IMPACT OF SEPARATED BIKE LANES ON TRAFFIC SAFETY

February 2025

CITY of BOSTON

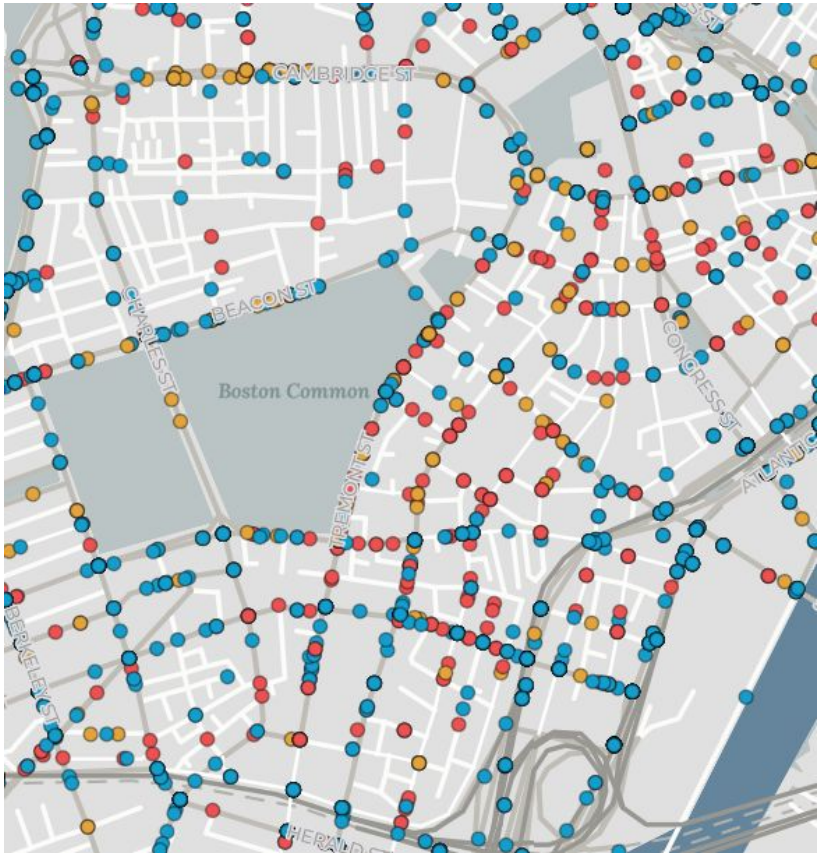
RESEARCH QUESTIONS

External research studies have shown that separated bike lanes are associated with increased safety outcomes for all road users, not just people riding bikes. In our study, we sought to understand:

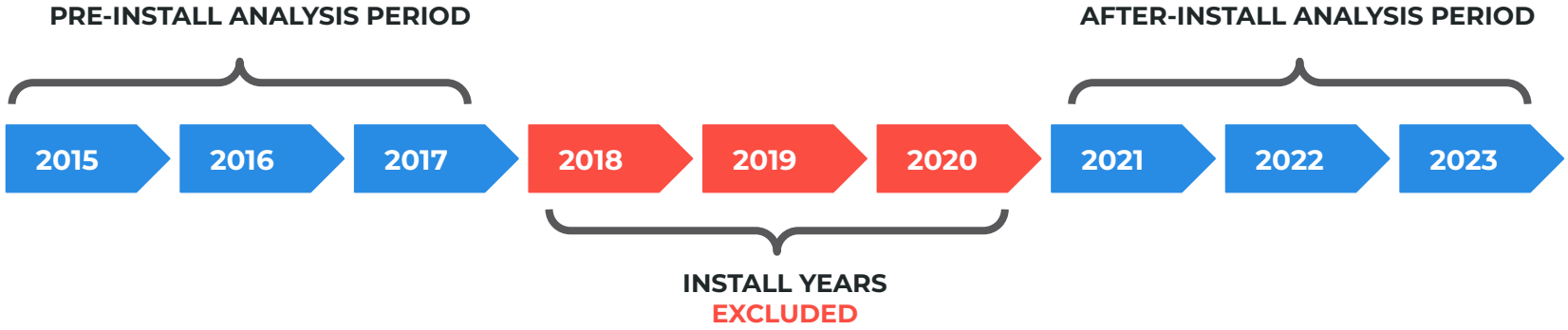
- Has the installation of separated bike lanes in the City of Boston been correlated with changes in the number of crashes resulting in injuries when compared to control locations?
- Are pedestrian-involved, bicyclist-involved, and motor vehicle-only crashes impacted differently by the installation of separated bike lanes?

METHODOLOGY & SOURCES

- We used crash data pulled from the City's Vision Zero dashboard. These are crashes resulting in injuries or fatalities reported by Boston EMS.
- We evaluated projects with at least three years of “before” and “after” install data.
- We included projects longer than roughly one block (0.15 miles).
- We included the full extent of each project, meaning we counted crashes occurring at the projects’ starting and ending intersections despite projects not usually having fully-designed protections at the limits.



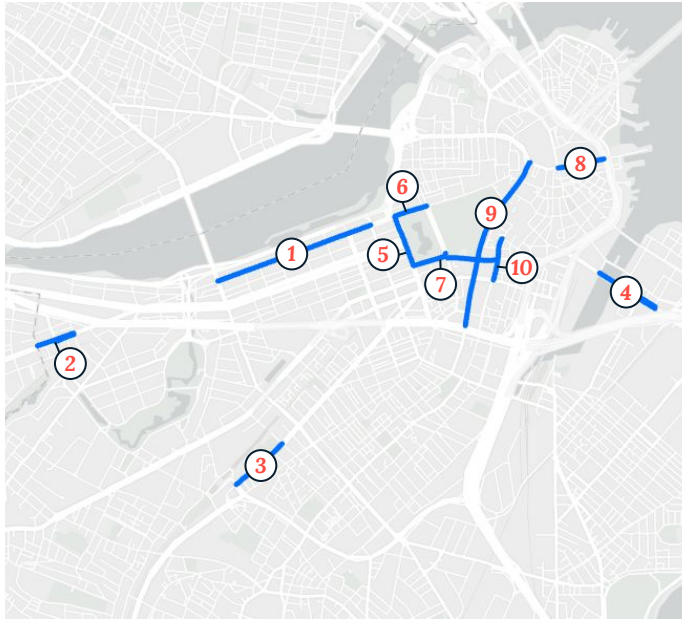
METHODOLOGY & SOURCES



- "Before" counts reflect crashes resulting in injuries that occured between 2015-2017, while "after" counts occurred between 2021-2023. We excluded 2018-2020 crashes because:
  - It allows us to apply the same “before” and “after” windows to all projects, even if they were installed in different years.
  - Excluding the installation year affords a period of adjustment to the roadway redesign.
  - Excluding 2020 removes the greatest outlier year from the data set as a result of COVID.
- We included only full years in the “before” and “after” periods due to the fluctuation of road user volumes from season to season.

PROJECTS EVALUATED

1. BEACON ST (BERKELEY ST TO MASS AVE), 2018
2. BEACON ST (MINER ST TO PARK DR/ST MARY'S ST), 2018
3. COLUMBUS AVE (CAMDEN ST TO MELNEA CASS BLVD), 2018
4. SUMMER ST (DORCHESTER AVE TO SOUTH BOSTON BYPASS RD), 2019
5. ARLINGTON ST (BEACON ST TO BOYLSTON ST), 2020
6. BEACON ST (CHARLES ST TO ARLINGTON ST), 2020
7. BOYLSTON ST (ARLINGTON ST TO WASHINGTON ST), 2020
8. STATE ST (CONGRESS ST TO SURFACE RD), 2020
9. TREMONT ST (COURT ST TO MARGINAL RD), 2020
10. WASHINGTON ST (KNEELAND ST TO AVE DE LAFAYETTE), 2020



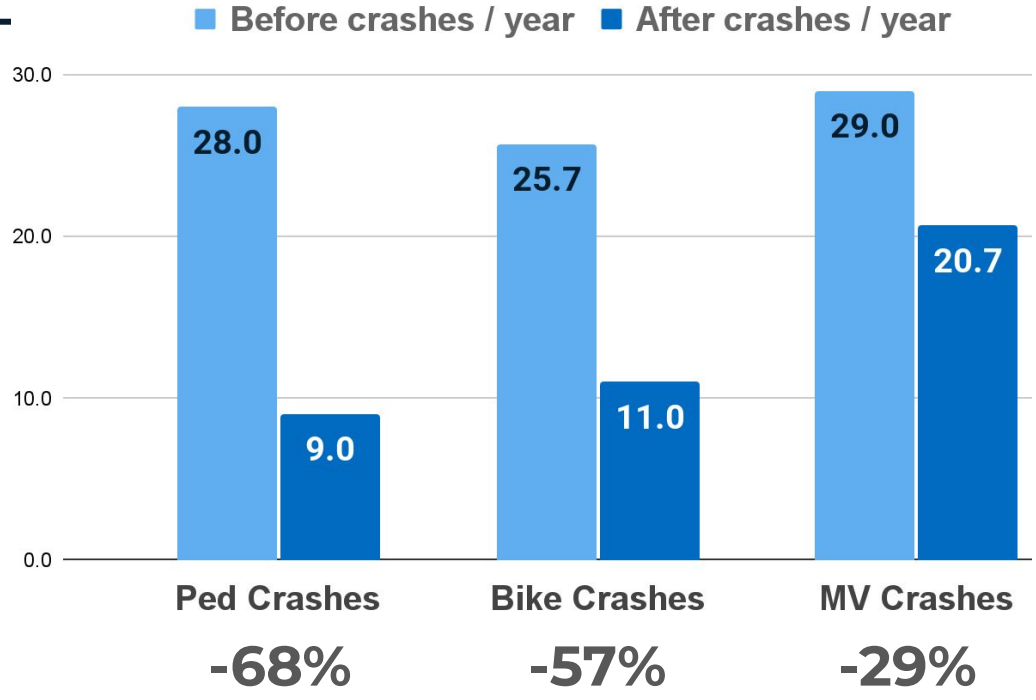
KEY TAKEAWAYS

After separated bike lanes were installed, there were significantly fewer crashes.

- Following the installation of separated bike lanes, pedestrian crashes decreased by **68%**, bike crashes by **57%**, and motor vehicle crashes by **29%**.
- Across all modes, there were **half as many annual crashes** after installation of separated bike lanes.*

** Our sample size for all project streets combined is 370 crashes (248 before, 122 after), a 51% decrease across all modes.*

ANNUAL CRASHES ON ALL PROJECT STREETS BEFORE AND AFTER SEPARATED BIKE LANES

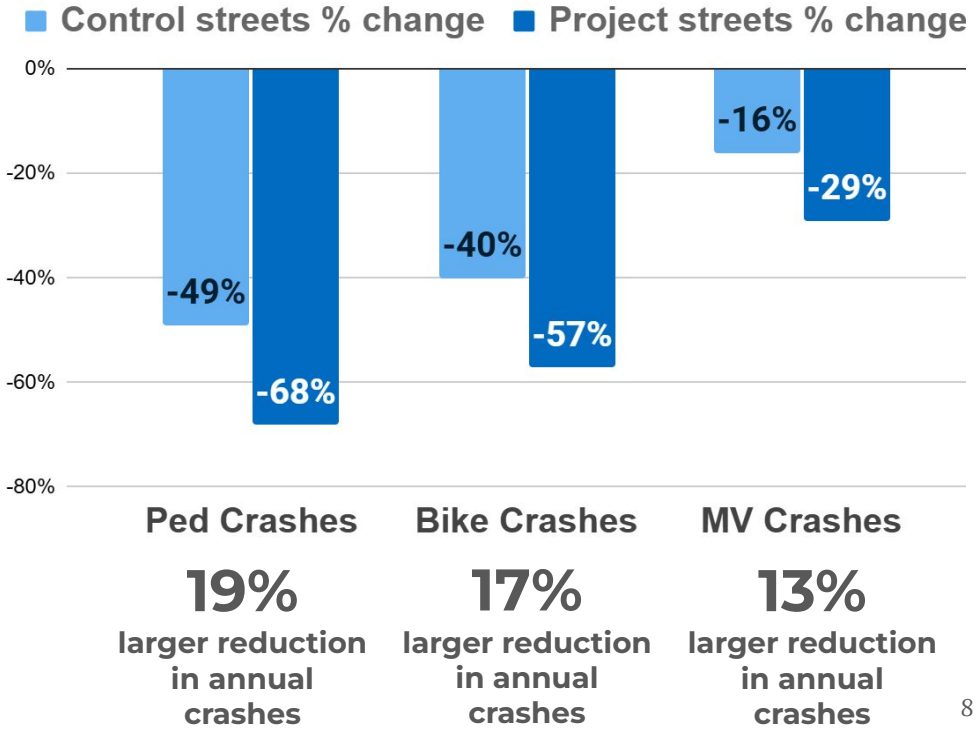


While crashes have been declining citywide, there were larger decreases in crashes on streets with new separated bike lanes.

- Decreases in annual crashes on streets with new separated bike lanes were between **13% and 19% greater** than control streets.
- Across all modes, annual crashes **decreased by 51%** on streets with new separated bike lanes compared to **29%** on control streets.

**Control streets include collectors and arterials within a 0.75 mile radius of all projects. Streets where the City installed bike lanes between 2015-2023 are excluded.*

CHANGE IN ANNUAL CRASHES BEFORE AND AFTER SEPARATED BIKE LANES: PROJECT STREETS VS. CONTROL STREETS*

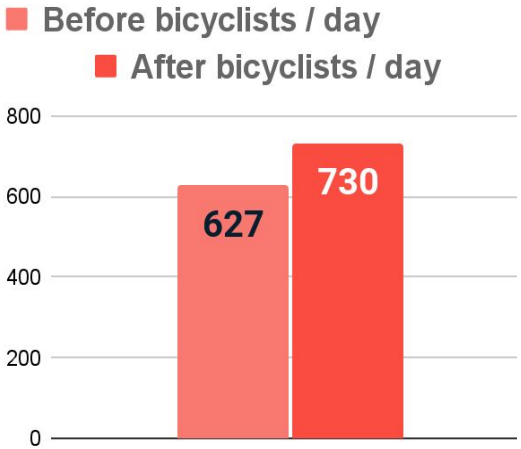


Significant decreases in bike crashes occurred even as the number of people biking increased.

- On Washington Street and Summer Street (averaged), **bike crashes decreased by 86%** even as **bike volumes increased by 16%** over the same period.*

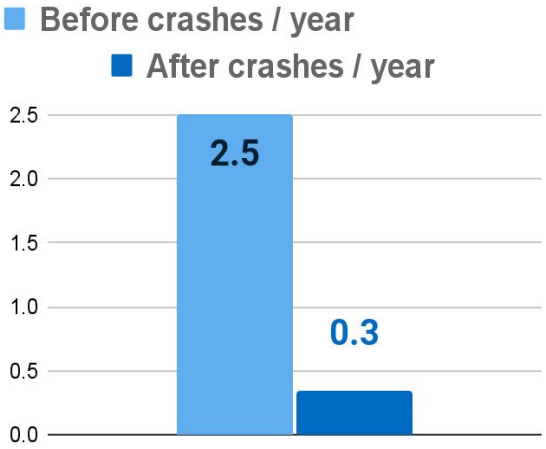
** These are the only two streets in the data set for which we have historic daily bike & motor vehicle volumes. No historical data is available for 2015. We used 2016-2018 as our "before" and 2021-2023 as our "after" analysis periods.*

DAILY BIKE VOLUMES VS. ANNUAL CRASHES: WASHINGTON ST. AND SUMMER ST. BIKE LANES (AVG.)



Bike volumes

+16%



Bike crashes

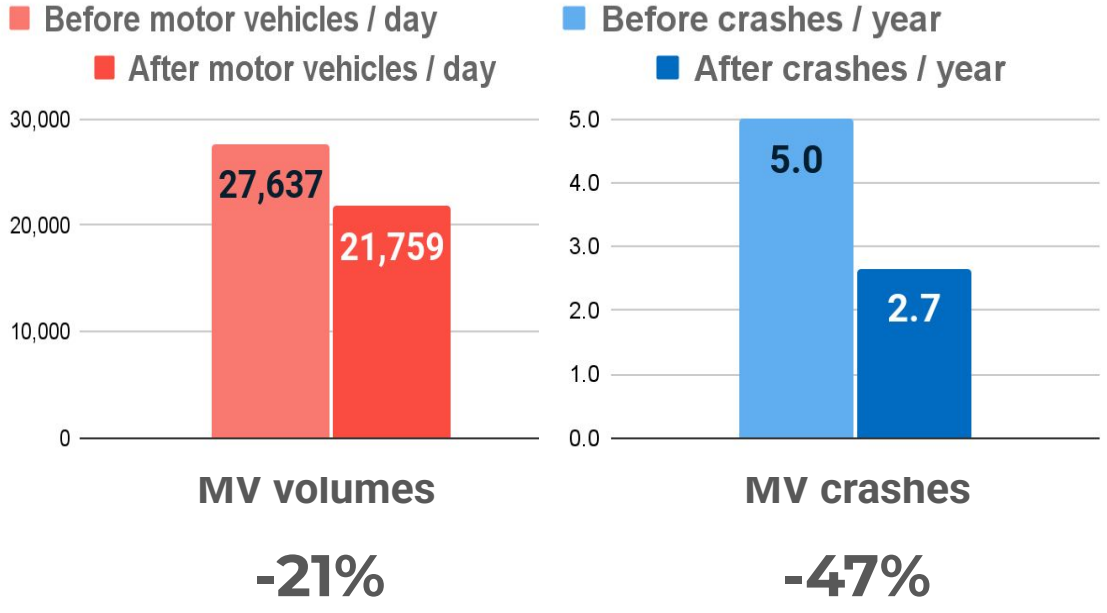
-86%

Crashes involving motor vehicles declined more significantly than motor vehicle volumes.

- On Washington Street and Summer Street (averaged), **crashes involving only motor vehicles decreased by 47%** while **motor vehicle volumes decreased by 21%** over the same period.*

** These are the only two streets in the data set for which we have historic daily bike & motor vehicle volumes. No historical data is available for 2015. We used 2016-2018 as our "before" and 2021-2023 as our "after" analysis periods.*

DAILY MOTOR VEHICLE VOLUMES VS. ANNUAL CRASHES: WASHINGTON ST. AND SUMMER ST. BIKE LANES (AVG.)



RESEARCH QUESTIONS: ANSWERS

External research studies have shown that separated bike lanes are associated with increased safety outcomes for all road users, not just people riding bikes. In our study, we sought to understand:

- Has the installation of separated bike lanes in the City of Boston been correlated with changes in the number of crashes resulting in injuries when compared to control locations?
  - **Yes.** Annual crashes decreased on streets with separated bike lanes at a greater rate than on nearby streets.
- Are pedestrian-involved, bicyclist-involved, and motor vehicle-only crashes impacted differently by the installation of separated bike lanes?
  - **Yes.** Crash reduction across all modes was more significant on streets with separated bike lanes than on control streets. Pedestrians saw the greatest decreases followed closely by bicyclists.

WHY BIKE LANES BENEFIT EVERYONE

- Narrower or reduced travel lanes = decrease in motor vehicle speeds
- Shorter crossings = additional refuge for pedestrians
- Daylighting/clear sightlines = increased visibility at crosswalks

BEFORE:

50 ft crossing across **four** lanes of traffic

AFTER:

25 ft crossing across **two** lanes of traffic

Source: Marshall, Wesley E. and Nicholas N. Ferenchak. "Why cities with high bicycling rates are safer for all road users." *Journal of Transport & Health* (2019).

RESEARCH BEYOND BOSTON

Recent evaluations of other U.S. cities have yielded results similar to what we're seeing in Boston.

- A 13-year study of a dozen U.S. cities found that separated bike lanes make streets safer for everyone, whether they are walking, driving, or biking. These cities saw 44% fewer fatalities and 50% fewer serious injuries from crashes after installing separated bike lanes.

- An analysis of almost 10,000 motor vehicles in Asbury Park, New Jersey found that separated bike lanes were associated with a reduction in motor vehicle speeds of 20 to 30 percent. The higher the speed of the motor vehicle, the greater the likelihood of a severe crash.