



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

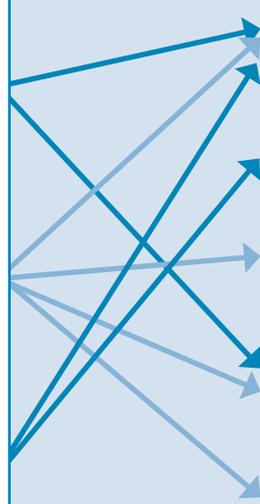
Designing safer streets, to provide safe and attractive options for all street users

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

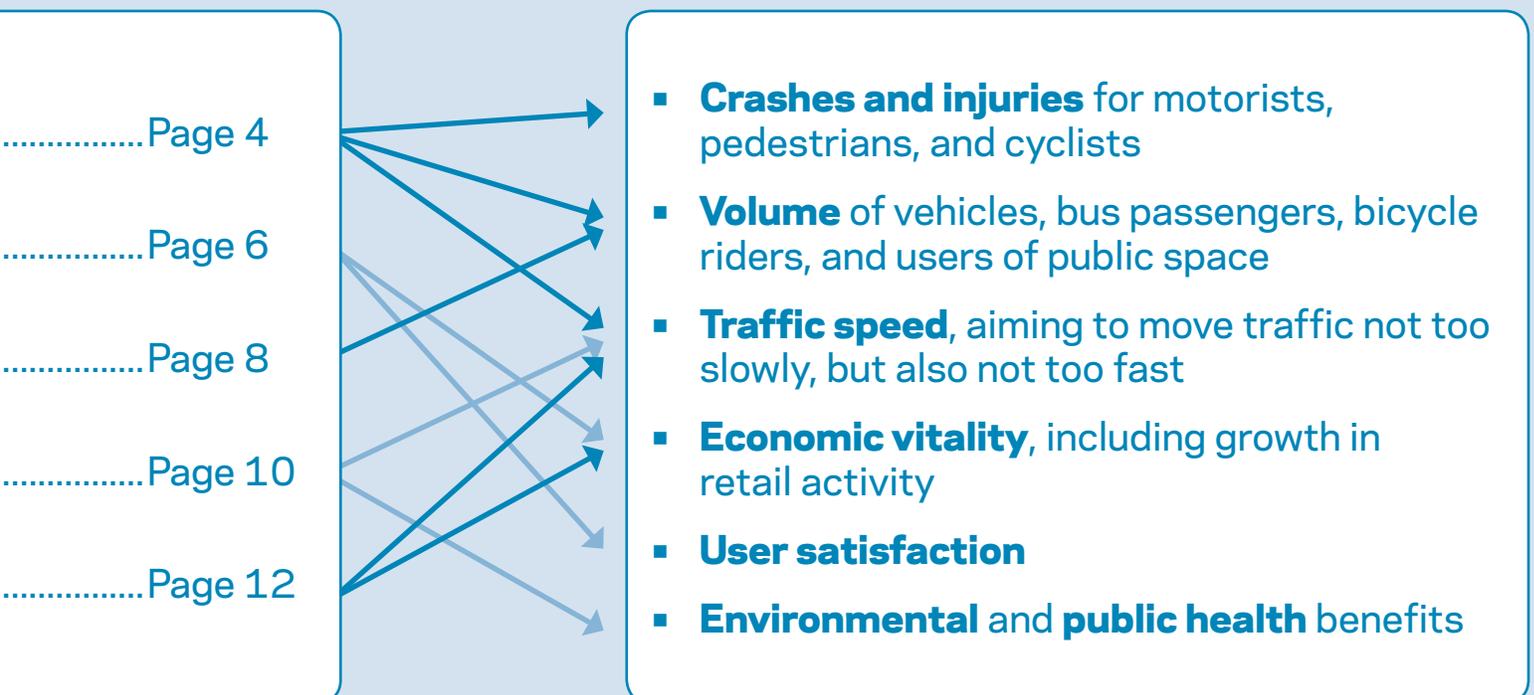
Efficiency in parking and loading to improve access to businesses and



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

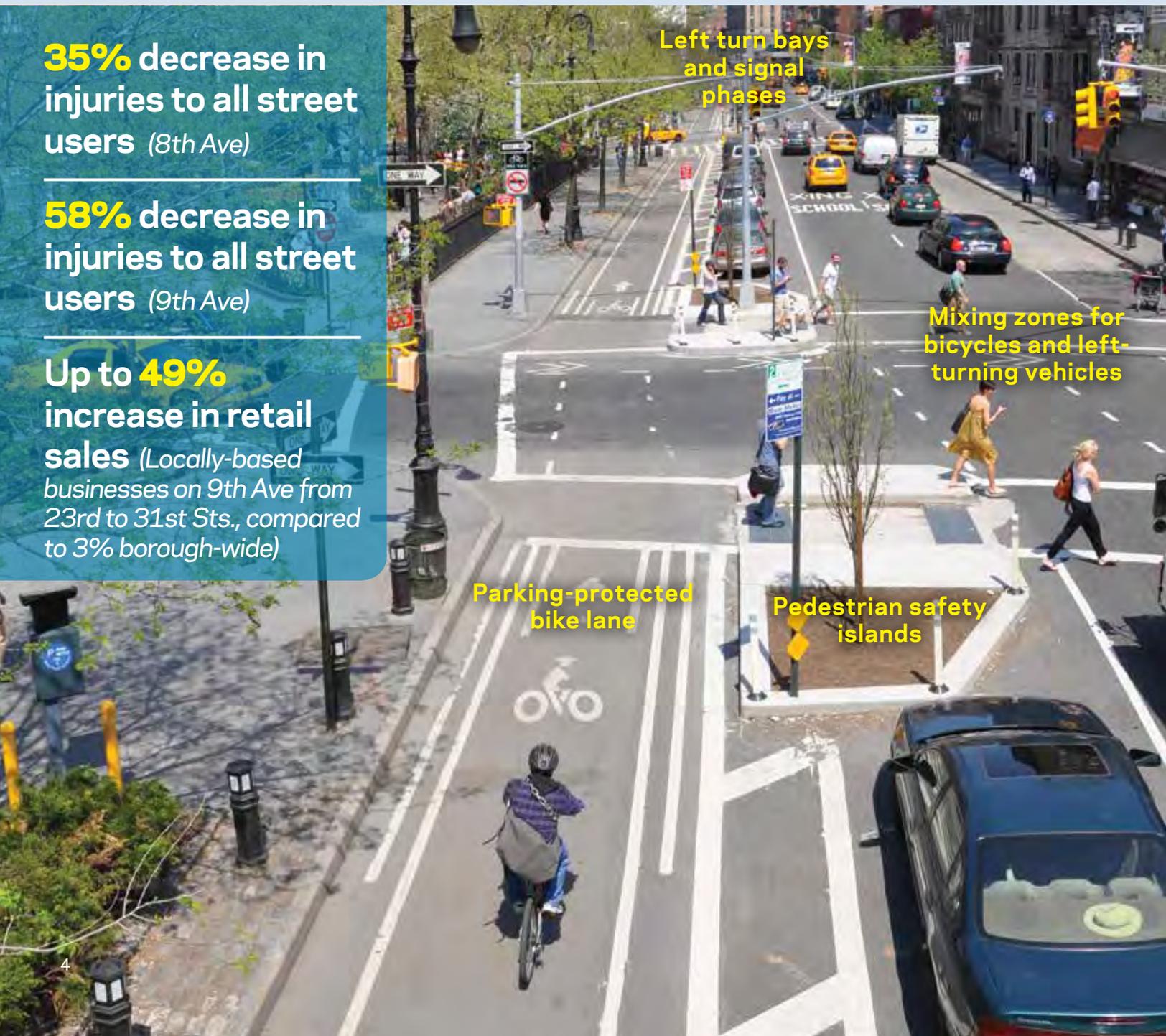
Safe and attractive options for all users

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



Protected
bicycle path

Pedestrian
plaza

Simplified
intersections

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

42nd St

2nd

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



NEW YORK CITY

