neighborhoods and corridors.



Streetscape enhancements: Columbus Avenue, Manhattan



Bioswale: Dean Street, Brooklyn



Raised median: Grand Concourse, Bronx

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### Design Streets as Public Spaces

Beyond their use for moving people and goods, streets comprise an extensive network of public open spaces that can facilitate social, civic, and economic interactions.

- **Expand usable public open space** by reallocating underutilized roadway space for pedestrian plazas, expanded sidewalks, corner and mid-block curb extensions, and opportunities for green planted areas.
- **Design streets to encourage physical activity** for all ages and populations by making walking, bicycling, and transit attractive and convenient.
- **Design local streets to be traffic-calmed environments** that encourage walking, bicycling, and recreational activities.
- **Expand the availability of public seating and bicycle racks.**

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### Design for Sustainability and Resiliency

Streets present an extraordinary opportunity to improve the environmental health of the city. Collaborate across agencies in testing, evaluating, and standardizing new materials so that streets are constructed in an environmentally sound way, and respond effectively to more frequent intense storms and catastrophic weather events.

- **Minimize impermeable surfaces** and maximize vegetation on streets. Street designs should use stormwater source controls wherever possible.
- **Utilize resilient materials that** can withstand periodic temporary inundation by both fresh and salt water.
- **Reduce streets' rate of heat absorption** by maximizing tree canopy cover.
- **Minimize the overall lifecycle** energy use and pollution associated with projects, including the extraction, transportation, construction, maintenance, and replacement of materials.

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### Design for Cost-Effectiveness

Reconstruction of city streets requires substantial financial resources. The list of worthy projects competing for a limited pool of funding is extensive. Street designs need to be cost-effective.

- **Consider not only up-front capital costs, but also full lifecycle costs and benefits;** certain options may cost more up front, but may have lower ongoing maintenance and operations costs and/or provide long-term benefits.
- **Design streets to meet the city's future needs.** Because streets are reconstructed infrequently, consideration of future conditions and needs should be part of the planning process.
- **Maintain a clear and consistent design-review process** to streamline project review.
- **Establish well-considered and clearly defined goals early in project development and focus on meeting those goals throughout planning and design.**

# Applicability

The policies and guidelines in the *Street Design Manual* are the foundation of designs for all projects that significantly impact public and private streets in New York City. It should be used by agency staff, design professionals, community groups, and other entities involved in the planning and design of streets. DOT will review projects for consistency with the Manual.

Examples of applicable projects include Capital and Expense projects, such as street reconstructions and resurfacings; operational and traffic control treatments; street work associated with new or renovated buildings; and other public or private construction projects that include roadways, sidewalks, and plazas.

The guidance presented in the *Street Design Manual* does not supersede any existing federal, state or city laws, rules, and regulations. All projects remain subject to relevant statutes, such as the Zoning Resolution of the City of New York, City Environmental Quality Review (CEQR), and appropriate reviews and approvals of oversight agencies such as the Public Design Commission (PDC), Landmarks Preservation Commission (LPC), and Office of Management and Budget (OMB).

The Manual provides assistance in four areas:



Tillotson Avenue Step Street, Bronx (Credit: DDC)

## Organization

The *Street Design Manual* is structured with six chapters and two appendices. Chapters 2 through 6 contain the bulk of the Manual's design guidance.



Fourth Avenue community workshop: Brooklyn



Operational safety enhancement: Louis Nine Boulevard, Bronx



Concrete pigmented to match adjacent bluestone: Pacific Street, Brooklyn

### Chapter 1: Process

How DOT projects are conceived, planned, designed, and implemented.

### Chapter 2: Geometry

A "toolbox" of geometric street treatments to enhance safety, mobility, and sustainability.

### Chapter 3: Materials

Specific materials with recommendations for use and references to appropriate specifications.



Cobra Head luminaire on Octagonal pole: Pearl Street, Manhattan



CityBenches: Court Street, Brooklyn



Planted median: 253rd Street, Queens

### Chapter 4: Lighting

Street and pedestrian lights that meet energy efficiency, technical, and visual quality criteria.

### Chapter 5: Furniture

Standard outdoor furniture, including DOT's coordinated street furniture franchise.

### Chapter 6: Landscape

General guidelines on plant selection, design, installation, and maintenance for typical applications in the public right-of-way (ROW).

### Glossary

Definitions of frequently used terms and abbreviations.

### Appendix B: Legal & Design Guidance References

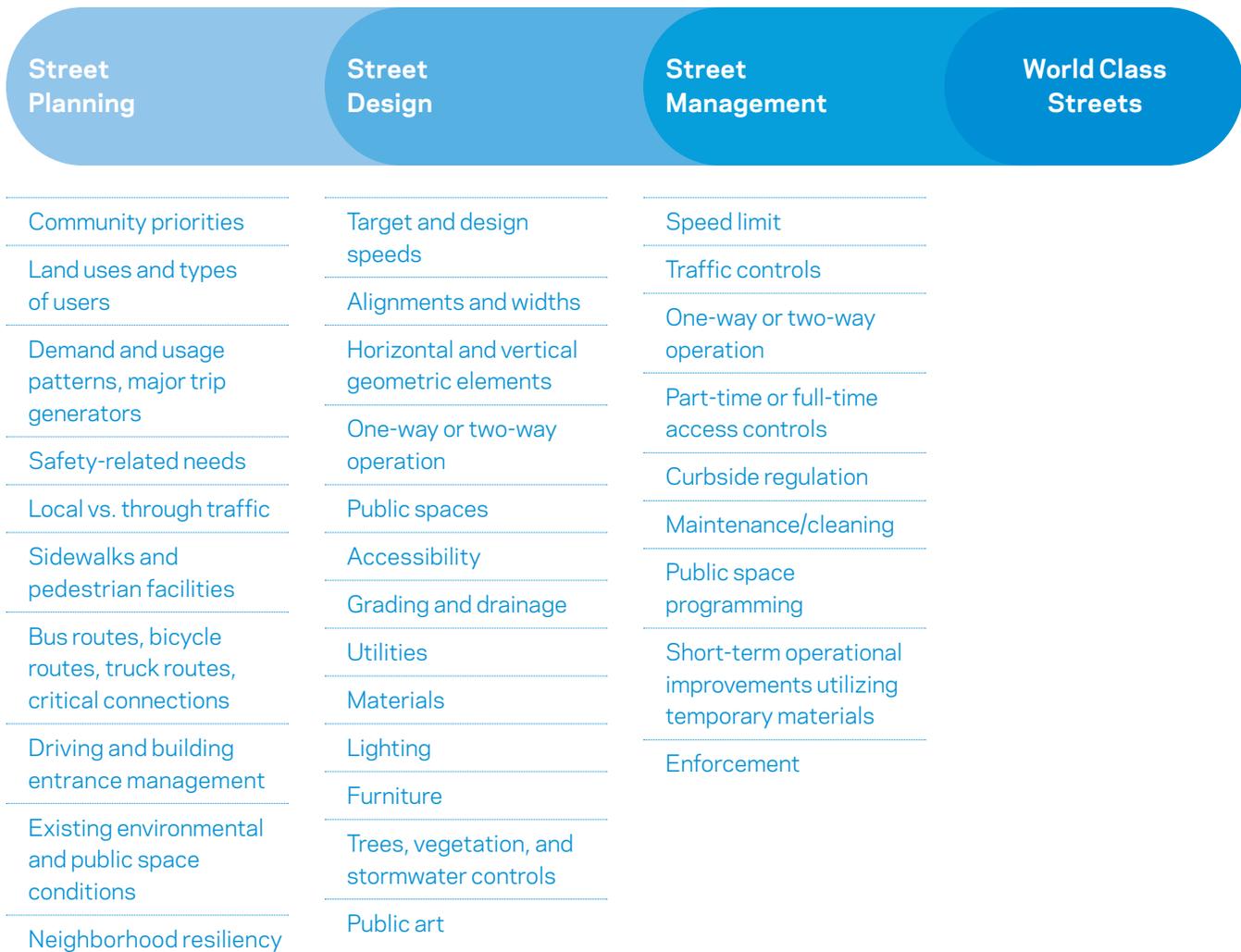
Reference to laws, regulations, and reference sources.

### Appendix A: Agency Roles on the City's Streets

Agency responsibilities for particular street operations and infrastructure.

# The Planning Framework

The *Street Design Manual* is focused on providing guidance for the design of streets. But the planning framework that establishes the context and priorities for each design, and the ongoing management and operation of streets once built, are also critical steps to create world-class streets (see below). DOT evaluates the costs and effectiveness of design treatments and management strategies to inform future designs and initiatives. This section provides an overview of the larger planning framework for street design. Appendix B includes a number of useful resources for best planning practices for streets.





At the first public workshop for a plaza, participants share their ideas for the space: Ozone Park, Queens

### Planning

Every street is inseparable from its surrounding community and land uses, and also a part of the larger transportation network of the city and region. Streets should be designed with an understanding of their role in both the local and larger planning contexts. The planning of street projects should begin with the setting of clearly defined goals. Projects should seek to address not only pre-existing issues that have been identified by the community or the city, but also policy objectives or other needs of the city and stakeholders. Appropriate stakeholders should be involved in projects from conception to implementation.

### Design

The *Street Design Manual's* design guidance includes options for geometric, material, lighting, furnishing, and landscape treatments (Chapters 2-6); in most cases it does not prescribe which specific treatments must be used and in which combination. It also does not dictate which treatment should receive priority when there is a conflict between design alternatives. Rather, it gives users the flexibility to determine which overall design is most appropriate and practical in light of the goals and priorities established through the planning process and the policies enumerated in this Manual. The Design Considerations list in the next section can be a particularly helpful tool for this decision-making process.

### Management

Well-functioning, high-quality streets are not just a product of their planning and design — the way a street is operated and managed once built is just as important as its design. For example, curbside regulations and traffic controls (signs, signals, and markings) are a central factor in determining how streets operate and the quality of the public realm. Likewise, access to a street can be limited to pedestrian traffic on certain days or for certain hours, and vehicular traffic can be limited to transit and/or commercial vehicles some or all of the time. Finally, maintenance of street materials, furnishings, and plantings is critical to the long-term success of street designs.

# Design Considerations

To define context, set project goals, and help give appropriate thought to the full range of factors that should inform a street's design, refer to this list of design considerations. Projects submitted to DOT for approval will be reviewed with respect to these topic areas.

## Street Context

### History & Character

Details for the specific project area

### Land Use

Predominant land uses and densities within the project area (e.g., light residential, dense commercial), any historic districts or special zoning districts, proximity to transit

### Network Role

Role of the street in the neighborhood, city, and regional transportation system

### Trip Generators

Trip generators within or proximate to the project area, including prominent landmarks, commercial, cultural and civic institutions, public spaces, and facilities serving people with disabilities

### Street Width

Available space and how its allocation will be prioritized

## Street Operations

### Pedestrians

Pedestrian safety, volumes, comfort and convenience of movement, access or mobility needs of people with disabilities, the elderly, and children, ADA compliance, crash history, important walking connections, and quality of the walking environment

### Bicycles

Bicycle safety, volumes, comfort and convenience of movement, existing or proposed bike routes and other important bicycling connections, crash history, and bicycle parking

### Motor Vehicles

Motor vehicle safety, volumes, access, crash history, important motor vehicle connections, appropriateness of motor vehicle traffic to street scale (e.g., local vs. through traffic), and ways to reduce the negative impacts of motor vehicle traffic

### Transit

Safety, bus routes and operations, subway or other transit station access, and transit usability

### Trucks/Freight

Safety, truck routes, volumes, access, mobility, and ways to reduce the negative impacts of truck traffic

### Curbside Conditions

Curbside demand and usage patterns within the project area, allocation of space for through movement, meter parking, non-metered parking, loading, deliveries, pedestrian space, and sightlines

### Public Space

Opportunities for making streets within the project area better public spaces through such measures as traffic calming, pedestrian seating, appropriate lighting, and art

### Street Cuts

Frequency of needed access requiring utility "cuts" into the roadway within the project area, and potential improvement or consolidation of utility infrastructure

## Community Goals

Factors various community stakeholders express as important to their health, quality of life, and community character

## Greening

### Street Trees

Canopy coverage within the project area

### Vegetation

Existing plantings within the project area and opportunity sites for other planted areas

### Maintenance Partner(s)

Potential and/or committed maintenance partners (e.g., BIDs, DPR) and level of commitment (e.g., watering, weeding, pruning, litter removal, replacements)

## Resiliency

### Stormwater Control

Stormwater runoff conditions, permeability of underlying soil, stormwater source controls, and durability of infrastructure in recovering from water and saltwater exposure

### Drainage

Stormwater flow patterns, groundwater infiltration, catch basins, sewer connections, and waterbody impacts

### Flooding

Flooding conditions within the project area, coastal storm surge barriers

### Permits

Wetlands or coastline areas within 100 feet of the project area; requirements for New York State Department of Environmental Conservation or the Army Corps of Engineers permits

## Public Art

Opportunities for temporary and permanent art installations