

Courtney Schultz, PhD

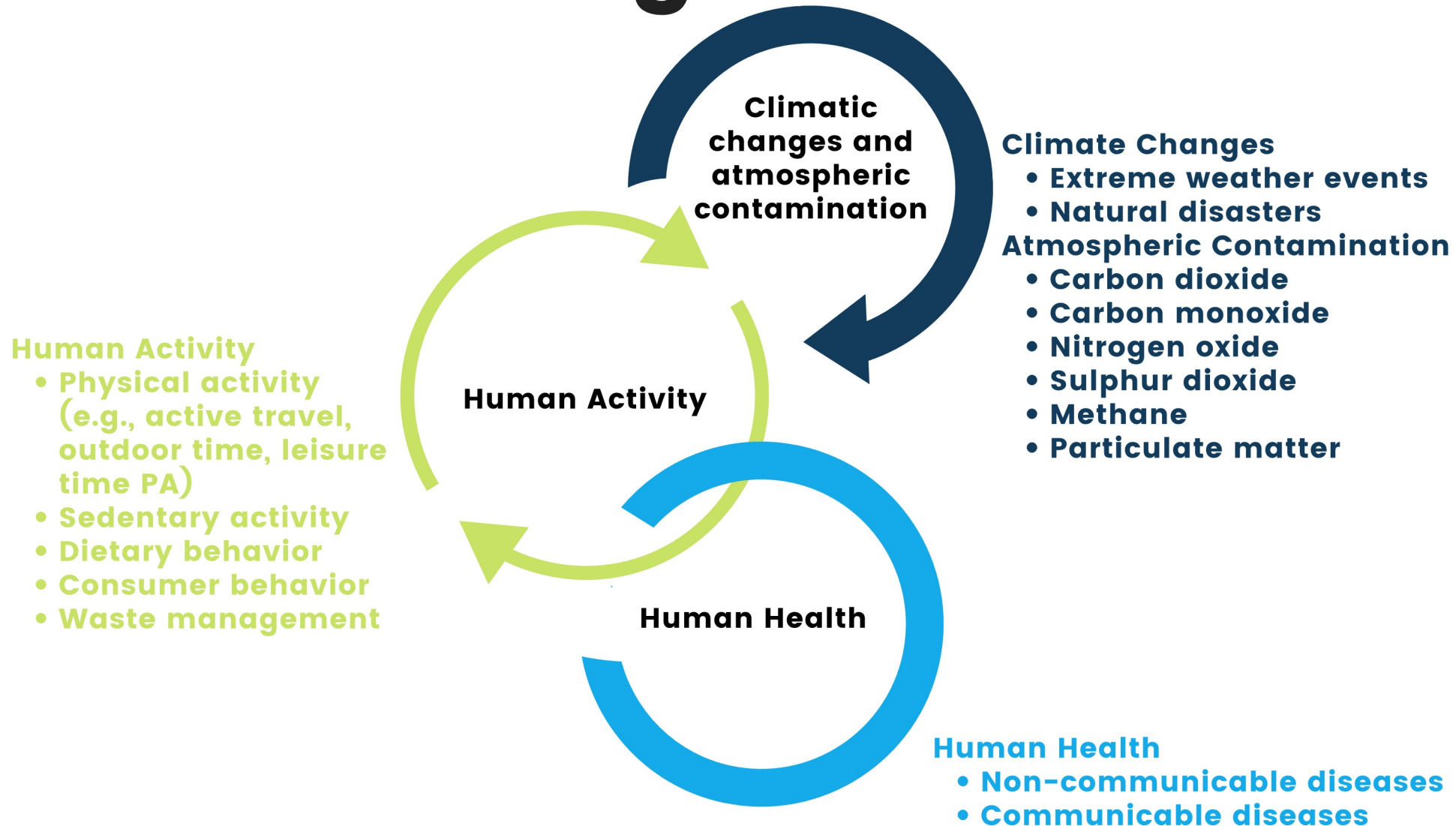
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Executive Director

Health & Technology Partners

# The Impact of a Signalized Crosswalk on Active Transportation Behaviors

# Climate Change





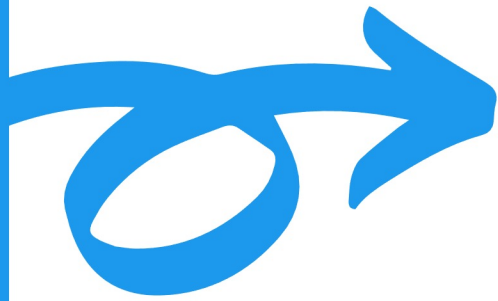
**ACTIVE LIVING  
THROUGH BUILT  
ENVIRONMENT**

Design elements in the built environment, such as street layout, land use, the location of recreation facilities, parks and public buildings and the transport system can either encourage or discourage physical activity. WHO, 2006

- Traffic calming measures and infrastructure improvements are shown to encourage active living behaviors
- Safe access to physical activity opportunities are positively linked to active behaviors



# Public Policy and Built Infrastructure



**EXAMINE THE IMPACT OF  
STREET CROSSING  
INFRASTRUCTURE  
MODIFICATIONS ON  
CROSSING BEHAVIORS  
AND TRAFFIC PATTERNS**

2012 TO 2015 NATURAL EXPERIMENT  
FIVE-LANE HIGH-SPEED ARTERIAL HIGHWAY

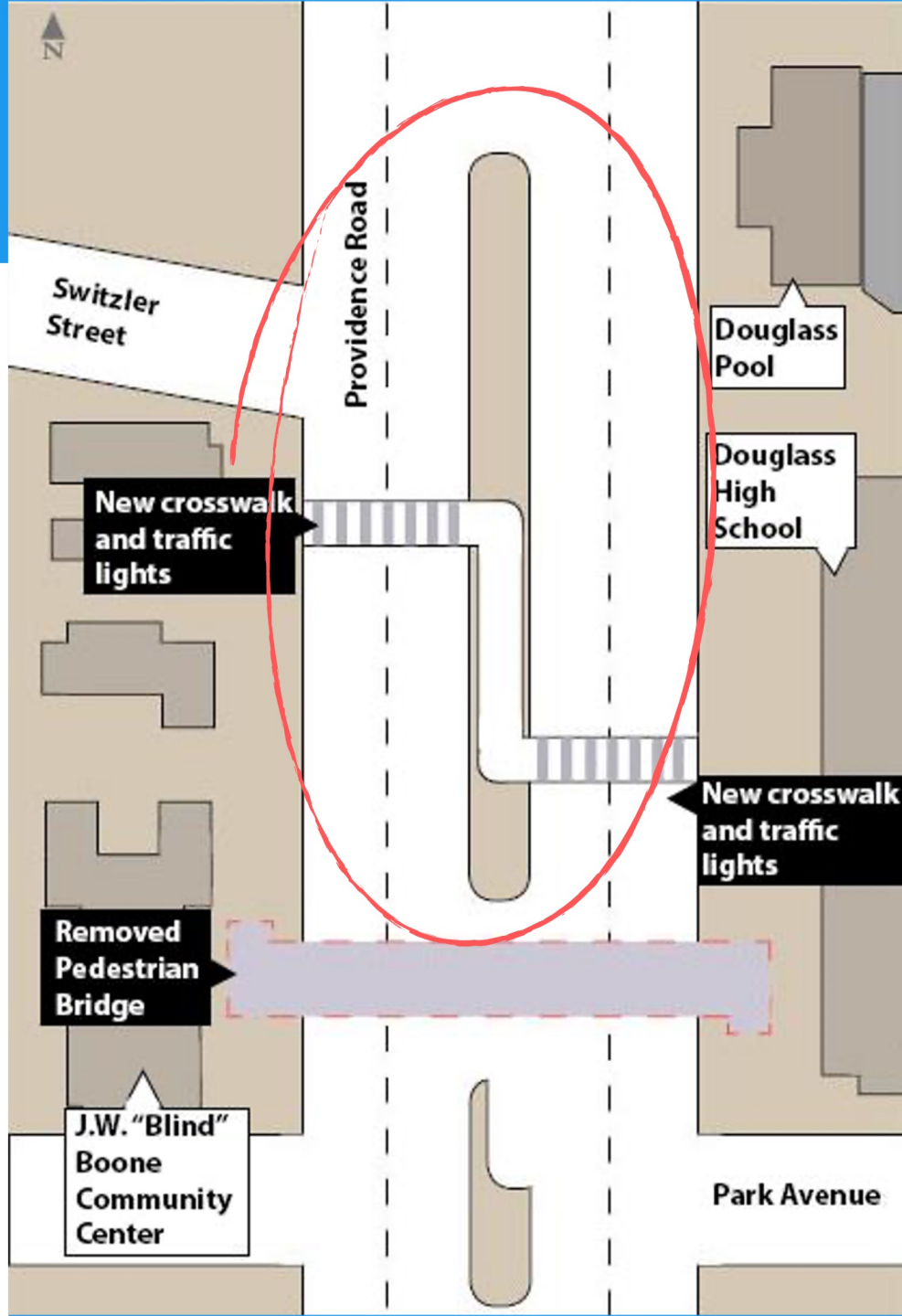


**CROSSING BEHAVIORS  
IN 2012 PRIOR TO THE  
INTERVENTION**



**CROSSING BEHAVIORS  
IN 2014 AFTER THE  
INTERVENTION**

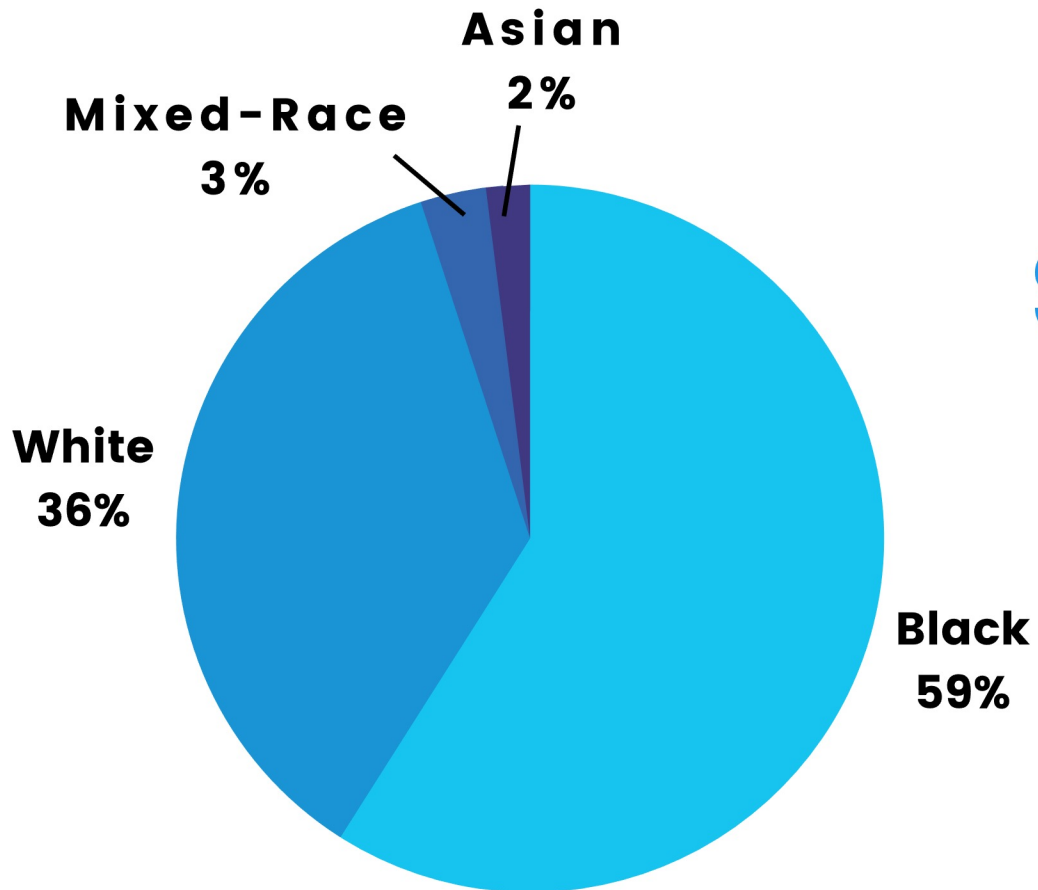




## BUILT ENVIRONMENT INTERVENTION

- Removal of pedestrian bridge
  - Poorly designed
  - Fears about crime and safety
- Installation of signalized pedestrian crosswalk system
  - 400ft-long landscaped median
- High Traffic Volume
  - Up to 23,000 vehicles per day
  - Maximum speeds 60-70 mph
  - Posted at 35 mph

# Neighborhood Population



**\$8,359**

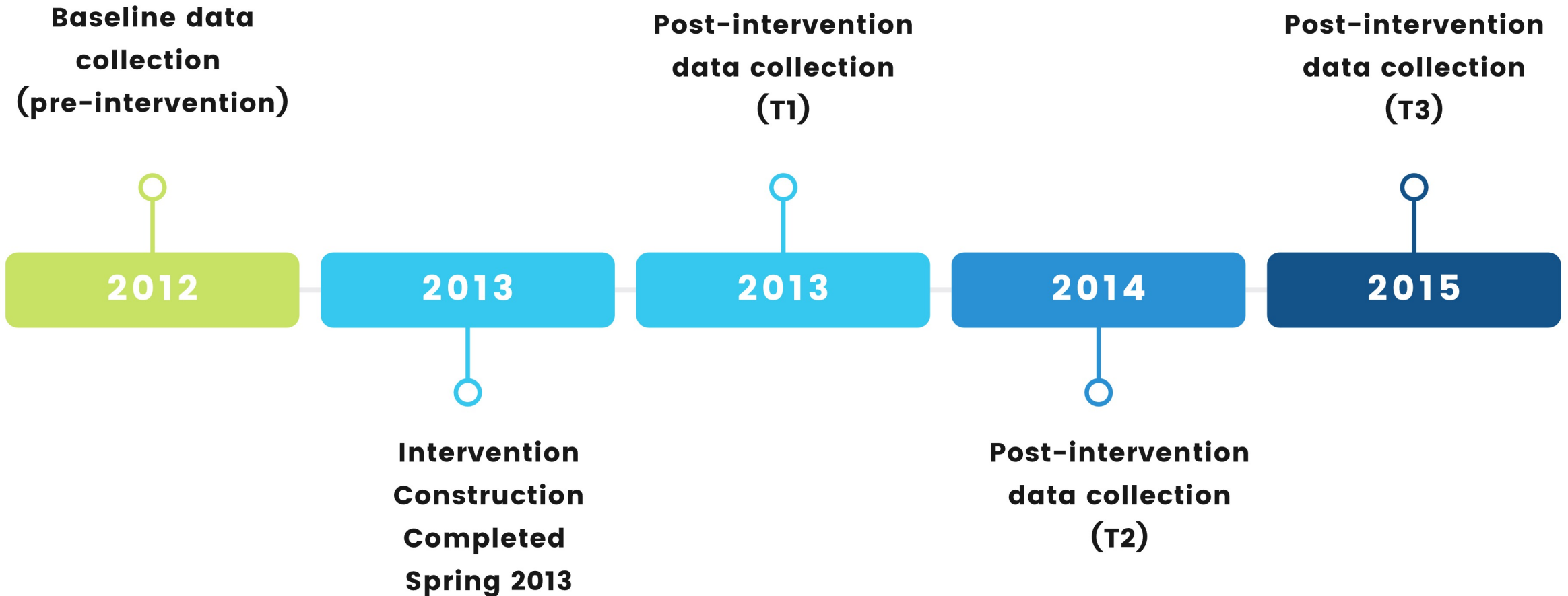
**median household  
income per year**

**57%**

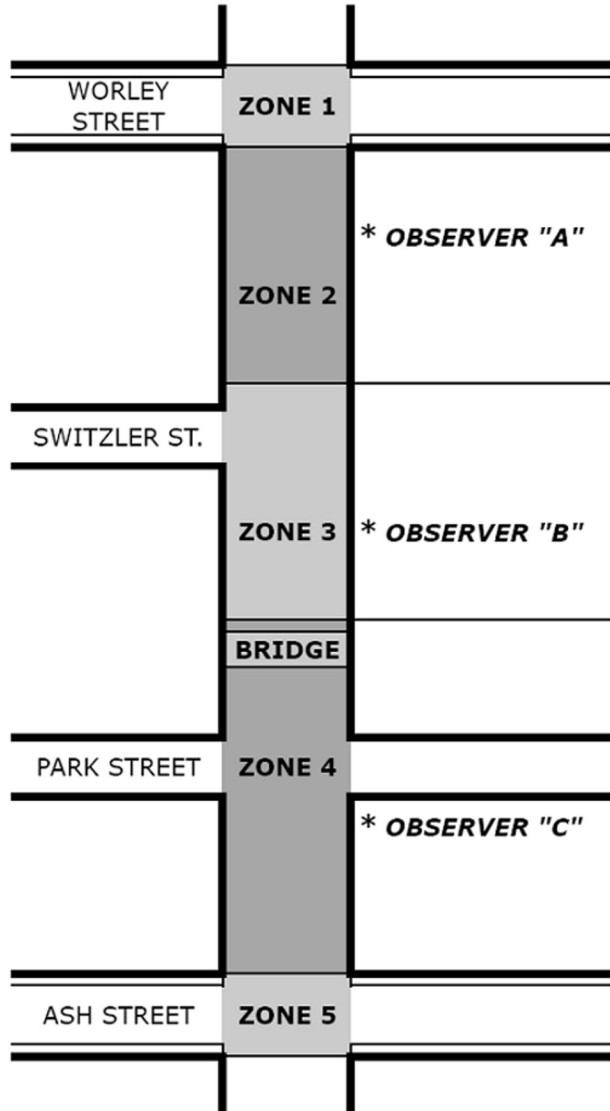
**of families live  
below poverty**



# Study Timeline



## INTERVENTION SITE: PROVIDENCE ROAD



## DATA COLLECTION

- Daily for two weeks in June (21 shifts per year)
  - 7:30-8:30a
  - 12:30-1:30p
  - 3:30-4:30p

## PEDESTRIAN DATA

- Direct observation in crossing zones
  - Non-designated
  - Designated at Intersections
  - Designated at Intervention Location (bridge & crosswalk)

## TRAFFIC DATA

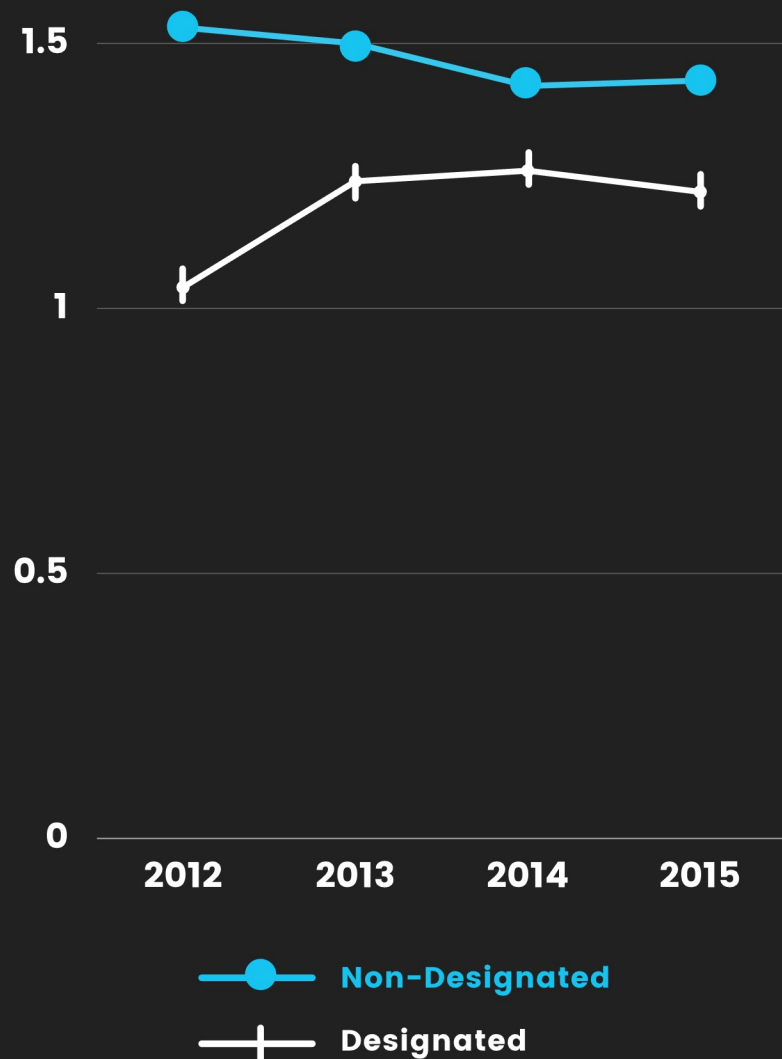
- Nu-metrics Hi-Star detectors
  - Embedded into 4 lanes of traffic
  - 7 consecutive days during 2012-2014
  - Recorded speed and volume

**What impact did  
the intervention  
have?**

**INCREASED  
PEDESTRIAN SAFETY**



## TOTAL COUNT LOG BY YEAR AND ZONE



# Pedestrian Crossings

Total pedestrian crossings did not significantly change from 2012 (n=1,408) to 2013 (n=1,352), 2014 (n=1,380) or 2015 (n=1,568)

There was a significant year\*designation zone interaction (p=0.036)

# Pairwise Comparison Crossing Type



## **INTERVENTION EFFECT**

Pairwise comparisons of the Designated Crossings indicated an overall increase from pre-intervention to each post-intervention in 2013, 2014 and 2015.



## **SUSTAINED EFFECT**

There were no significant changes between the post-intervention years for Designated Crossings (2013-2014,  $p=1.000$ ; 2013-2015,  $p=1.000$ ; 2014-2015,  $p=0.999$ ).



## **NON-DESIGNATED EFFECT**

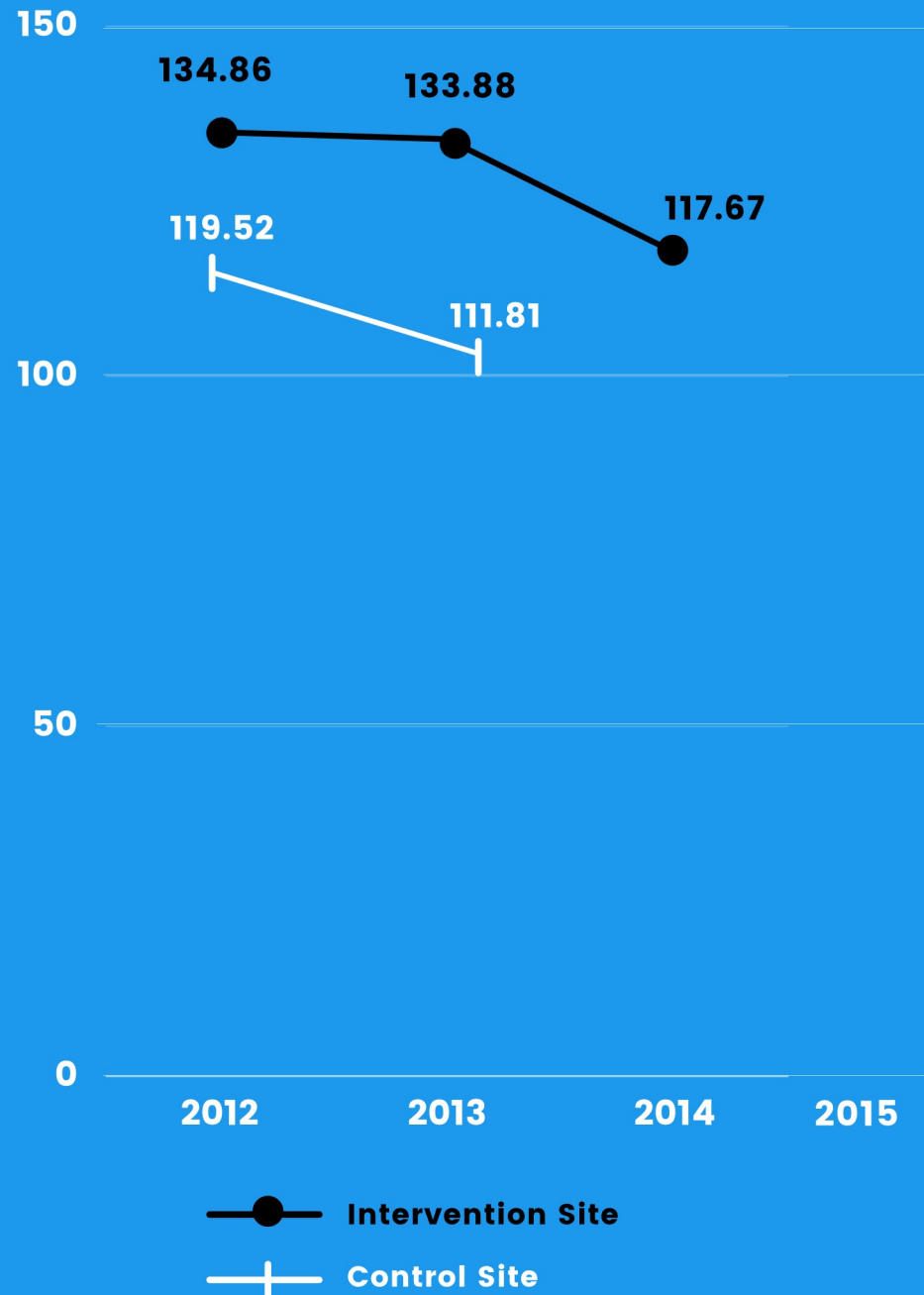
Non-Designated Crossings indicated no change from pre-intervention to post-intervention in 2013, 2014 or 2015.

# Traffic Volume

Significant reduction ( $p < 0.05$ )  
in total traffic volume  
pre-intervention to  
post-intervention at both  
intervention and control.

Unable to collect traffic data in 2015

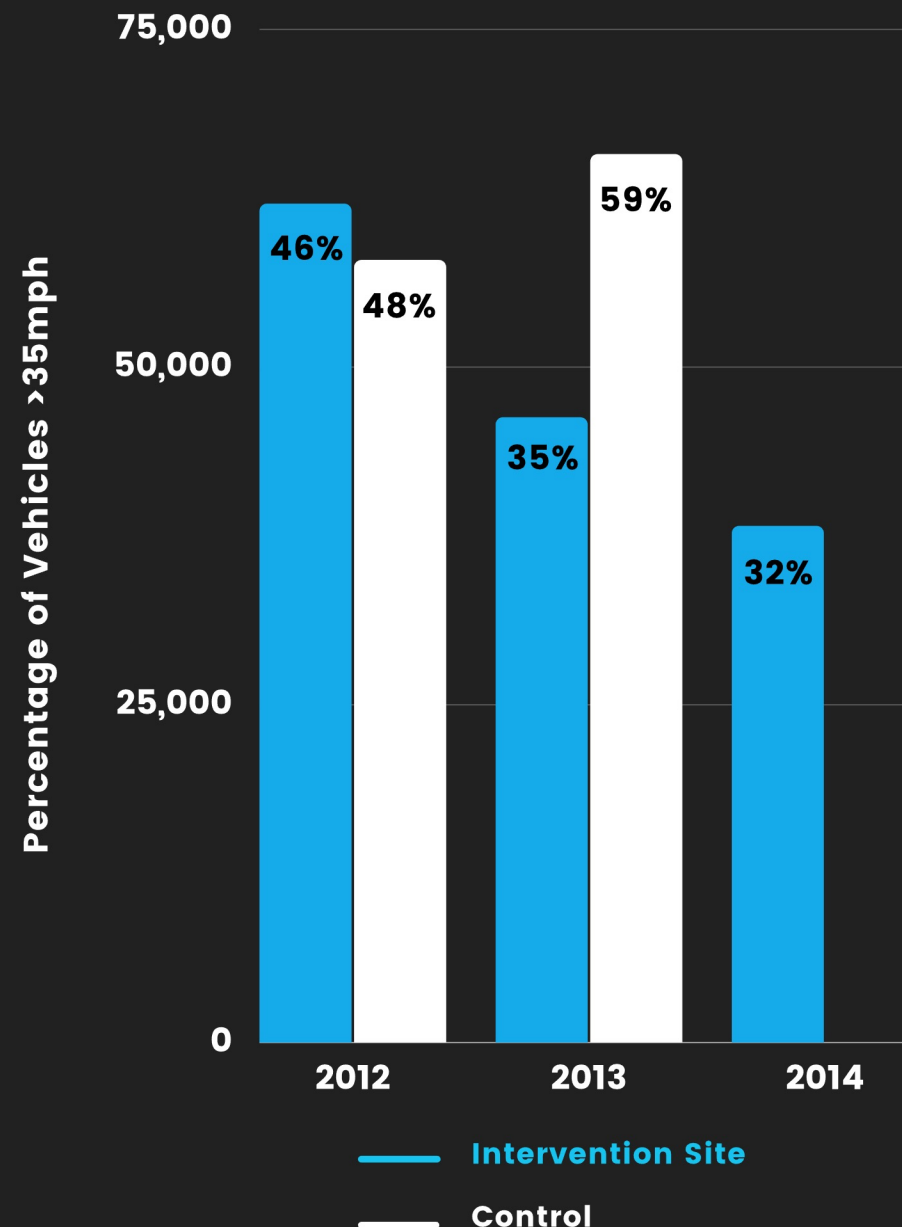
TRAFFIC VOLUME  
(IN THOUSANDS)



# Traffic Speed

A significant reduction in the number of vehicles exceeding the 35 mph speed limit.

Vehicles traveling more than 10 mph over the speed limit fell from 3.4 to 1.8 percent.





USE OF THE CROSSWALK  
BY LOCAL RESIDENTS AND  
ADOPTION OF HEALTHIER,  
MORE PHYSICALLY  
ACTIVE LIFESTYLES  
CONTINUED OVER THE  
FOUR YEAR STUDY.



# How does this connect to climate change and health?

## **INFRASTRUCTURE DESIGN CAN SUPPORT ACTIVE LIVING AND MOBILITY**

The design could help other communities decrease the hazards of crossing major streets and increasing mobility of pedestrians helping to lessen reliance on car transportation.





# Questions?

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