



# Measuring the Street:

## New Metrics for 21st Century Streets

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New York City's streets are constantly called on to meet new and varied needs of a growing, dynamic, 21st Century city - and to do this in a complex environment where there is little opportunity to expand the existing footprint. How do city leaders address these challenges and measure their success? This report discusses key approaches to street design projects, and how results can be measured against goals for safety, serving all users and creating great public spaces while also maintaining the flow of traffic. Using a cross-section of recent NYCDOT street design projects, this report details the metrics NYCDOT uses to evaluate street projects, and illustrates how measuring results can show progress toward safe, sustainable, livable and economically competitive streets.

### Goals

Design for **safety**

Design for **all users of the street**

Design **great public spaces**

### Strategies

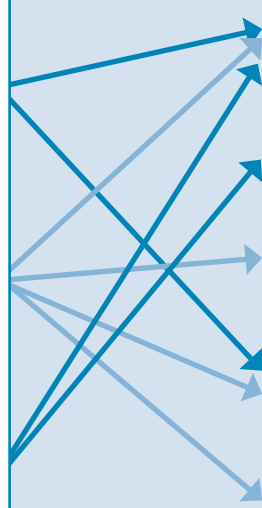
**Designing safer streets**, to provide safe and attractive options for all street users .....

**Building great public spaces** to create economic value and neighborhood vitality .....

**Improving bus service** to bring rapid transit beyond the subway .....

**Reducing delay and speeding** to allow for faster, safer travel .....

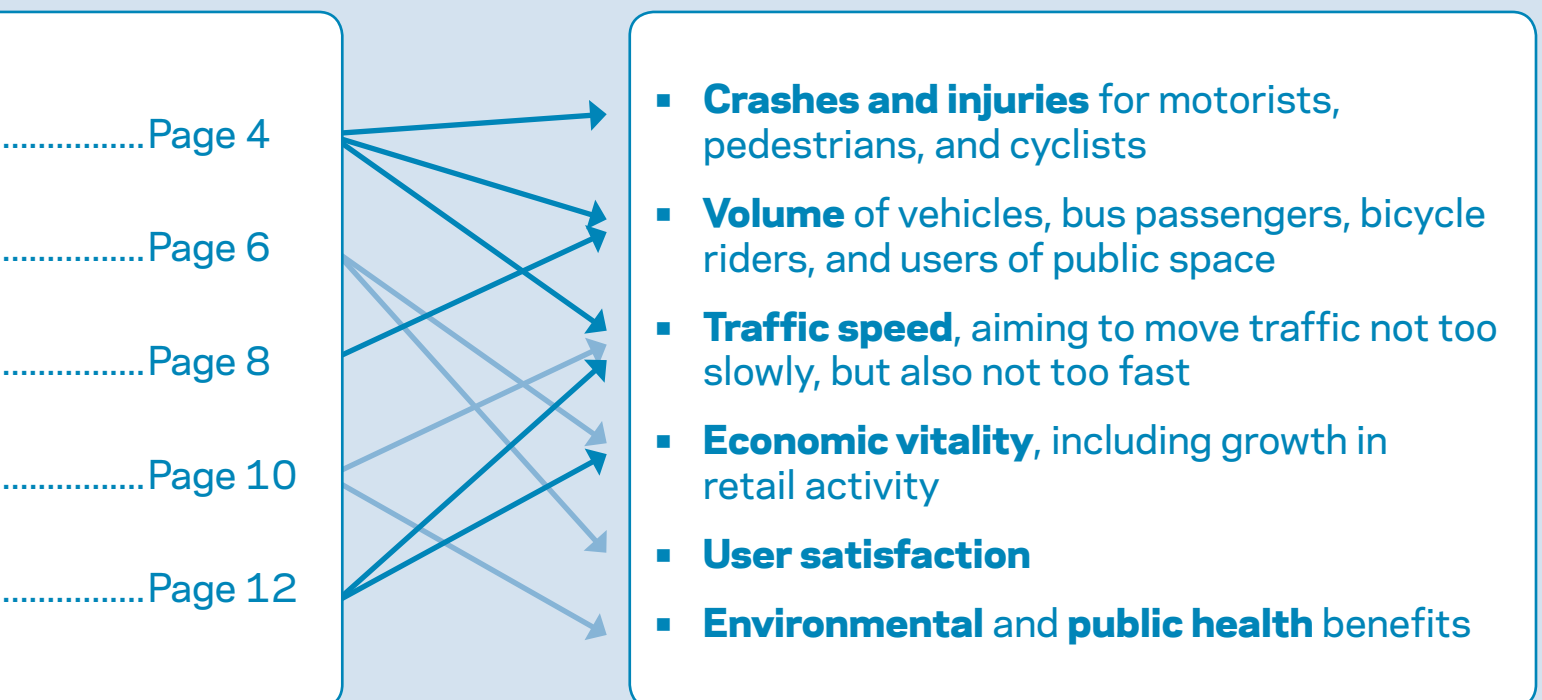
**Efficiency in parking and loading** to improve access to businesses and .....



Cities need to set new goals for their streets if they are to meet the needs of a dynamic and growing city and address the problems of vehicle crashes, traffic congestion, poor-performing bus and bike networks, and environments that are inhospitable for pedestrians. New York has been able to transform our streets by blending new technologies with time-tested tools to create 21st Century Streets for all users.

The projects described in this report demonstrate this approach. The metrics shown here track the success of these projects, inform the design of future projects and are vital to building public support for world-class streets.

## Metrics



# Designing safer streets

Safe and attractive options for all users

First protected bicycle lane in the US:  
8th and 9th Avenues (Manhattan)

**35%** decrease in  
injuries to all street  
users (8th Ave)

**58%** decrease in  
injuries to all street  
users (9th Ave)

Up to **49%**  
increase in retail  
sales (Locally-based  
businesses on 9th Ave from  
23rd to 31st Sts., compared  
to 3% borough-wide)



Left turn bays  
and signal  
phases

Mixing zones for  
bicycles and left-  
turning vehicles

Parking-protected  
bike lane

Pedestrian safety  
islands

The City's streets are unique because of the mix of people using the same space. Planning for safety, which is at the heart of every DOT initiative, means helping pedestrians, motorists, bus riders, and cyclists coexist safely. Here our focus has been on organizing the different streams of traffic - by simplifying intersections; by creating dedicated lanes for turning drivers and for cyclists; and by setting aside signal time and safe space for crossing pedestrians.

## KEY METRICS

- Crashes and injuries to motorists and other vehicle occupants, pedestrians, cyclists, and motorcyclists
- Vehicle speeds

### Neighborhood traffic calming: East 180th Street (Bronx)

**67%** decrease in pedestrian crashes

**29%** decrease in eastbound speeding

**32%** decrease in westbound speeding



# Building great public spaces

## Economic value and neighborhood vitality

Expanding an iconic space:  
Union Square North (Manhattan)

Speeding decreased by **16%**, while median speeds increased by **14%**

Injury crashes fell by **26%**

**49%** fewer commercial vacancies (compared to 5% more borough-wide)

**74%** of users prefer the new configuration



New York's streets serve more functions than simply moving people and goods. In such a densely populated city, the streets and sidewalks are places to congregate, relax, and enjoy being out in public. We have focused on creating great public spaces that serve individuals and groups large and small. Local organizations who maintain and program our public spaces help us ensure that these spaces will remain functional and useful for all users.

## KEY METRICS

- Economic vitality (sales tax receipts, commercial vacancies, number of visitors)
- User satisfaction, revealed through surveys
- Number of users

### Transforming an underused parking area: Pearl Street (Brooklyn)

**172% increase** in retail sales (at locally-based businesses, compared to 18% borough-wide)

BID held **27** public events in 2012

Maintenance partner agreement

Pedestrian plaza

### Creating a seating area out of curb lane: Pearl Street (Manhattan)

**77% increase** in seated pedestrians

**14% increase** in sales at fronting businesses

Striping and planters

Seasonal seating platform in curbside lane

# Improving bus service

## Rapid transit beyond the subway

Making bus routes work better:  
Fordham Road (Bronx)

**20%** increase in  
bus speeds

**10%** increase in  
bus ridership

**71%** increase in  
retail sales  
(at locally-based  
businesses, compared to  
23% borough-wide)

**Delivery windows**  
(curb dedicated to  
trucks at key times)

Transit signal  
priority

Curbside red  
bus lanes



Even though most New Yorkers use mass transit every day, the city's buses are the slowest in North America. In partnership with MTA New York City Transit, DOT has introduced a new level of bus service, Select Bus Service (SBS), to some of the city's busiest corridors. SBS includes off-board fare payment, three-door boarding to reduce boarding time; red bus lanes and Transit Signal Priority (TSP) to keep buses moving; and new shelters, buses, and bus bulbs to improve the passenger experience. SBS projects also include features to enhance pedestrian, cyclist, and traffic flow and safety.

## KEY METRICS

- Bus ridership
- Bus travel speeds
- Economic vitality (sales tax receipts, commercial vacancies, number of visitors)

### Dedicated lanes for both buses and bikes: First and Second Avenues (Manhattan)

**18%** increase in bus speeds

**12%** increase in bus ridership

Up to **177%** increase in bicycle volumes

**47%** fewer commercial vacancies  
(compared to 2% more borough-wide)

**37%** decrease in injury crashes



Separated left turn lanes and dedicated signal phases

Offset red bus lanes

Protected green bike lanes

Pedestrian refuges

# Reducing delay and speeding

## Faster, safer travel

Creative traffic engineering for wide streets:  
Hoyt Avenue at the RFK Bridge (Queens)

**51%** improvement  
in northbound  
travel times

**21%** decrease in  
crashes

**37%** increase in  
weekend bicycle  
volumes

New signals and  
modified timings

Pedestrian refuges  
and crosswalks

Banned turns  
during peak  
hours.

Bicycle lanes

Streets that work for traffic have less congestion and more reliable travel times. Improving traffic flow need not come at the expense of safety, however. Organizing traffic, simplifying complicated intersections, and optimizing signals can reduce peak congestion, but also prevent speeding at other times. We have combined roadway markings, geometric changes, and signal timing to manage traffic safely - reducing congestion but also controlling excessive speeds.

## KEY METRICS

- Travel speeds and times
- Traffic volumes
- Crashes and injuries to motorists and other vehicle occupants, pedestrians, cyclists, and motorcyclists

### Using technology to manage a congested business district: 42nd to 60th Street (Manhattan)

**10%** increase in travel speeds

**9%** decrease in Greenhouse Gas emissions in peak hours

Off-the-shelf technology (microwave traffic sensors, E-ZPass readers) to measure congestion levels

6th Ave

57th St

2nd

42nd St

New turn lanes

Advanced traffic signals with remote communications

Engineers can adjust signal timings on the fly in response to real-time traffic congestion.

# Efficiency in parking and loading

Improving access to businesses and neighborhoods

Improving parking for local businesses:  
Park Slope (Brooklyn)

**20%** decrease  
in average parking  
duration

**18%** more unique  
visitors found  
parking

**7%** reduction in  
traffic volumes *(less  
cruising for parking)*

**Raised parking  
rates during peak  
demand periods**

**Installed muni  
meters areawide**



Curb frontage is a scarce resource in New York. At the curb, drivers need to park, buses and taxis need to drop-off and pickup passengers, truckers need to load and unload freight, all without interfering with safe pedestrian, bicycle, and traffic flow. When curbs are congested, streets become congested. When curb space is available, the street works better for all users. We have used parking regulations and pricing (through our PARK Smart and commercial paid parking programs) to reduce the amount of time vehicles park, stand, or stop at the curb, so that space turns over for new users, and double parking is minimized. Reducing parking duration by 10-20% can have the same effect as creating hundreds of new parking spaces in a neighborhood, while improving traffic flow.

## KEY METRICS

- Vehicle travel speeds and volumes
- Double parking
- Parking duration
- Number of unique visitors

### Reducing double parking on a busy truck route: Church Avenue (Brooklyn)

**21%** increase in  
travel speeds at  
peak hours

**19%** increase  
in reliability of  
travel speeds

Outreach to  
inform truckers  
of new rules

Exclusive truck use  
of certain meters  
early in the morning

# Street redesign inventory

## 1. DESIGNING SAFER STREETS

### Key treatments

- Simplified intersections
- Dedicated left, right, and through lanes
- Pedestrian safety islands
- Protected bike lanes
- Leading pedestrian intervals and split phasing

### Also helpful

- Turn bans
- Mixing zones for bicycles and left-turning vehicles
- Medians
- Wide parking lanes
- Speed humps and slow zones

## 2. BUILDING GREAT PUBLIC SPACES

### Key treatments

- Create new pedestrian plazas – first using temporary materials, later as capital projects
- Street furniture
- Seasonal seating platform in curbside lane
- Striping and planters
- Maintenance agreements with local organizations
- Programmed events

### Also helpful

- Simplified intersections

## 3. IMPROVING BUS SERVICE

### Key treatments

- Offset bus lanes
- Transit Signal Priority
- Bus bulbs
- Bus lane enforcement cameras

### Also helpful

- Pedestrian safety islands
- Turn lanes and turn bans
- Delivery windows

## 4. REDUCING DELAY AND SPEEDING

### Key treatments

- Adaptive signal control
- Signal optimization
- Dedicated left, right, and through lanes
- Simplified intersections
- Neighborhood Slow Zones

### Also helpful

- Protected bicycle lanes
- Pedestrian safety islands
- Wide parking lanes

## 5. EFFICIENCY IN PARKING AND LOADING

### Key treatments

- PARK Smart
- Commercial Paid Parking
- Delivery Windows
- Muni meters

### Also helpful

- Offset bus lanes



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