Safety Treatment Evaluation (2005-2018)

2022 – New York City Department of Transportation

From 2010-2021, NYC DOT completed over 1,000 Street Improvement Projects (SIPs), including over 100 miles of protected bike lanes, retimed signals for 25MPH on over 800 miles of streets, and installed over 5,000 leading pedestrian intervals (LPIs). As part of the Pedestrian Safety and Older New Yorkers report, NYC DOT conducted a wide-ranging before/after analysis of safety treatments to compare injury, severe injury, and fatality changes between seniors and non-senior adults. The agency identified seven treatments that were particularly powerful in terms of reducing injuries for senior pedestrians. Building on that work, DOT also analyzed safety outcomes for those same treatments for all road users, pedestrians and motor vehicle operators. Results were not generated for cyclists and other motorized users (e.g. e-scooters) due to small sample sizes. However, findings on how bicycle facilities reduce injury risk for cyclists can be found in NYC DOT's 2021 report "Safe Streets For Cycling". Those results are summarized at the end of this report.

Safety Treatments Analyzed:

- **Road Diets** (defined as, but not limited to, corridor projects with an added flush median, bike lane or a widened parking lane, and a removed vehicular moving lane for at least 1,000 feet)
- **Conventional Bicycle Lanes** (a lane defined only by paint, sometimes referred to as Class II Bicycle Facilities)
- **Protected Bicycle Lanes** (a lane protected by parking or some other physical barrier, sometimes referred to as Class I Bicycle Facilities)
- **Pedestrian Islands** (concrete and painted pedestrian islands and medians, as well as extensions of concrete medians – does not include bike lane islands)
- **Curb and Sidewalk Extensions** (including neckdowns)
- **Turn Calming** (markings, bollards and/or rubber speed bumps that slow and control turns)
- **Leading Pedestrian Intervals** (LPIs - providing a pedestrian crossing "head start" before vehicles receive the green light)

Methodology

NYC DOT employed a before/after injury analysis, comparing the average year of crash data before treatment installation to the average year of crash data after installation. In the before scenario, three years of crash data prior to the installation of a treatment were averaged, whereas in the after condition, two years were averaged in cases where three years of data was unavailable, otherwise three years of data were averaged. For this task, the report utilized comprehensive NYSDOT data which classifies injury crashes by severity. However, the availability and completeness of data for each treatment within this data set varies. Accordingly, NYC DOT relied on varying sample sizes for the evaluation of each treatment. When injuries were analyzed, fatal injuries were included as well.

Most of the treatments analyzed come from SIPs (2008-2016). LPIs are 2010-2016, with the majority in the latter years as NYC DOT ramped up the program. Turn Calming treatments are from 2016, the first year of the program. Crash data covers the years 2005-2018. The methodology used in this study differs slightly from that of a similar analysis performed in NYC DOT's *Pedestrian Safety and Older Adults* study. The latter limits analysis to crashes with one victim to allow matching victim age and severity, whereas the present study excludes victim age and therefore allows for multiple victim crashes to be included.

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All Road Users

Safety Treatment	Injury Change	KSI Change
Road Diets	-16.6%	-30.0%
Conventional Bike Lanes	1.1%	-15.3%
Protected Bike Lanes	-14.8%	-18.1%
Pedestrian Islands	-15.1%	-35.5%
Curb & Sidewalk Extensions	-10.4%	-34.1%
Turn Calming	0.3%	-16.2%
Leading Pedestrian Intervals (LPIs)	-13.5%	-29.6%

Pedestrians

Safety Treatment	Ped Injury Change	Ped KSI Change
Road Diets	-12.5%	-31.7%
Conventional Bike Lanes	-1.4%	-16.2%
Protected Bike Lanes	-17.8%	-29.2%
Pedestrian Islands	-10.2%	-29.9%
Curb & Sidewalk Extensions	-16.5%	-44.7%
Turn Calming	-17.5%	-32.7%
Leading Pedestrian Intervals (LPIs)	-18.1%	-34.3%

Motor Vehicle Occupants

Safety Treatment	MV Injury Change	MV KSI Change
Road Diets	-19.3%	-33.8%
Conventional Bike Lanes	-1.1%	-25.1%
Protected Bike Lanes	-19.0%	-13.1%
Pedestrian Islands	-18.1%	-52.0%
Curb & Sidewalk Extensions	-10.1%	-24.1%
Turn Calming	13.6%	50.7%*
Leading Pedestrian Intervals (LPIs)	-13.5%	-28.5%

*Motor Vehicle KSI at Turning Calming locations rose from an annual average of 7.3 KSI in the before period to 11 KSI in the after period. Due to this small sample size of severe injuries, it is likely that this large increase (50.7%) is not as accurate as other report findings.

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Sample Size

Safety Treatment	Treatments	Centerline Miles
Road Diets	**28**	**29.1**
Conventional Bike Lanes	**542**	**133.8**
Protected Bike Lanes	**146**	**36.7**
Pedestrian Islands	**177**	**2.1**
Curb & Sidewalk Extensions	**266**	**9.5**
Turn Calming	**107**	**NA**
Leading Pedestrian Intervals (LPIs)	**1446**	**NA**

Citywide Background Trend

New York City's streets have changed substantially over the last decade as improvements made under Vision Zero have strongly emphasized safety for vulnerable road users. These changes, including new signal timing, speed cameras, road diets, protected bike lanes and turn calming, may have played an important role in making the city considerably safer for pedestrians in terms of severe injuries and fatalities. All injuries (including all minor injuries) declined annually on average over the study period, even as New York City's population grew. Injuries for all road users fell 0.4% and KSI fell 2.8%.

Safe Streets For Cycling Report

This 2021 study evaluated the safety and ridership of NYC's on-street bicycle lanes. The analysis reflects the planning and design decisions of NYC DOT's bicycle projects by measuring the changes in cyclist risk (cyclist injuries per 10M cyclists per mile), before and after installation.

Overall

- System-wide, the combination of bike lane types reduced bicycling risk by -32%

Protected Bike Lanes (Class 1)

- Risk reduction of -34% across all study projects
- On the highest risk streets, cyclist risk is reduced by over -60%
- Both boroughs with large enough Protected Bike Lane sample sizes have reductions in cyclist risk: Queens (-40%) and Manhattan (-26%)

Conventional Bike Lanes (Class 2)

- Risk reduction of -32% across all study projects
- Improved safety on all streets, particularly on low and mid- volume streets (-42%, -26% reduction in risk respectively)
- The Bronx and Brooklyn have risk reductions of -34% and in Manhattan cyclist risk decreased by -28% (the boroughs with large enough sample sizes)