

Physical Environmental Roadway Interventions and Injury and Death for Vulnerable Road Users in New York City

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Physical environmental roadway interventions and injury and death for vulnerable road users: a natural experiment in New York City

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ABSTRACT

Introduction This study examined the effectiveness of three physical environmental roadway interventions (enhanced crossings, speed humps, and turn traffic calming) in preventing crashes involving pedestrian and cyclist injury and mortality in New York City.

Methods We examined crashes that occurred within a 100-foot radius of intervention and control sites from 2015 to 2019. We used a staggered difference-in-difference design to estimate the association between each intervention type and pedestrian and cyclist crash outcomes.

Results Estimates for enhanced crossings and speed humps included the possibility of no association with crashes, but estimates for turn traffic calming interventions showed reduced odds of crashes involving pedestrian injury by 16% (OR 0.84, 95% CI 0.74 to 0.95) and crashes involving pedestrian fatality by 80% (OR 0.20, 95% CI 0.08 to 0.47). When stratifying by street segment length as a proxy for areas with high speeding risk, turn traffic calming treatments appeared to be most effective at intersections connected to long street segments.

Discussion Turn traffic calming may substantially reduce crash risks for pedestrians. Municipalities can prioritise this physical environmental intervention, especially at turns near long street segments, as a low-

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Vulnerable road users, such as pedestrians and cyclists, are at high risk of injury and mortality due to motor vehicle collisions.
- ⇒ New York City has implemented new traffic safety measures in the form of physical environmental roadway interventions to combat serious injury and death which have not been systematically evaluated for public health benefit.

WHAT THIS STUDY ADDS

- ⇒ Turn traffic calming treatments appear to lower the odds of crashes involving pedestrian injury or fatality in New York City.
- ⇒ Turn traffic calming treatments may be most effective in areas that are particularly prone to speeding, such as intersections that are connected to long street segments.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ The effectiveness of different physical environmental roadway interventions should be considered when choosing how to use limited resources for optimal public health benefit.

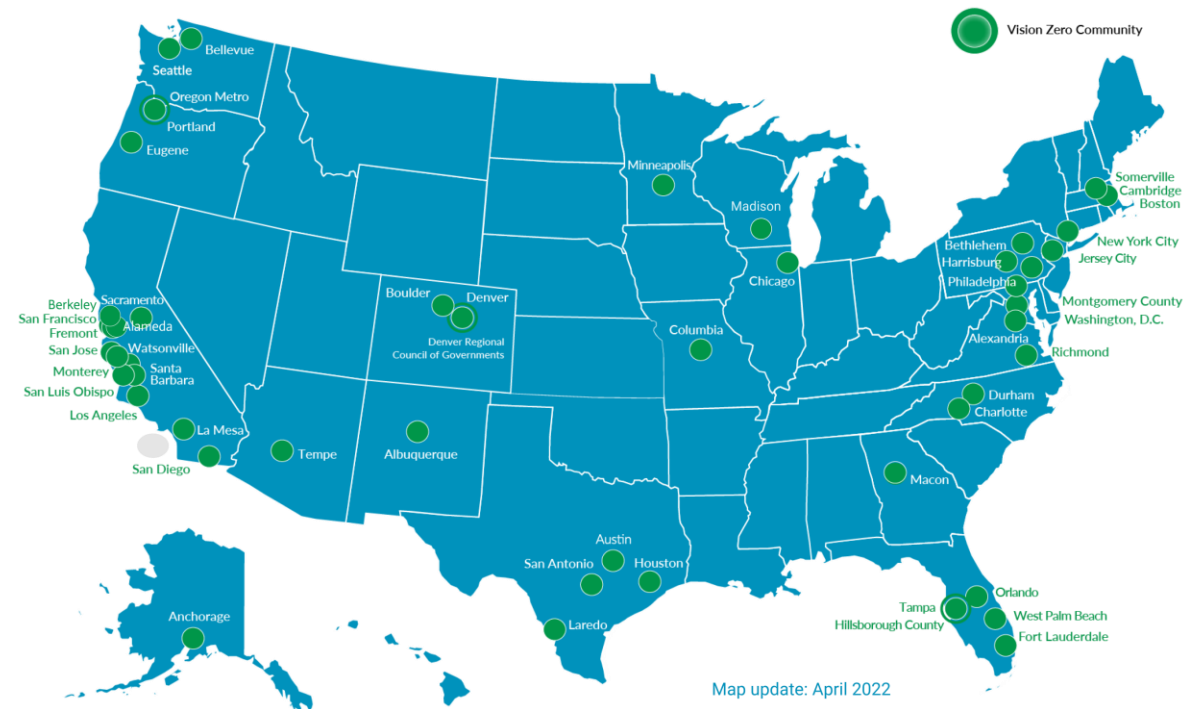


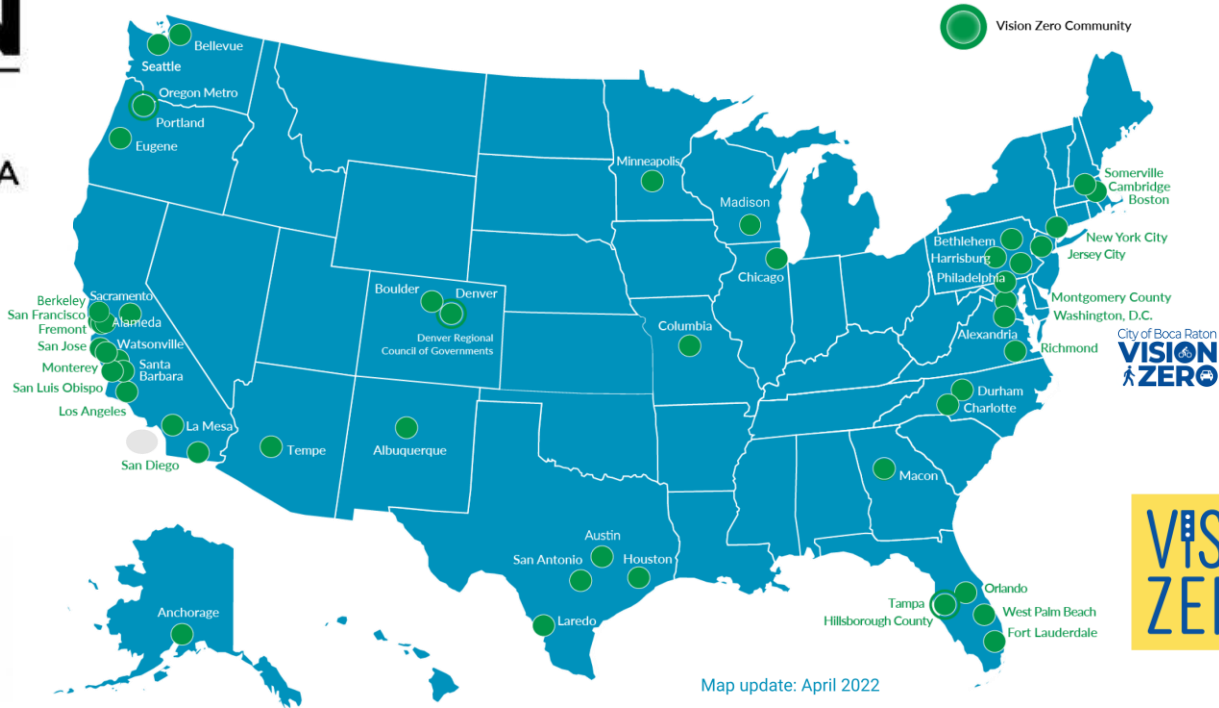


VISION ZERO

nyc.gov/visionzero

VISION ZERO NETWORK







Engineering



Education



Enforcement



Legislation



Study Design

- **Design:** Staggered difference-in-difference
- **Interventions:** Enhanced crossings, speed humps, and turn traffic calming
- **Outcomes:** Crashes involving pedestrian and cyclist injury or mortality within a 100-foot radius of intervention and control sites from 2015 to 2019
- **Analysis:** Two-way fixed effects logistic regression
- **Stratified analyses:** Conducted to estimate effect modification between turn traffic calming and pedestrian outcomes by surrounding street segment length (a proxy for speeding risk)

Filters

View Types

☐ Datasets
 ☐ External Datasets
 ☐ Files and Documents
 ☐ Filtered Views
 ☐ Maps

Data Collection

☐ 2018 Central Park Squirrel Census
 ☐ Asset Management Parks System (AMPS)
 ☐ Capital Projects
 ☐ Dashboard
 ☐ CCRB Complaints Database
 ☐ Citywide Mobility Survey
 [See more](#)

Agency

☐ Administration for Children's Services (ACS)
 ☐ Board of Elections (BOENY)
 ☐ Board of Standards and Appeals (BSA)
 ☐ Bronx Borough President (BPPX)
 ☐ Brooklyn Borough President (BPPK)
 [See more](#)

Categories

☐ Business
 ☐ City Government
 ☐ Education
 ☐ Environment

29 Results

Sort by Most Relevant ▾

Vision Zero View Data

Public Safety

External Link

Data that that populates the Vision Zero View map, which can be found at www.nycvzv.info Vision Zero is the City's goal for ending traffic deaths and injuries. The Vision Zero action plan can be found at [More](#)

Updated June 2, 2020
Views 13,603

Tags transportation, street, slow zone, public safety, vision zero, and 8 more

Vision Zero Base Report

Transportation

Dataset

The Vision Zero Base Reports are collections of facts and statistics about individual TLC-regulated for-hire vehicle (FHV) businesses produced to help passengers identify businesses with the best safety records and support the for-hire [More](#)

Updated May 9, 2022
Views 5,111

Tags No tags assigned [API Docs](#)

VZV_Leading Pedestrian Interval Signals

Transportation

Map

Intersections where DOT installs signals that show a walk sign for pedestrians before showing a green light to vehicle traffic. The goal of these signals is to improve street safety by giving pedestrians a chance to establish their presence in [More](#)

Updated August 28, 2024
Views 4,818

Tags pedestrian, vz, vision zero, signal, vzv, and 1 more

VZV_Speed Humps

Transportation

Map

Speed Humps are a raised area of a roadway designed to reduce vehicle speeds. Dates reflect the first time a speed hump was installed at a location, subsequent removals and/or re-installations are not included. [More](#)

Updated August 14, 2024
Views 6,015

Tags vz, hump, vzv, vision zero view, speed, and 3 more

VZV_Speed Limits

Transportation

Map

On November 7, 2014, New York City's default speed limit was changed from 30 mph to 25 mph. Unless otherwise signed, all streets in New York City are governed by this 25 mph speed limit. Driving at or below 25 MPH decreases stopping [More](#)

Updated August 14, 2024
Views 9,580


Tags vision zero, limit, speed, vision zero view, vz, and 1 more

Motor Vehicle Collisions - Crashes

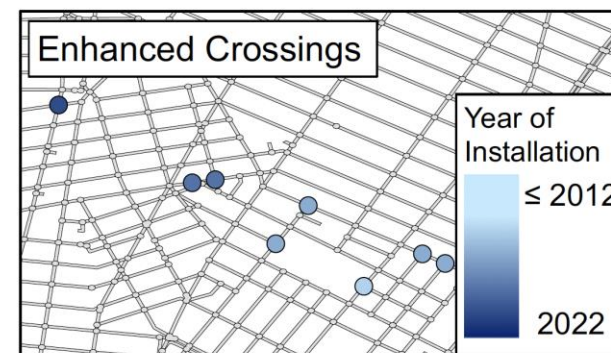
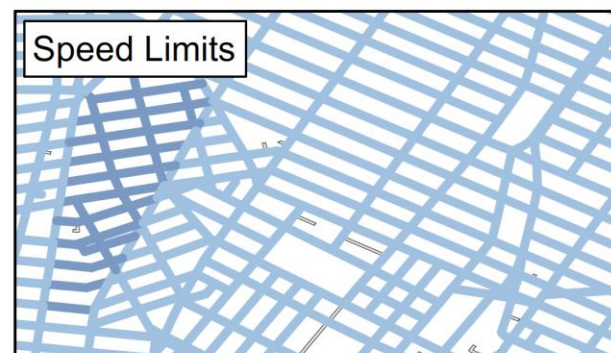
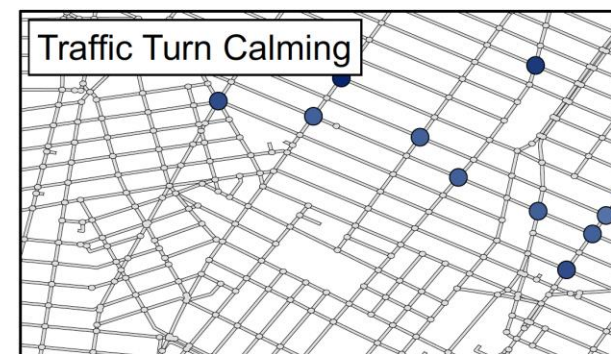
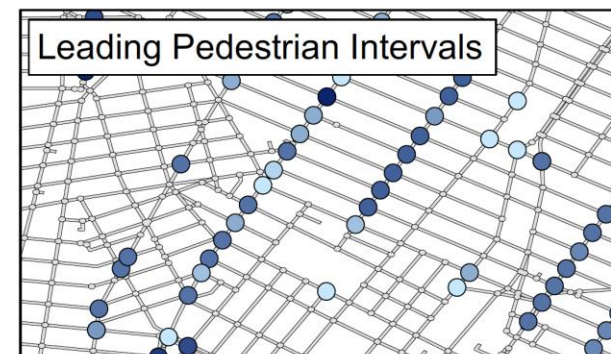
Public Safety

Dataset

The Motor Vehicle Collisions crash table contains details on the crash event. Each row represents a crash event. The Motor

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11



Enhanced Crossings



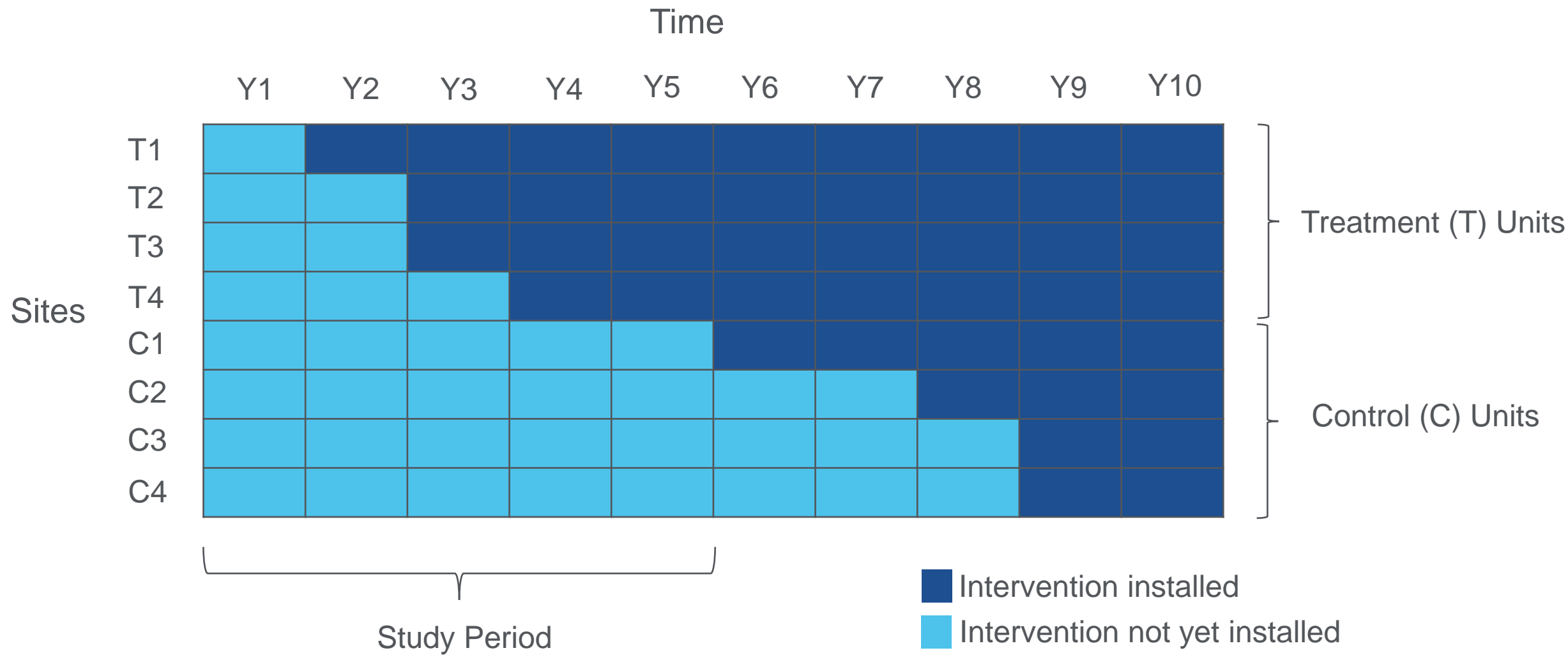


Speed Humps

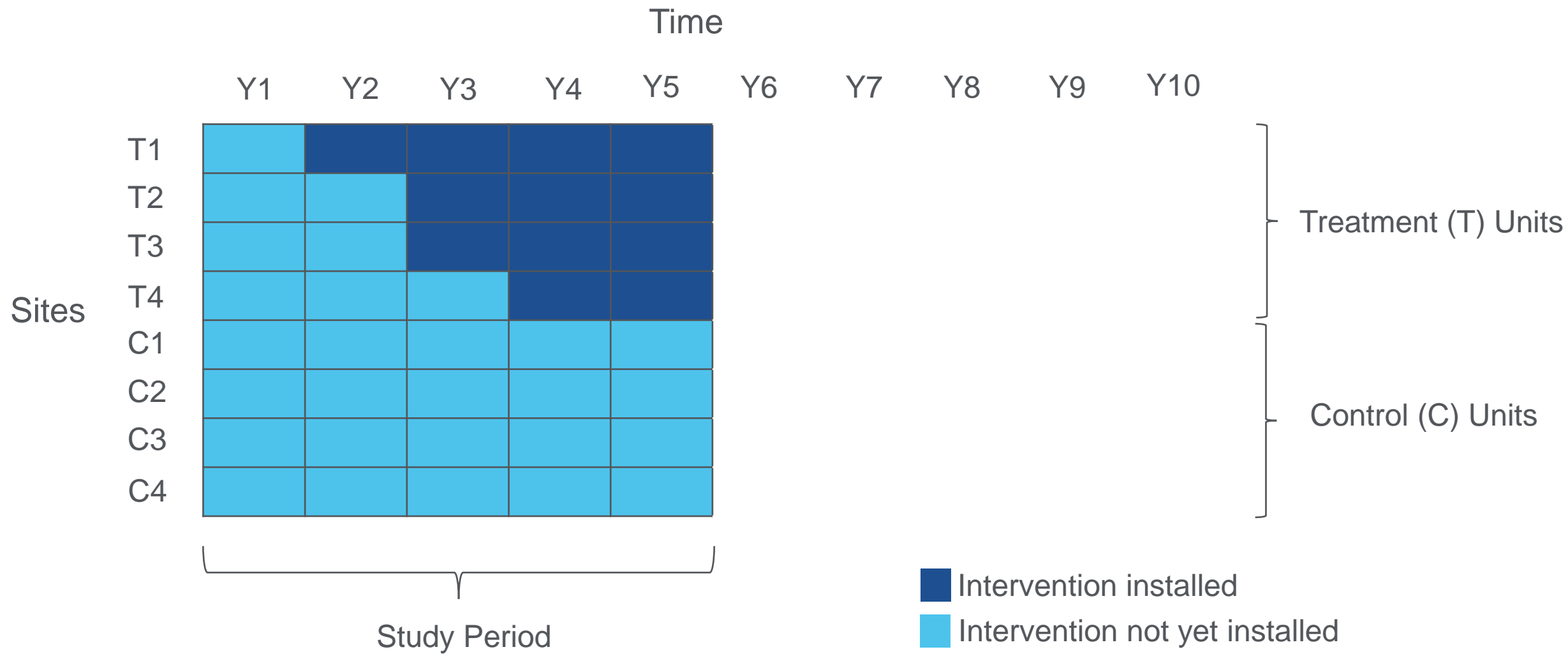
Turn Traffic Calming



Site Selection



Site Selection



Motor Vehicle Crashes

NYC OpenData Home Data About ▾ Learn ▾ Contact Us 🔍 Sign In

🔍 motor vehicle collisions

4 Results Sort by Most Relevant ▾

Filters

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Data Collection ^

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- ☐ CCRB Complaints

<p>Motor Vehicle Collisions - Crashes Public Safety</p> <p>The Motor Vehicle Collisions crash table contains details on the crash event. Each row represents a crash event. The Motor Vehicle Collisions data tables contain information from all police reported motor vehicle collisions in NYC. The police</p> <p>More</p> <p>Tags vision, traffic data, visionzero, zero, nypd, and 4 more</p> <p>API Docs</p>	<p>Dataset</p> <p>Updated October 21, 2024</p> <p>Views 584,423</p>
<p>Motor Vehicle Collisions - Person Public Safety</p> <p>The Motor Vehicle Collisions person table contains details for people involved in the crash. Each row represents a person (driver, occupant, pedestrian, bicyclist,...) involved in a crash. The data in this table goes back to April 2016 when crash</p> <p>More</p> <p>Tags nypd, visionzero, collisions, zero, nycpendata, and 5 more</p> <p>API Docs</p>	<p>Dataset</p> <p>Updated October 21, 2024</p> <p>Views 20,250</p>
<p>Motor Vehicle Collisions - Vehicles Public Safety</p> <p>The Motor Vehicle Collisions vehicle table contains details on each vehicle involved in the crash. Each row represents a</p>	<p>Dataset</p> <p>Updated</p>

Results

Intervention	Outcome	OR	95% CI
Enhanced Crossings	Cyclist injured or killed		
	Pedestrian injured or killed		
Speed Humps	Cyclist injured or killed		
	Pedestrian injured or killed		
Turn Traffic Calming	Cyclist injured or killed		
	Pedestrian injured or killed		

Results

Intervention	Outcome	OR	95% CI
Enhanced Crossings	Cyclist injured or killed	0.51	0.14, 1.80
	Pedestrian injured or killed	0.94	0.49, 1.80
Speed Humps	Cyclist injured or killed	0.94	0.79, 1.13
	Pedestrian injured or killed	0.91	0.80, 1.02
Turn Traffic Calming	Cyclist injured or killed	0.89	0.74, 1.07
	Pedestrian injured or killed	0.82	0.72, 0.92

Results

Intervention	Outcome	OR	95% CI
Enhanced Crossings	Cyclist injured or killed	0.51	0.14, 1.80
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	Pedestrian injured or killed	0.91	0.80, 1.02
Turn Traffic Calming	Cyclist injured or killed	0.89	0.74, 1.07
	Pedestrian injured or killed	0.82	0.72, 0.92
	Pedestrian injured	0.84	0.74, 0.95
	Pedestrian killed	0.20	0.08, 0.47

Effect Modification



Turn Traffic Calming

Longest Street Segment Quartiles	OR	95% CI
Shortest Quartile		
Second		
Third		
Longest Quartile		

Turn Traffic Calming

Longest Street Segment Quartiles	OR	95% CI
Shortest Quartile	0.94	0.75, 1.18
Second	0.86	0.64, 1.15
Third	0.80	0.62, 1.03
Longest Quartile	0.70	0.55, 0.88

Conclusions

Conclusions



Conclusions



Conclusions



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www.thegapslab.org