



The Impact of a Signalized Crosswalk on Crossing Behaviors in a Low-Income Minority Neighborhood

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PHYSICAL ACTIVITY



- **52%** of American adults and **29%** of American youth fail to meet the recommended minutes of weekly PA
- In Missouri, **35%** of adults and **15%** of youth report being physically **in-active**

(CDC, 2010, 2012; Ogden et al., 2010)

NEED FOR THE STUDY

- Access to physical active opportunities such as parks, and active pedestrian transportation has been shown to positively impact active lifestyle behaviors
- A lack of built environment features (e.g., sidewalks, crosswalks and traffic calming measures) as well as high-speed, high-volume streets negatively impacts active lifestyle behaviors
- These issues are particularly relevant for youth, who are more impacted by safety concerns
- Little research has focused on the impact of crosswalk improvements on pedestrian crossing behaviors





STUDY OBJECTIVES

- **Primary Objective:** To examine the impact of street crossing infrastructure modifications on resident and youth crossing behaviors
- **Secondary Objective:** To determine whether street crossing infrastructure modifications calms traffic

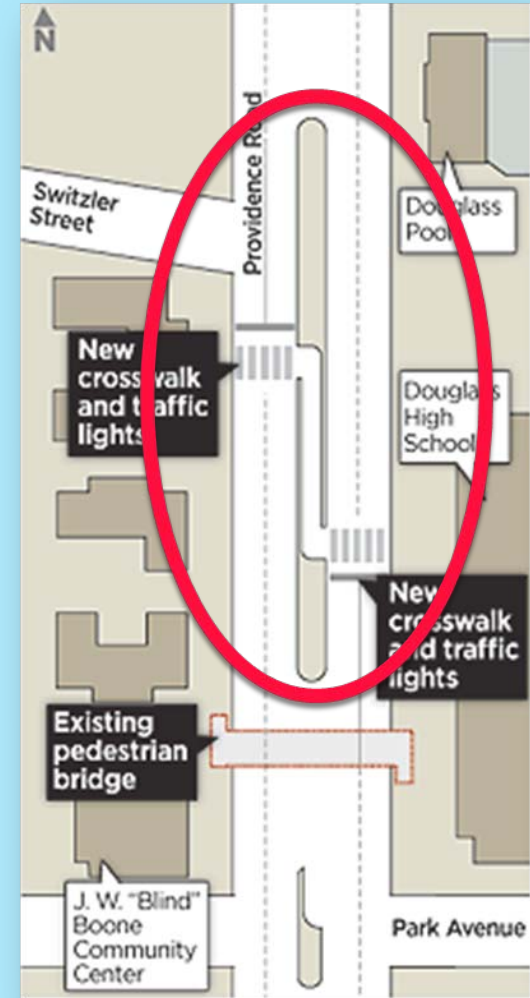
A NATURAL EXPERIMENT



- **Columbia, Missouri**
- **Installation of a signalized pedestrian crosswalk system**
 - 400-foot long landscaped median
- **Removal of pedestrian bridge**
 - Fears about crime and personal safety
 - Poorly designed (non-ADA compliant)

ACCESS AND SAFETY

- **Pedestrian Safe Access**
 - Limited neighborhood access to the park, high school and downtown district
- **Traffic Concerns**
 - Up to 23,000 vehicles per day
 - Maximum speeds of 60-70 miles per hour
 - Pedestrians often move between traffic



(City of Columbia, 2010)

ACCESS AND SAFETY

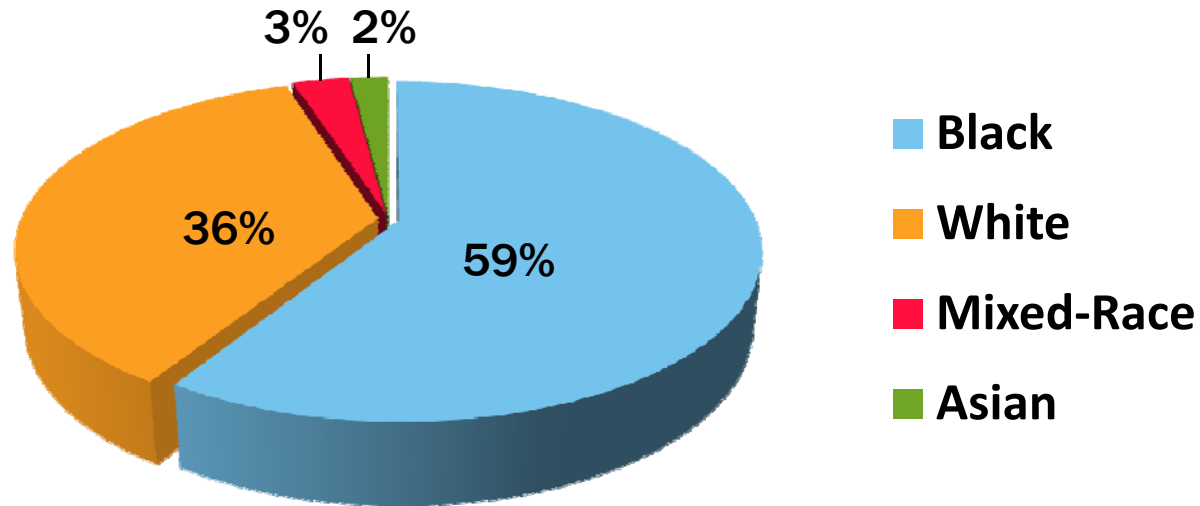


INTERVENTION POPULATION

■ Neighborhood Population

- 57% of families live below poverty level
- Median household income \$8,359 per year

Race/Ethnicity



METHODS

■ Intervention Timeline

- Baseline data collection June 2012
- Intervention construction winter/spring 2013
- Post-intervention data collection June 2013

■ Control Site

- Neighborhood
(e.g., size, income level, demographic profile)
- Corresponding street
(e.g., number of lanes, typical traffic volumes/speeds, pedestrian crossing facilities)



METHODS - TRAFFIC



■ Data Collection

- Nu-metrics Hi-Star traffic detectors embedded into the four travel lanes at both the Intervention site and the Control site
- 7 consecutive days during study period
- Recorded the speed of every vehicle and stored speed and volume data in one-hour time bins





DATA ANALYSIS

■ Crossing Data

- Checked for assumptions of normality
- Log transformation applied to counts
- ANCOVA
 - Dependent variable=Count
 - Independent variables=Year, Designated Zone, Site Location, & interactions
 - Control variable=Temperature
- Examined for both total counts and youth counts

■ Traffic Data

- χ^2 and Descriptive Statistics

OVERALL SITE COMPARISON

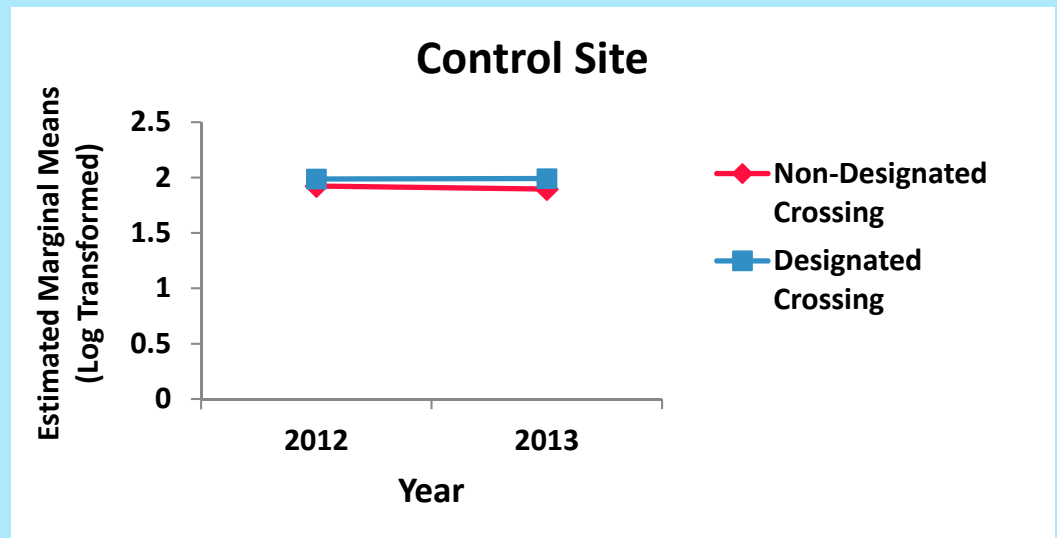
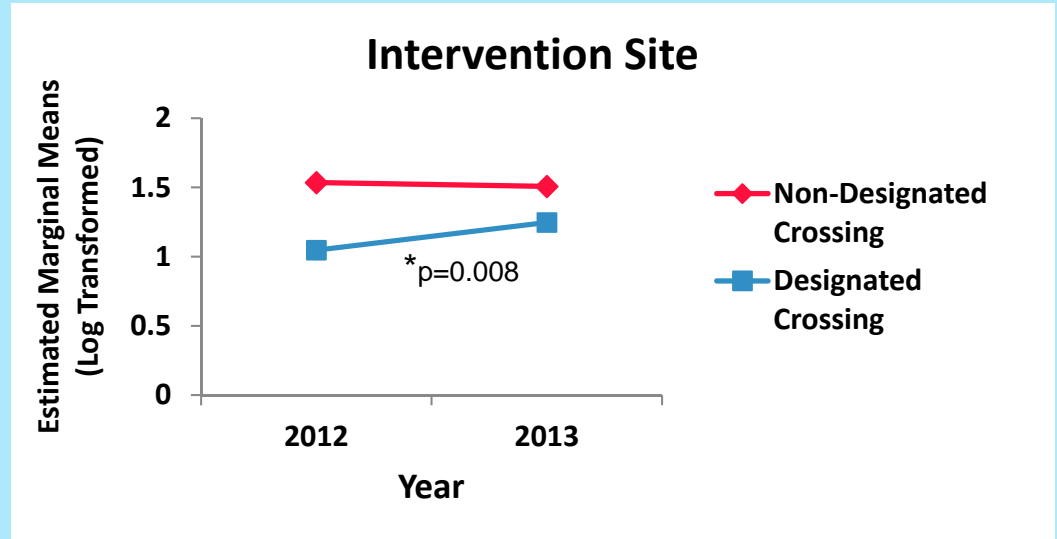
Site Location	2012	2013
Intervention	1,394	1,405
Control	4,324	4,060

3-way Interaction

- Year*SiteLocation*
DesignatedZone
 $p < 0.001$

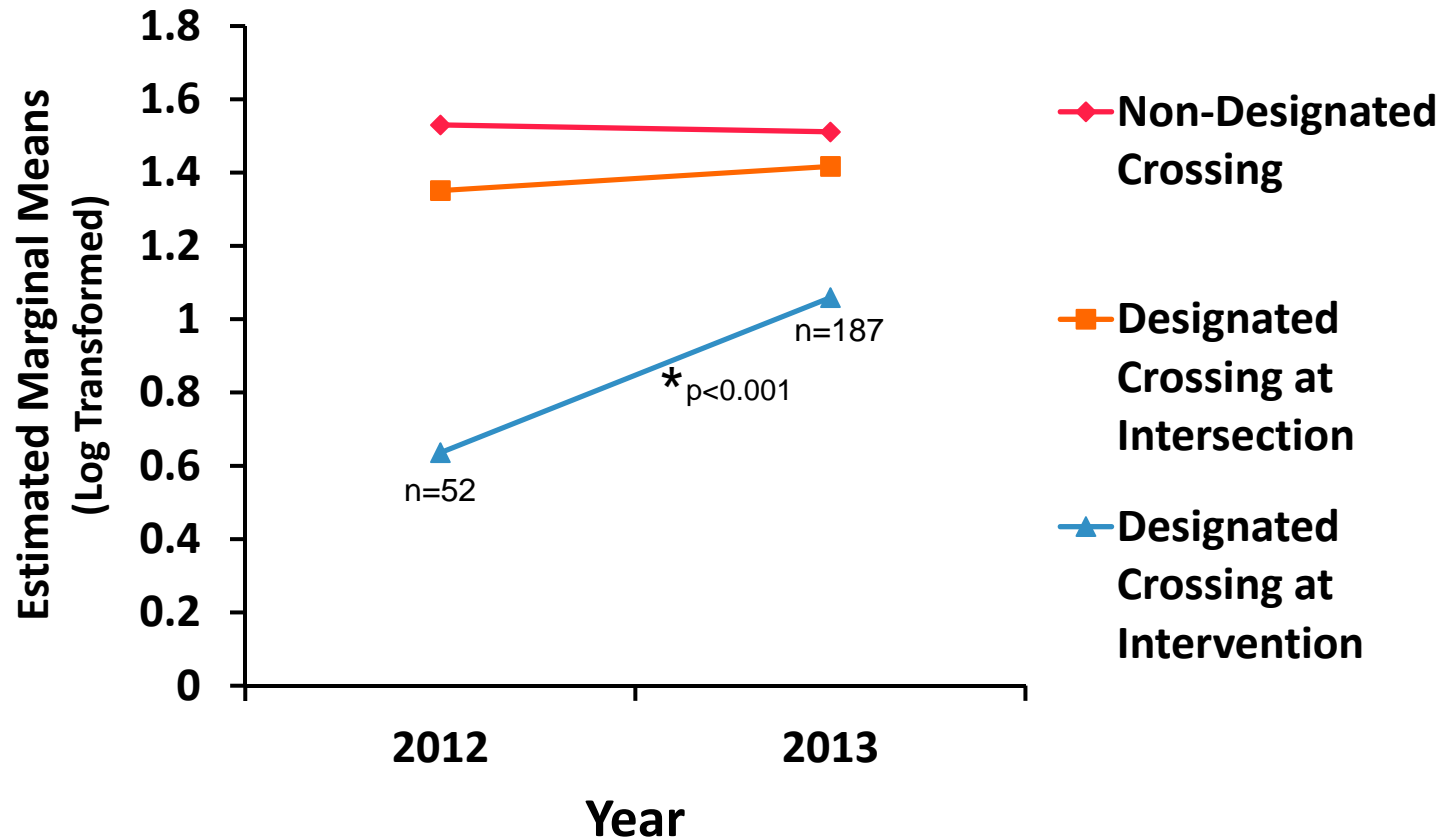
2-way Interaction by Site

- Year*DesignatedZone
- Intervention Site:**
 $p = 0.047$
- Control Site**
 $p = 0.783$



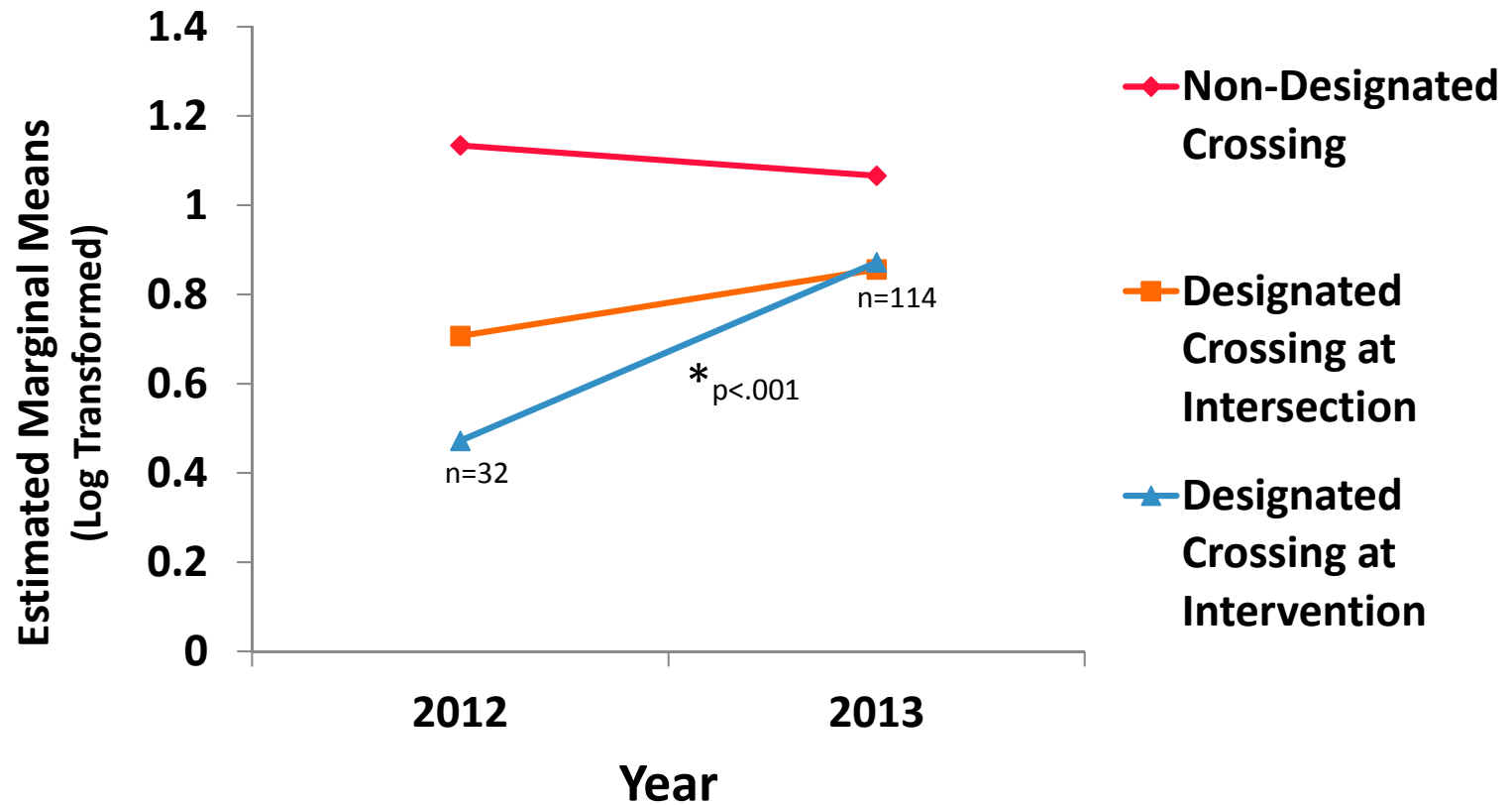
TOTAL COUNTS AT THE INTERVENTION SITE

Year*DesignatedZone p<0.001

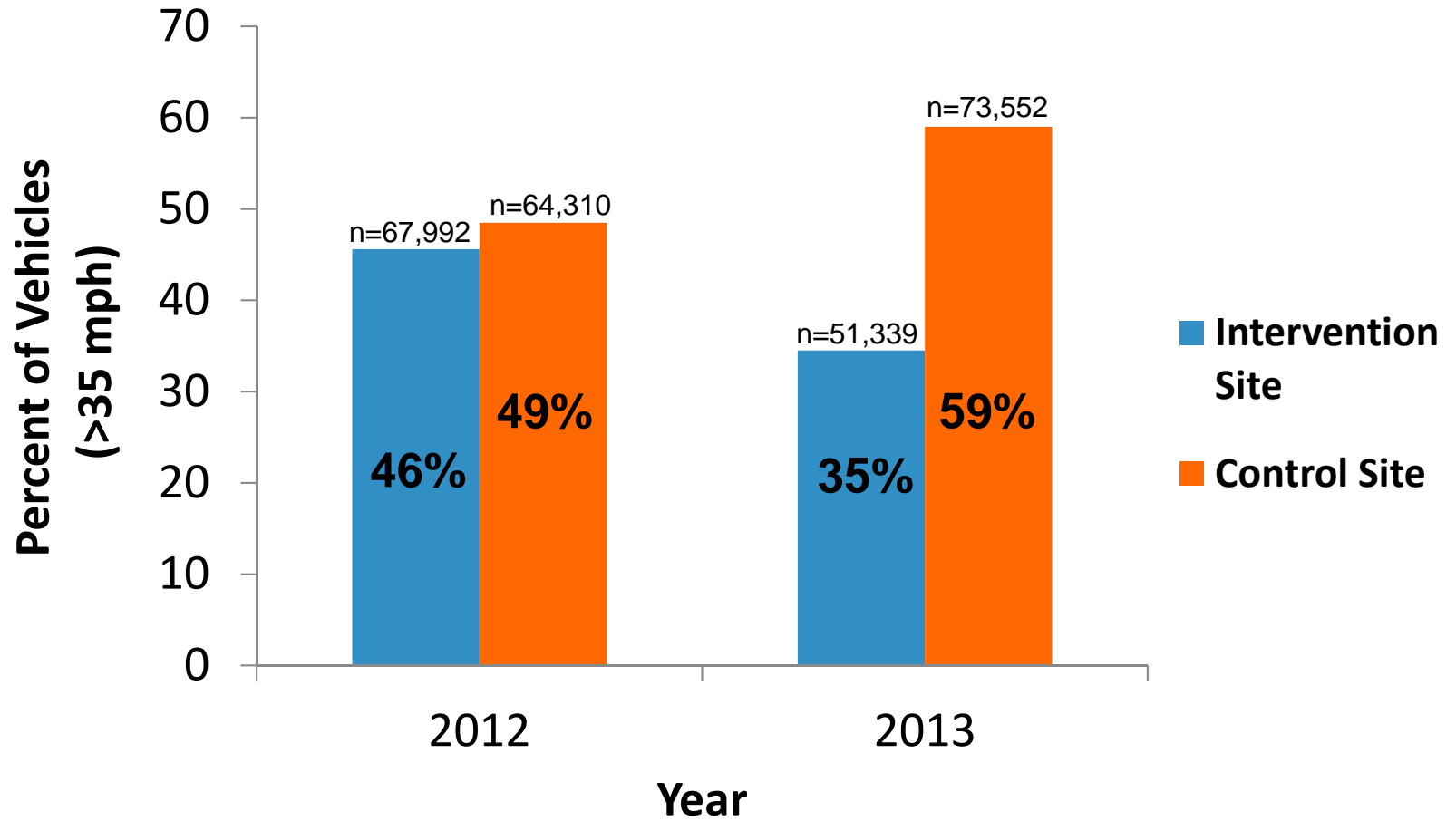


YOUTH COUNTS AT THE INTERVENTION SITE

Year*DesignatedZone p= 0.004



TRAFFIC DATA





MAJOR FINDINGS

- Designated crossings at the intervention site (bridge 2012; new crosswalk 2013) increased significantly for all residents and youth
- Non-designated crossings went down and designated crossings at intersections went up among all residents and youth, but these changes were not significant
- The percentage of vehicles speeding along the roadway with the newly installed crosswalk was reduced significantly

IMPLICATIONS OF STUDY FOR PRACTICE & POLICY

- Supports the feasibility of advocacy efforts to reverse transportation practices that favor automobiles at the expense of pedestrian accessibility
- Supports advocacy efforts seeking to modify the built environment to increase access and safety for active lifestyles, particularly among youth
- These findings are particularly important in underserved neighborhoods with outdated infrastructure that creates access issues





THANK YOU!

Questions?

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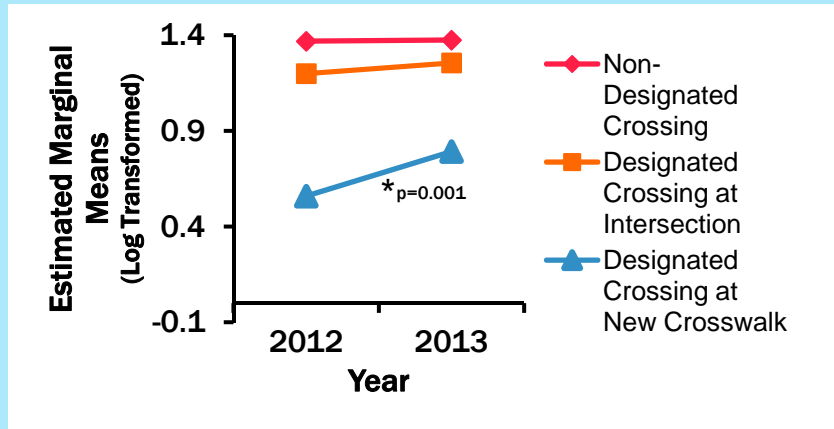
Special thanks to our partnering agencies:



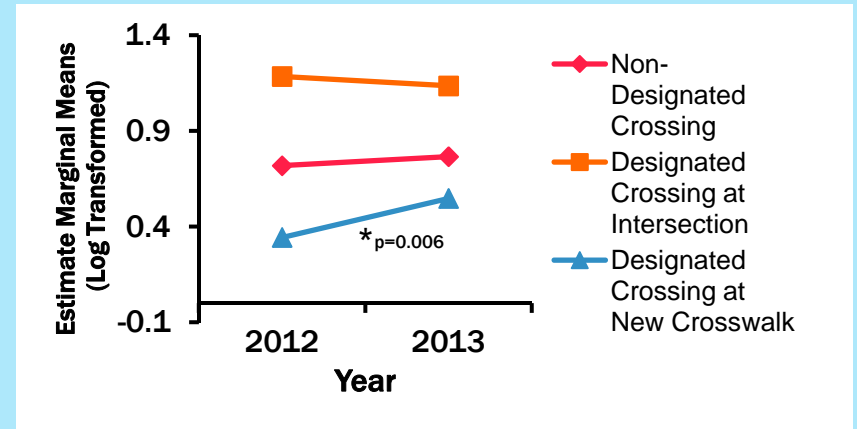
Douglass Park
Neighborhood
Association

INTERVENTION SITE COUNTS

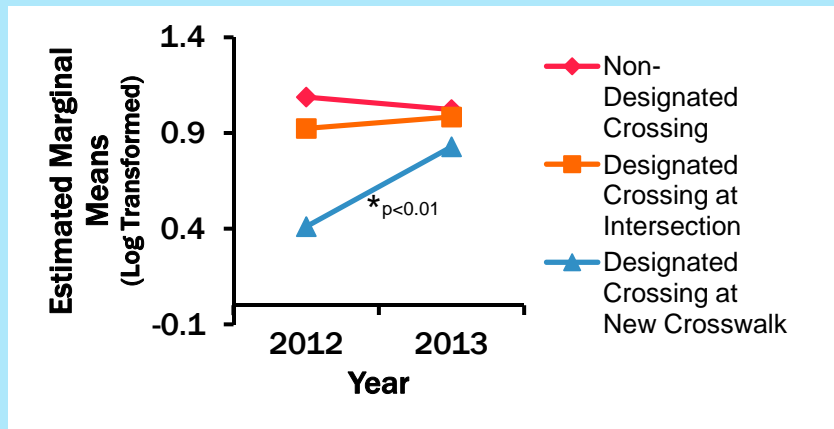
MALE



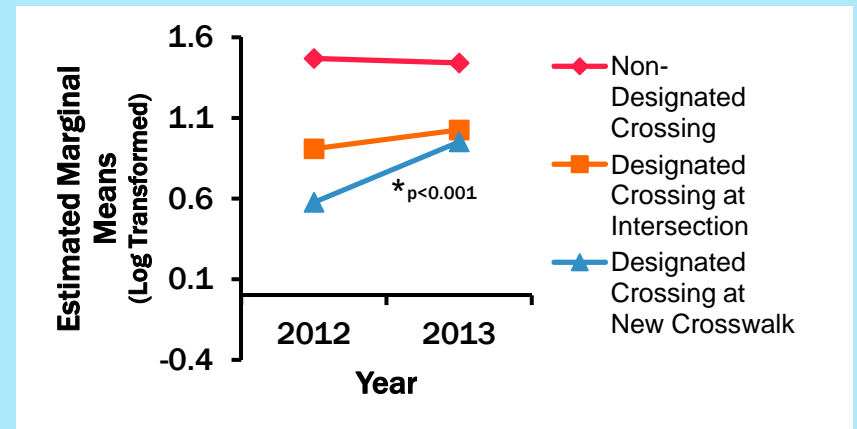
WHITE



FEMALE

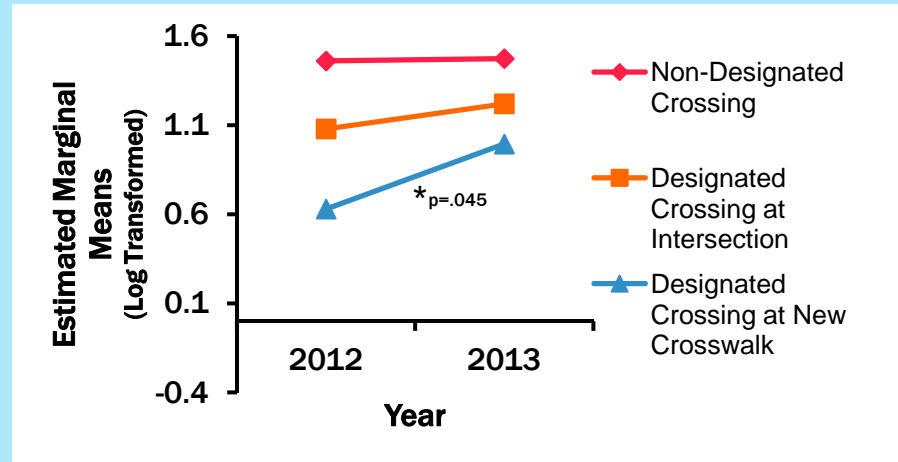


BLACK



INTERVENTION SITE COUNTS

PEDESTRIAN



BICYCLIST

