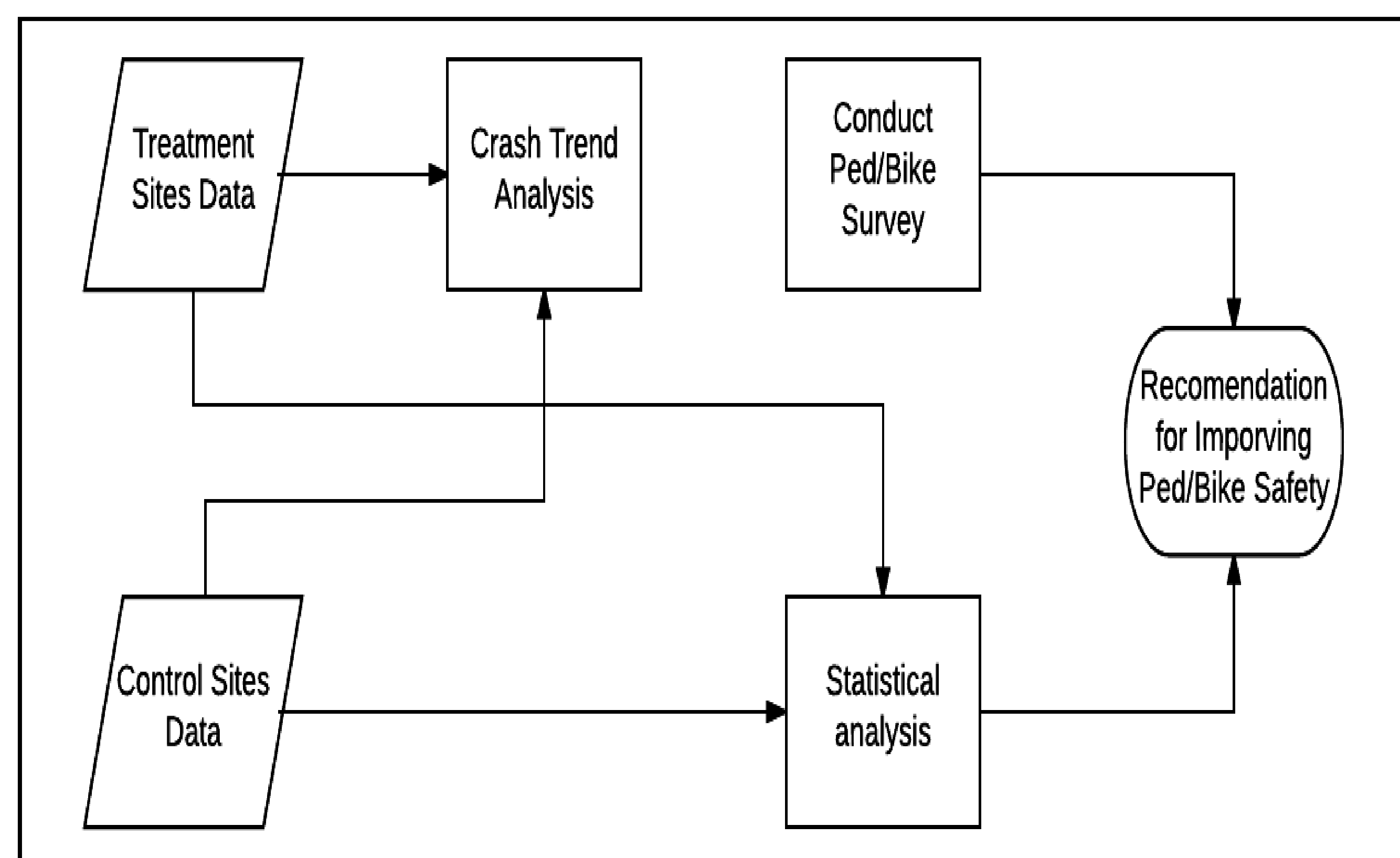


Analyzing the Impact of Median Treatments on Bicyclist/Pedestrian Safety

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Introduction

- ▶ Between 2005 and 2013, pedestrian fatalities constituted 19% of total traffic fatalities in Maryland. During these years, the pedestrian fatality rate per 10,000 walking commutes was on average 4% higher than the U.S. average
- ▶ SHA has identified 24 high-frequency bicycle/pedestrian crash sites through the Pedestrian Roadway Safety Audit (PRSA) Program.
- ▶ Median treatments were implemented at selected locations over the past 10 years.
- ▶ This study had the following objectives
- ▶ **1) To conduct a comprehensive scan of the best practices in addressing illegal mid-block crossings and enhancing bicycle/pedestrian safety;**
- ▶ **2) To assemble pedestrian and bicycle safety datasets at locations with recently installed median treatments in Maryland;**
- ▶ **3) To apply statistical methods to quantify the effectiveness of installed median treatments;**
- ▶ **4) To investigate human and socio-demographic factors of illegal mid-block crossing behavior**

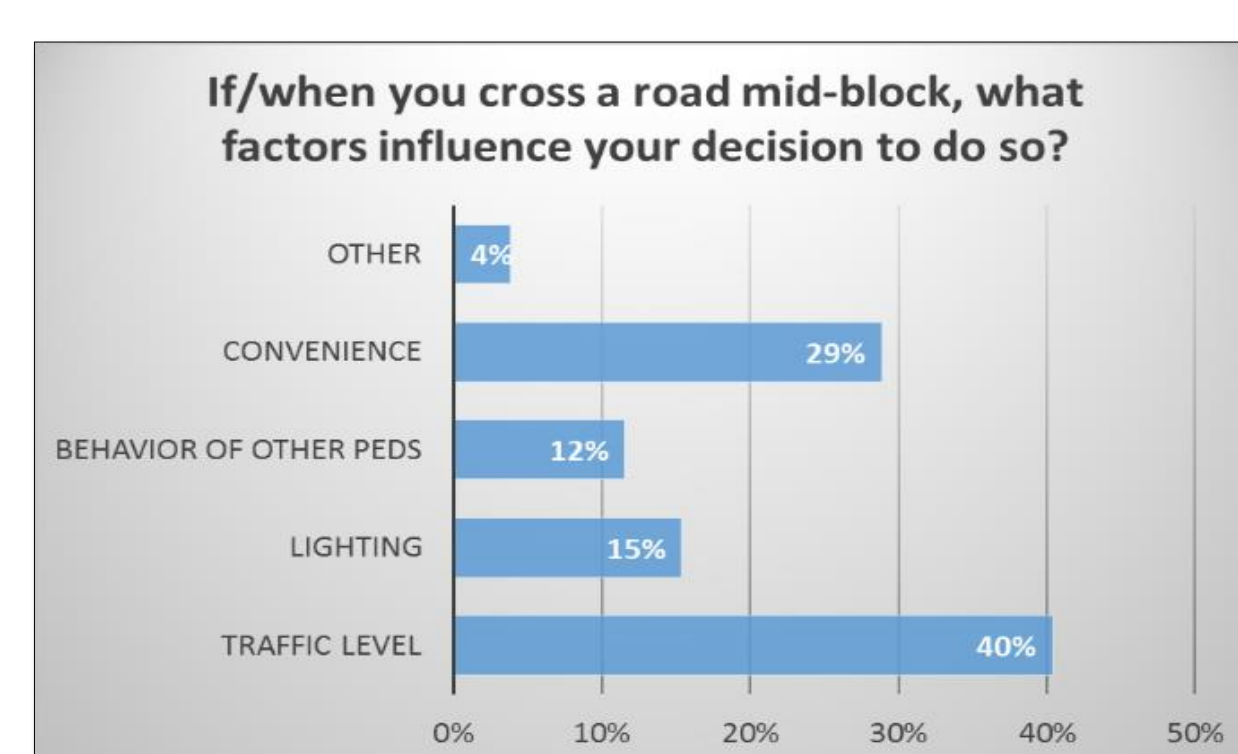
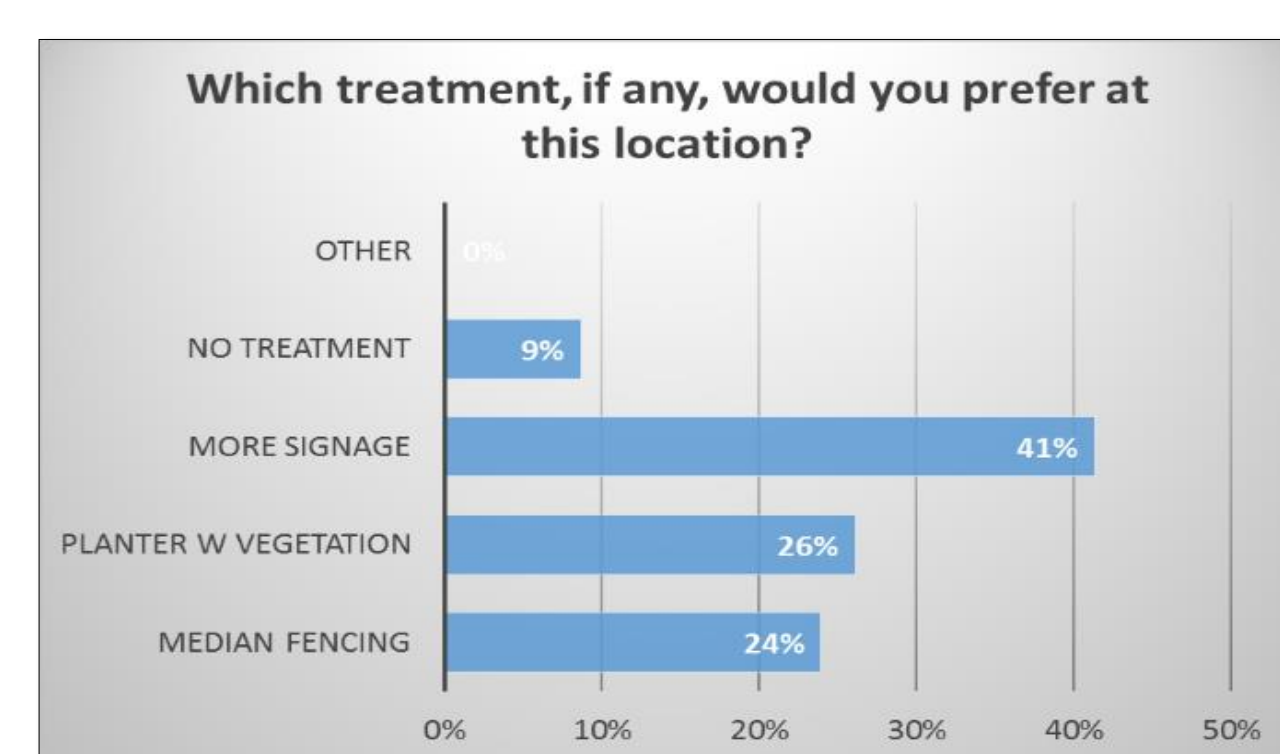
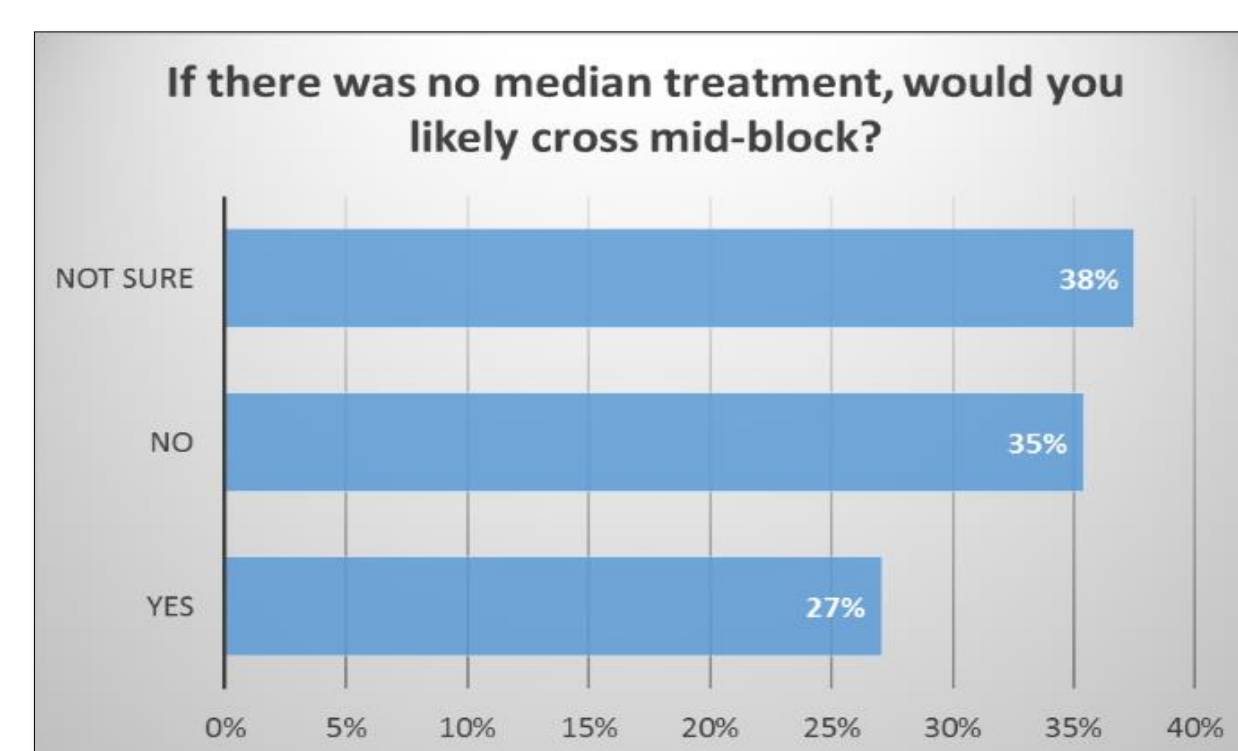
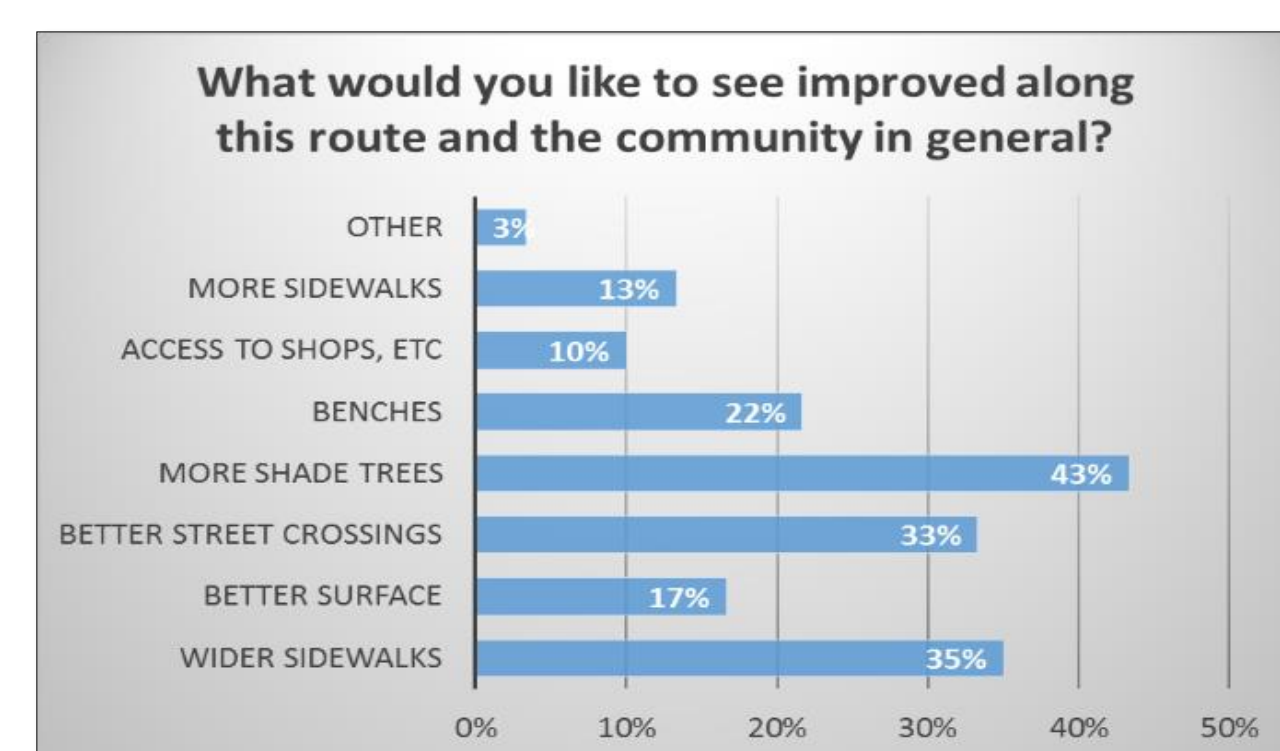


Data

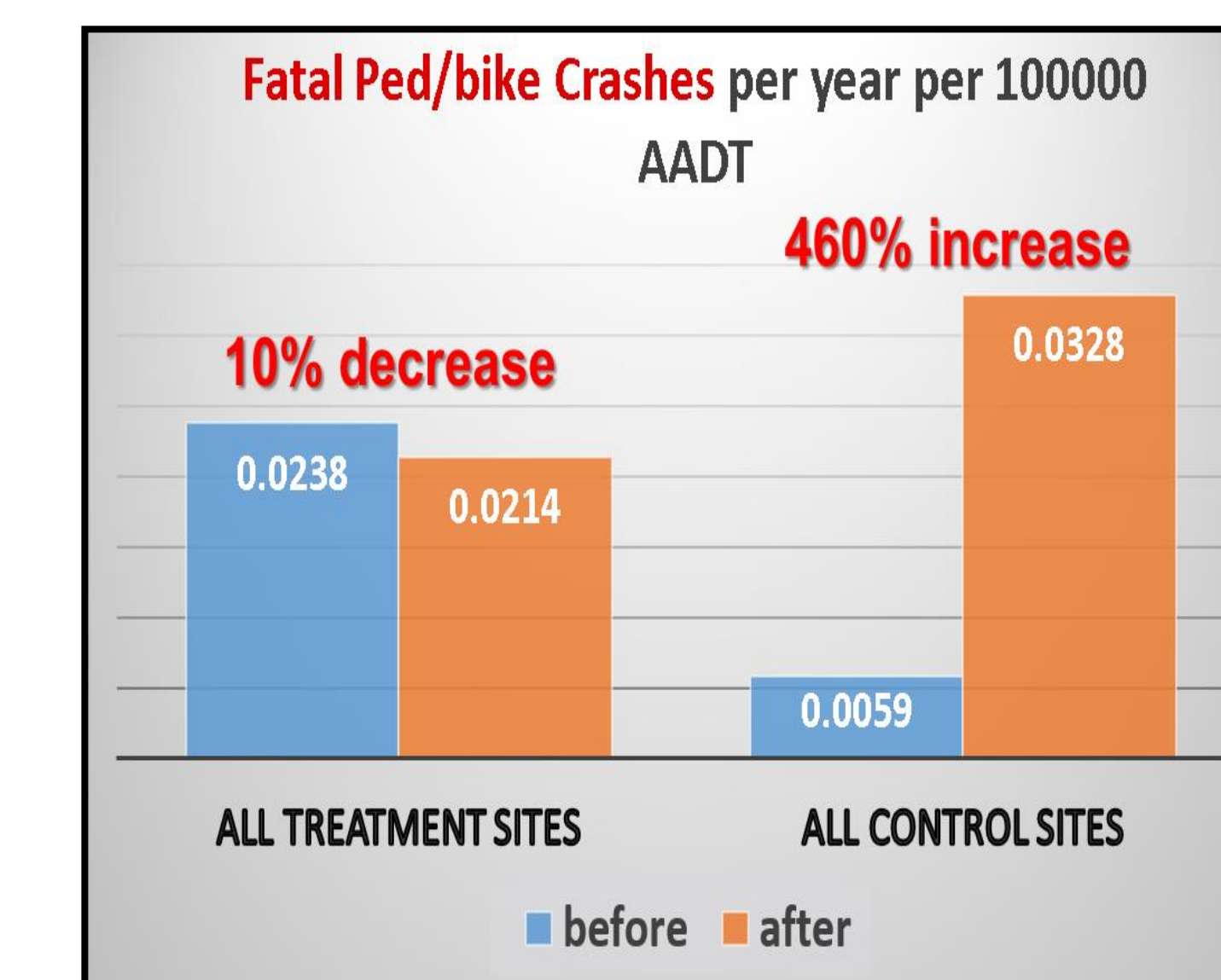
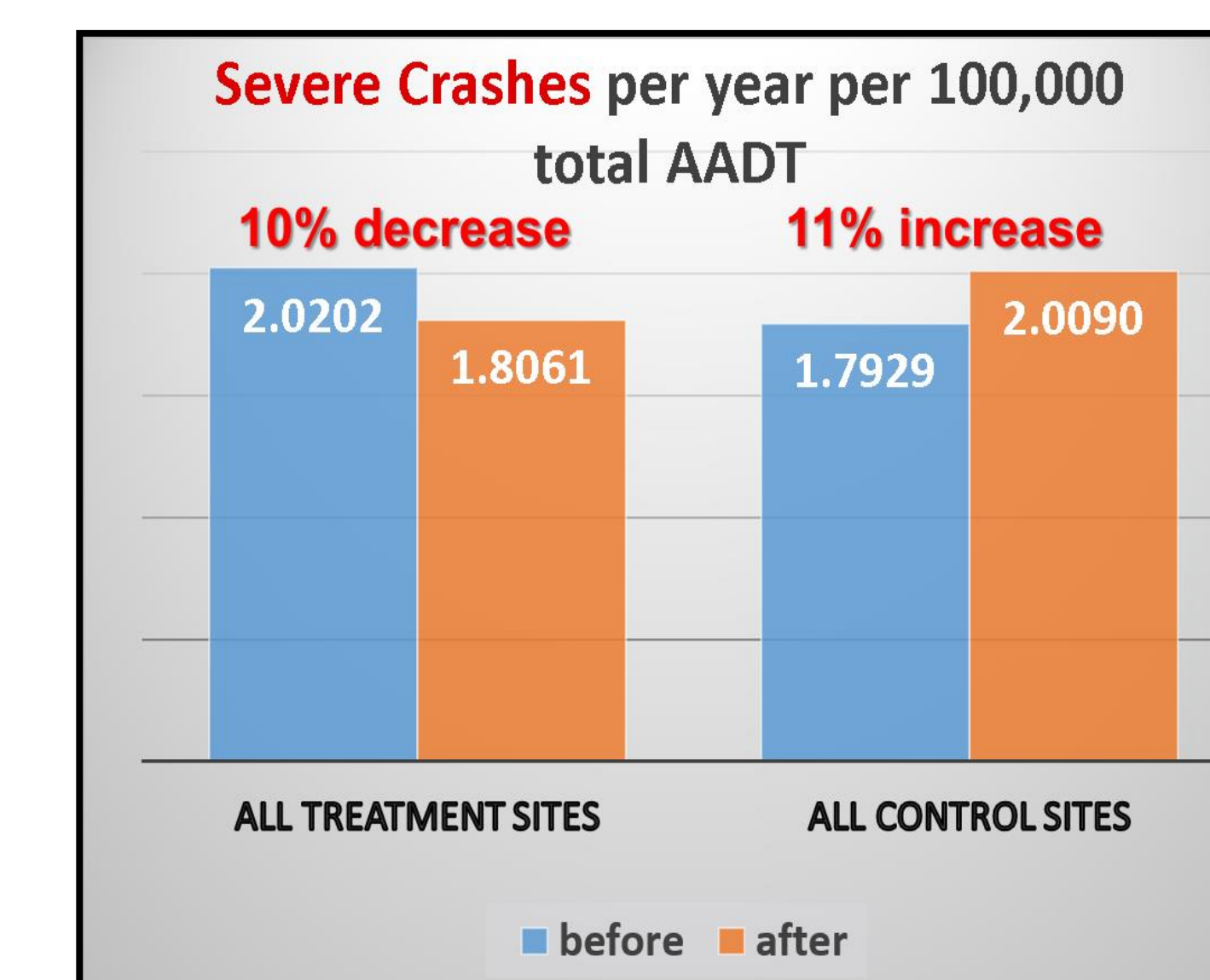
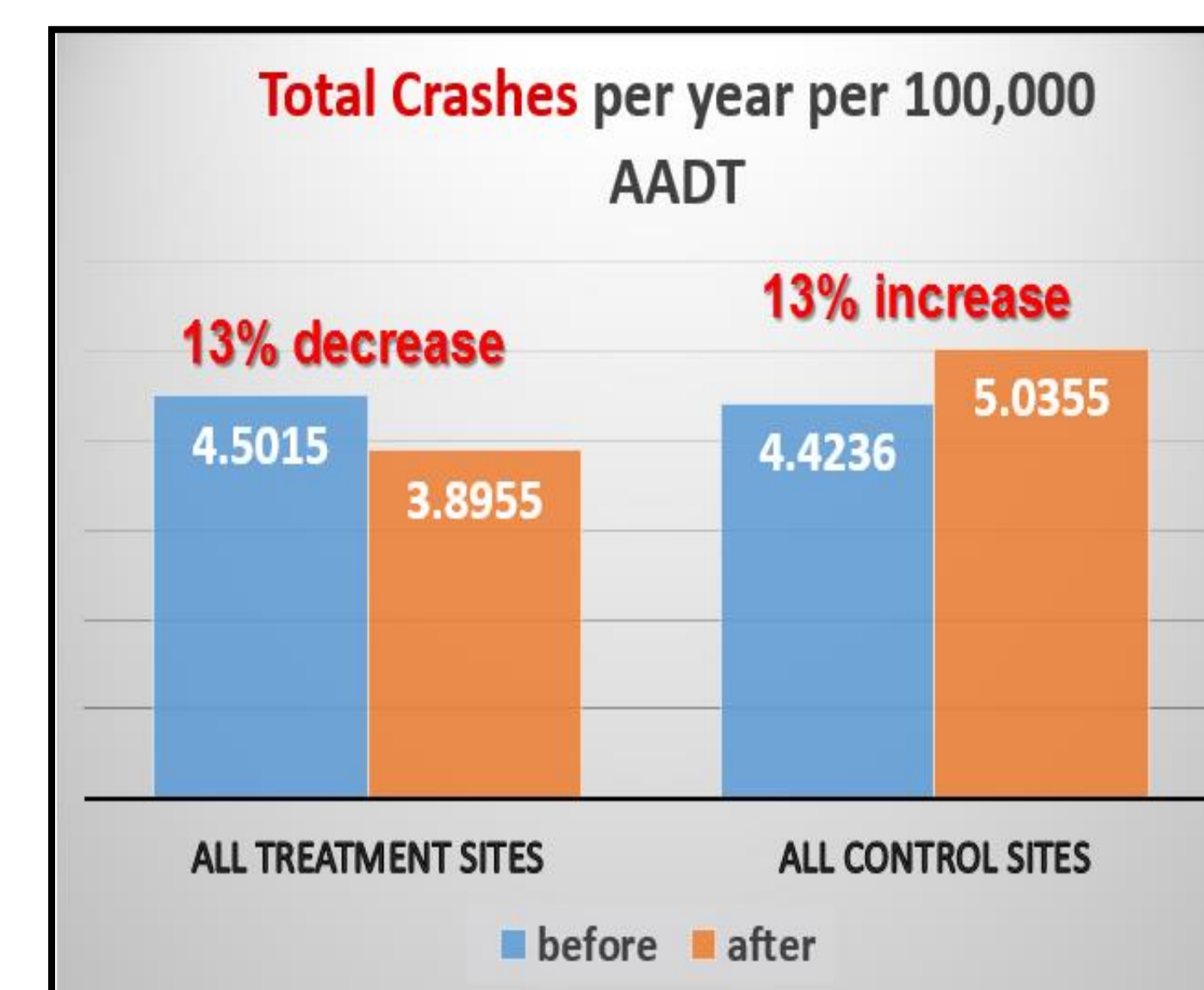
- ▶ Treatment Sites: 18 locations in Maryland with median treatments
- ▶ Control Sites: Immediately upstream or downstream of the corresponding treatment sites
- ▶ Crash data including: Total Crashes, Severe Crashes, Pedestrian/Bicyclist Crashes, Pedestrian/Bicyclist Fatal Crashes
- ▶ Annual average daily traffic (AADT), pedestrian/bicyclist counts, and design characteristics were among the datasets that were collected

Survey

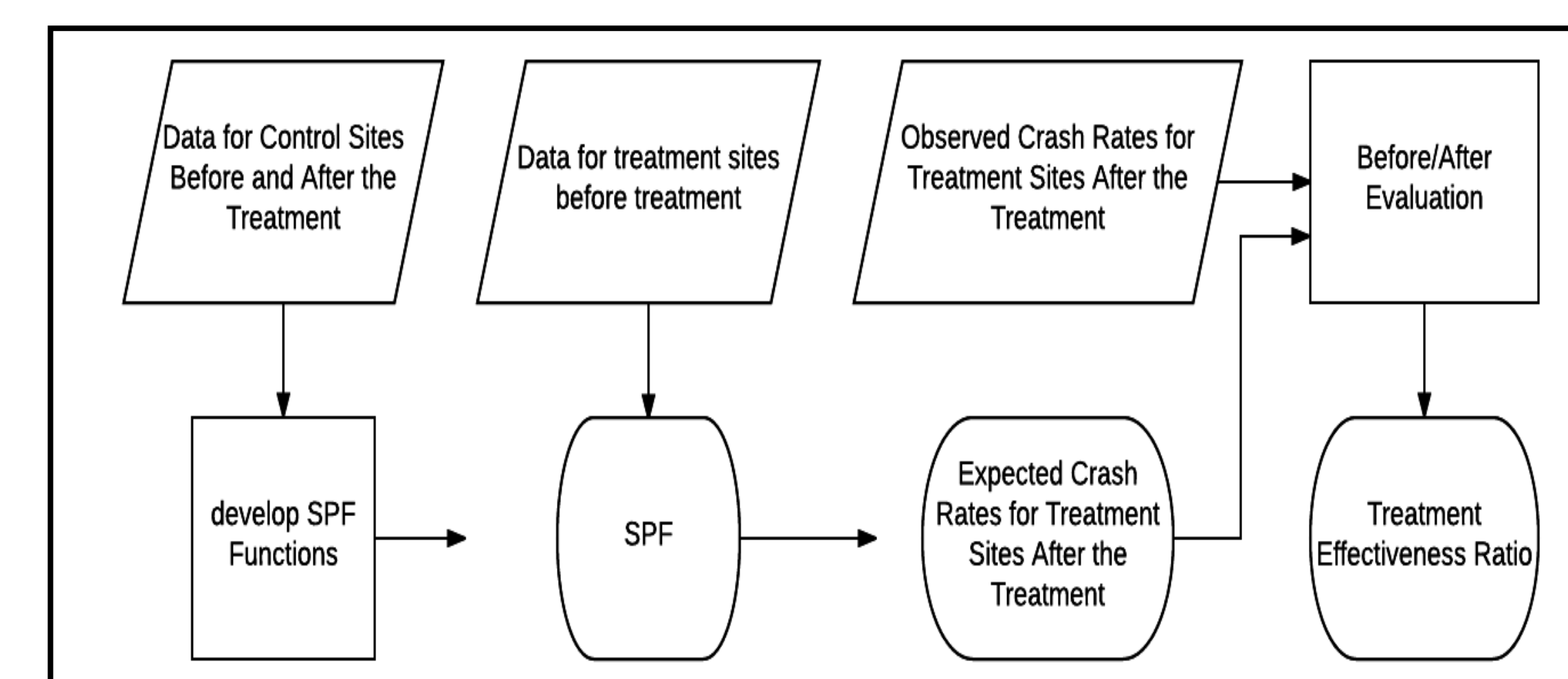
- ▶ The research team designed three different surveys for pedestrians, bicyclists, and local business owners, and conducted the surveys at all treatment sites during September and October of 2016.
- ▶ A total of 63 responses from pedestrians/bicyclists were collected during the site visits



Trend Analysis



Statistical Modeling Results



Parameters	Total Crashes	Severe Crashes	Ped/Bike Crashes	Fatal Ped/Bike Crashes
L: Number of crashes actually observed during the period after the treatment is installed	784	360	56	4
π : Predicted number of crashes during the after period, had the treatments not been installed	906	393	49	28
Estimated number of crashes reduced or lives saved	122	33	-7	24
θ : Estimated index of effectiveness	0.86	0.91	1.12	0.14
se(θ), Standard error of (θ)	0.04	0.06*	0.18*	0.07

- ▶ The Empirical Bayes (EB) method was found to be the most appropriate method for a before/after treatment effectiveness analysis
- ▶ The EB method estimates the expected number of crashes at a treatment site had the treatment not been installed, and compares the number with the actual observed number of crashes
- ▶ SPF development is a type of regression modeling to predict the number of crashes
- ▶ Independent variables for SPF: AADT, pedestrian counts, pedestrian illegal crossings, bicycle counts, bicyclist illegal crossings, speed limit, number of lanes, lane width, and near-bars location

- ▶ The median treatments have reduced the number of total crashes by 122 (14%), the number of severe crashes by 33 (9%), and the number of fatal crashes by 24 (86%)

Acknowledgement

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