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**Has New York City Vision Zero Reduced Accidents, Injuries and Deaths?**

Vision Zero is the idea of having a traffic system which has no serious injuries or deaths. The idea started almost 20 years ago in Sweden based on the idea that deaths *can* be prevented so we have the obligation to do so at any cost. There are several overarching principles such as ethics (Human life and health are paramount and take priority over mobility and other objectives of the road traffic system) and safety (road traffic systems should take account of human fallibility and minimize both the opportunities for errors and the harm done when they occur); and then actionable changes such as appropriate speed limits and road designs.

Shortly after Bill de Blasio became mayor in January 2014 he created New York City Vision Zero with the goal of eliminating traffic fatalities by 2025. It is comprised of many different initiatives such as a citywide reduction of the speed limit from 30 miles per hour to 25, increasing enforcement of traffic laws and structural changes such as speed humps. As of now it has been almost two years since the plan was put into place, and many of the initiatives are in progress or complete. The city’s official report on the first year shows that fatalities were down and that it is due to vision zero changes. But have New York City roads truly become safer and if so can we attribute that to vision zero?

**Research**

About Vision Zero in general, its principals and proposals and an article questioning vision zero:

* Tingvall, Claes, and Narelle Haworth. "Vision Zero - An Ethical Approach to Safety and Mobility." *6th ITE International Conference Road Safety & Traffic Enforcement*, 1999.
* Elvik, Rune. "Can Injury Prevention Efforts Go Too Far?" *Accident Analysis & Prevention*: 265-86.

Official information about New York City Vision Zero such as the initiatives and official report on the results from the first year:

* <http://www.nyc.gov/html/visionzero/pages/home/home.shtml>
* <http://www.nyc.gov/html/visionzero/pages/the-plan/library.shtml>
* <http://www.nyc.gov/html/visionzero/assets/downloads/pdf/vision-zero-1-year-report.pdf>
* <http://www.nyc.gov/html/dot/downloads/pdf/2014-10-twenty-five-mile-speed-limit-faq.pdf>

About the relation between the speed of a vehicle and the likelihood of a hit pedestrian surviving:

* <http://humantransport.org/sidewalks/SpeedKills.htm>

An overview of research into the relation between speed and crashes:

* Aarts, Letty, and Ingrid Van Schagen. "Driving Speed and the Risk of Road Crashes: A Review." *Accident Analysis & Prevention*, 2005, 215-24.

Mathematical models of vehicle interactions and accidents:

* Navon, David. "The Paradox of Driving Speed: Two Adverse Effects on Highway Accident Rate." *Accident Analysis & Prevention*, 2003, 361-67.
* Aljanahi, A.a.m, A.h Rhodes, and A.v Metcalfe. "Speed, Speed Limits and Road Traffic Accidents under Free Flow Conditions." *Accident Analysis & Prevention*, 1999, 161-68.

Studies on real accident data which assess cause of the accidents:

* Shibata, Akira, and Katsuhiro Fukuda. "Risk Factors of Fatality in Motor Vehicle Traffic Accidents." *Accident Analysis & Prevention*, 1994, 391-97.
* Vorko-Jović, Ariana, Josipa Kern, and Zrinka Biloglav. "Risk Factors in Urban Road Traffic Accidents." *Journal of Safety Research*, 2006, 93-98.
* Al-Ghamdi, Ali S. "Pedestrian–vehicle Crashes and Analytical Techniques for Stratified Contingency Tables." *Accident Analysis & Prevention*, 2002, 205-14.
* Al-Ghamdi, Ali S. "Analysis of Traffic Accidents at Urban Intersections in Riyadh." *Accident Analysis & Prevention*, 2003, 717-24.
* Norris, Fran H, B.alex Matthews, and Jasmin K Riad. "Characterological, Situational, and Behavioral Risk Factors for Motor Vehicle Accidents: A Prospective Examination." *Accident Analysis & Prevention*, 2000, 505-15.

Before and after studies on traffic accidents in places where accident reduction measures were taken:

* Rock, Steven M. "Impact of the 65 Mph Speed Limit on Accidents, Deaths, and Injuries in Illinois." *Accident Analysis & Prevention*, 1995, 207-14.
* Wong, S.c., N.n. Sze, Hong K. Lo, W.t. Hung, and Becky P.y. Loo. "Would Relaxing Speed Limits Aggravate Safety?" *Accident Analysis & Prevention*, 2005, 377-88.
* Wong, S.c, B.s.y Leung, Becky P.y Loo, W.t Hung, and Hong K Lo. "A Qualitative Assessment Methodology for Road Safety Policy Strategies." *Accident Analysis & Prevention*, 2004, 281-93.

European Transport Safety Council’s study and proposals to reduce speed and injuries:

* <http://www.cetsp.com.br/media/412361/4reducing-traffic-injuries-from-excess-and-inappropriate-speed-1-.pdf>

**Data**

The primary dataset available to evaluate vision zero is the NYPD Motor Vehicle Collisions dataset:

<https://data.cityofnewyork.us/Public-Safety/NYPD-Motor-Vehicle-Collisions/h9gi-nx95>

It contains an entry for each crash from July 1 2012 to the present (with about a week’s lag). For each crash it lists the total number of people injured and killed, as well the same data broken down by pedestrians, cyclists and motorists. And then details for up to 5 vehicles such as the contributing factor to the crash.

There are also datasets of the street design changes being done:

<http://www.nyc.gov/html/dot/html/about/vz_datafeeds.shtml>

But these don’t in general contain any information such as date of change, so it might be difficult to discern any results from this.

There are a couple of datasets which I haven’t yet found, but would be useful: data on streets which haven’t had their speed limits changed to provide a control sample; and data on actual traffic speeds, to see if speeds have actually reduced.

**Methodology**

There are a few different analyses I plan to do. The first is a simple before and after analysis on the accident data for the whole to see if there has been a change after the implementation of Vision Zero, for example using linear regression before and after and comparing the confidence intervals for an intersection.

Using the data on infrastructural changes, I’d like to look to see if there is any geospatial correlation between the change in accidents and the introduction of structural changes. For example, the neighborhood slow zones are well defined areas that can be assessed separately from the city as a whole.

If I can get data on which streets still have their old speed limits, then I will do a comparison of the changes across the city as a whole versus the streets which haven’t changed, for example using a t-test.

**Expected Impact**

I expect to be able to assess whether there has been a statistically significant change in accidents, injuries and fatalities since Vision Zero was put into effect so that I can assess whether it has been successful so far.

I don’t know if there will be data available to assess the individual initiatives or just the plan as a whole. If it’s possible to separate out the effects of different initiatives, then we can assess which of them are worthwhile for reducing fatalities and which aren’t.