



The
VISION
ZERØ
Toolbox

*People-Driven Strategies for
Safer Philadelphia Streets*

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Anqi Li, Lufeng Lin, Kefan Long, Rongzhi Mai,
Ian Schwarzenberg, and Jonathan Yuan

Instructors: Marco Gorini and Greg Krykewycz

Photo Source: Visit Philadelphia

1997
Sweden



2000s
Europe



2014
New York City
San Francisco



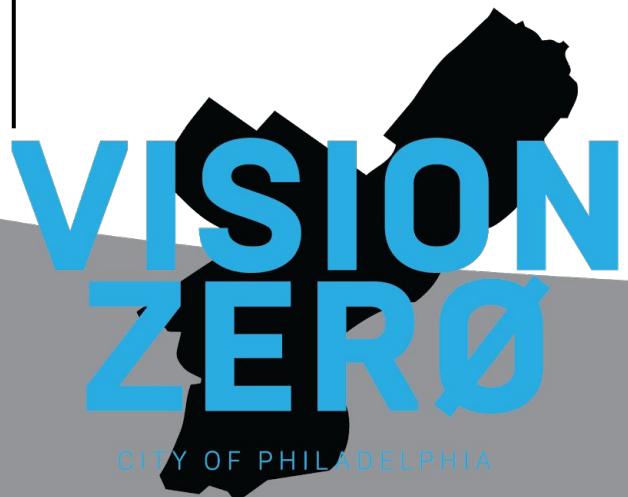
2015
Los Angeles



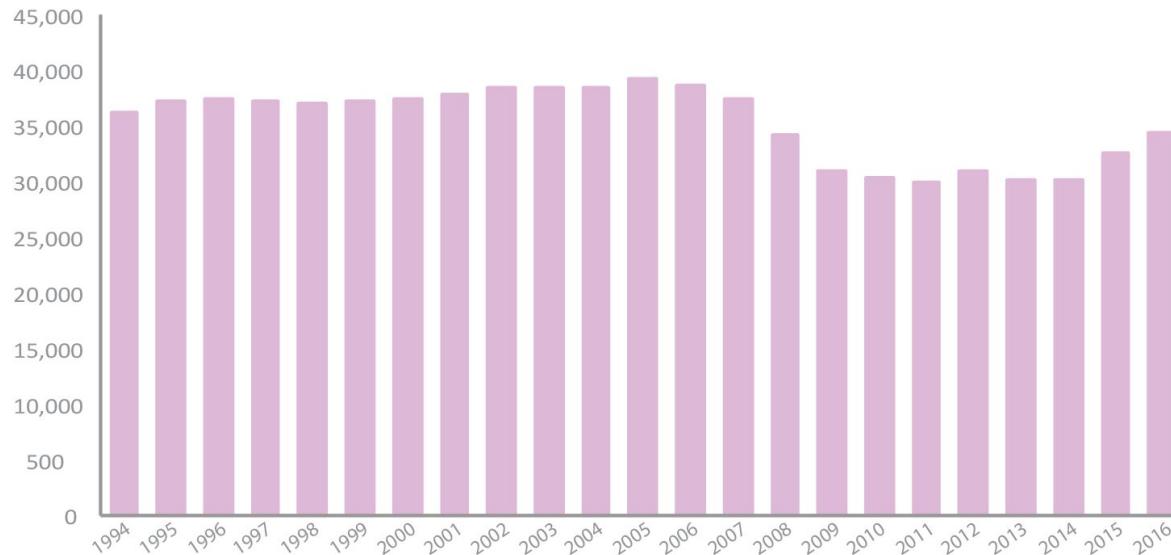
2016
Washington, D.C.



September 2017
Philadelphia



Nationwide Fatal Crashes, 1994-2016



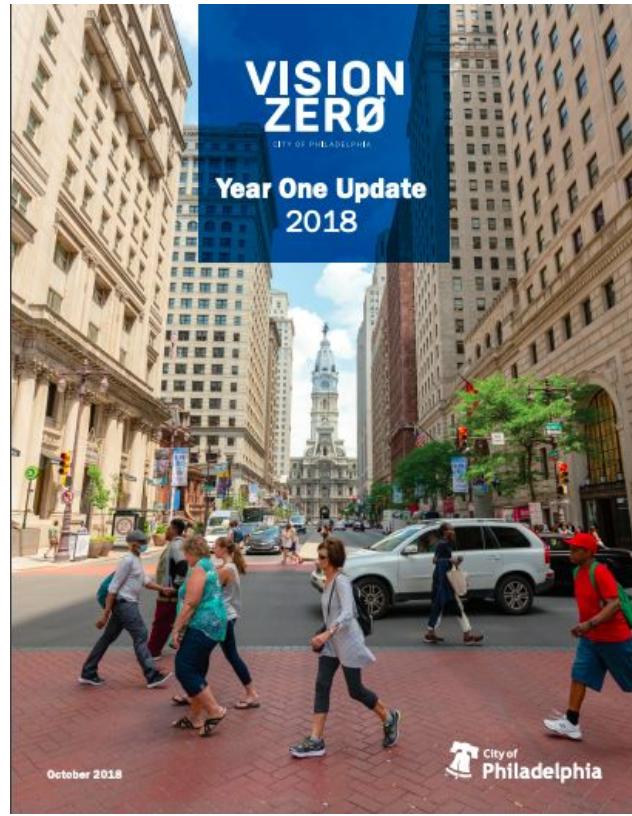
Source: National Highway Transportation Safety Administration, Fatality Analysis Reporting System (FARS) Encyclopedia

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Traffic deaths per 100,000 residents



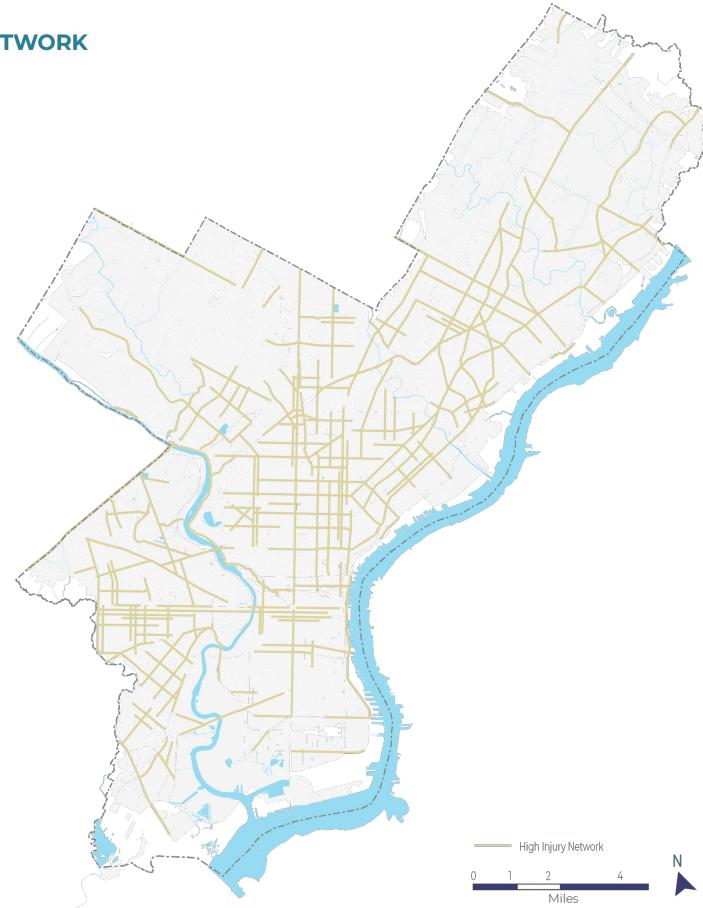
Source: Vision Zero Philadelphia, Office of Complete Streets, oTIS



Source: Vision Zero Philadelphia, Office of Complete Streets, oTIS

The High Injury Network

50 percent of killed and serious injury (KSI) crashes occurred on just **12 percent** of Philadelphia's road network.

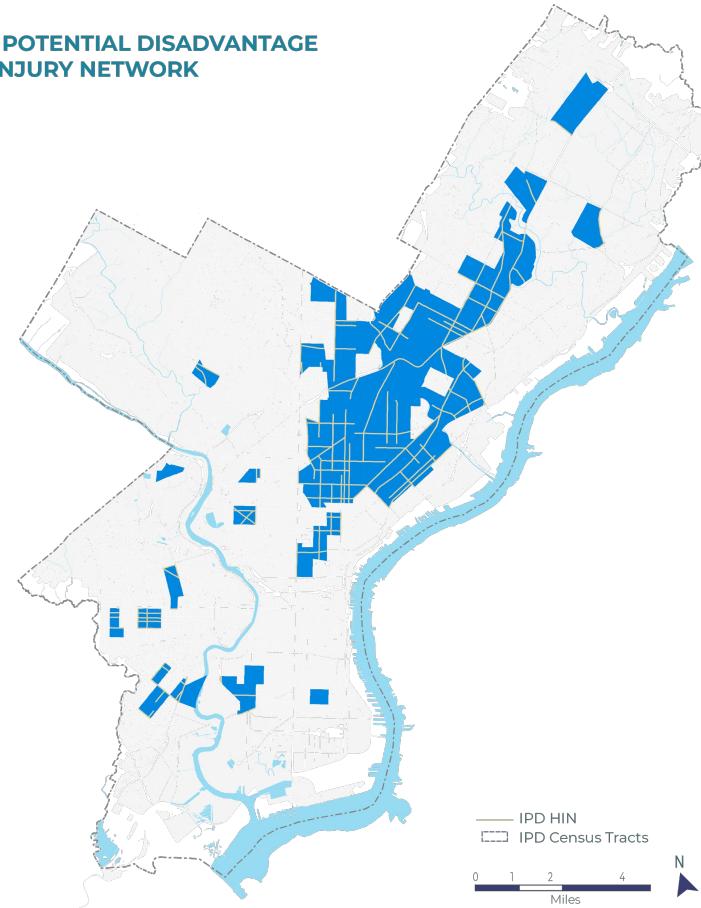


The High Injury Network

INDICATORS OF POTENTIAL DISADVANTAGE
AND THE HIGH INJURY NETWORK

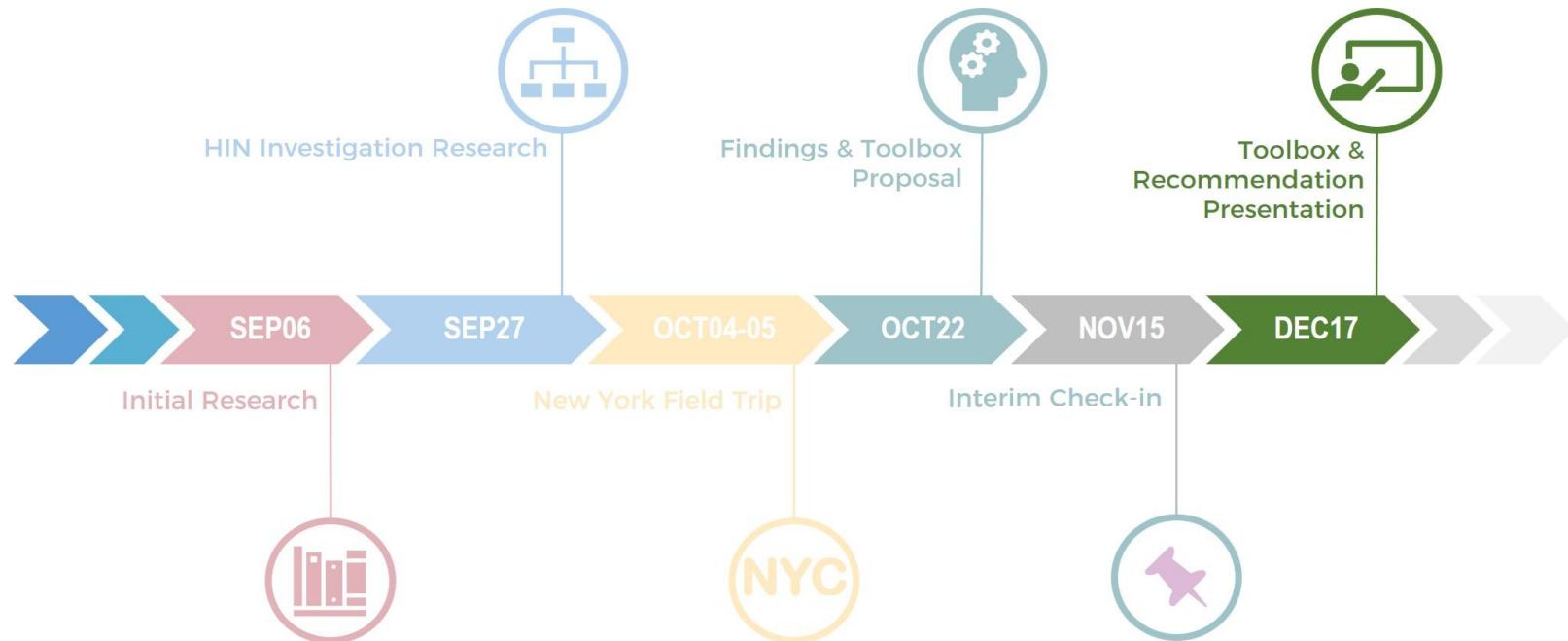
Nearly half of the High Injury Network is located in **impoverished communities of color**.

Disadvantaged neighborhoods have **40 percent more HIN roadway**.



Source: Bicycle Coalition of Greater Philadelphia, Indicators of Potential Disadvantage, Delaware Valley Regional Planning Commission

Our Studio



The
VISION
ZERO
Toolbox

*People-Driven Strategies for
Safer Philadelphia Streets*

WHO is most impacted by crashes?

WHAT

WHERE

WHEN

HOW

WHO

WHAT driver behaviors contribute most to crashes?

WHERE

WHEN

HOW

WHO

WHAT

WHERE are crashes most likely to occur?

WHEN

HOW

WHO

WHAT

WHERE

WHEN are crashes most likely to occur?

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WHERE

WHEN

HOW can the city create a new culture of safety?

WHO is most impacted by crashes?

WHAT driver behaviors contribute most to crashes?

WHERE are crashes most likely to occur?

WHEN are crashes most likely to occur?

HOW can the city create a new culture of safety?









Enhanced Intersection Lighting

Roundabout

High visibility
crosswalk

WHO

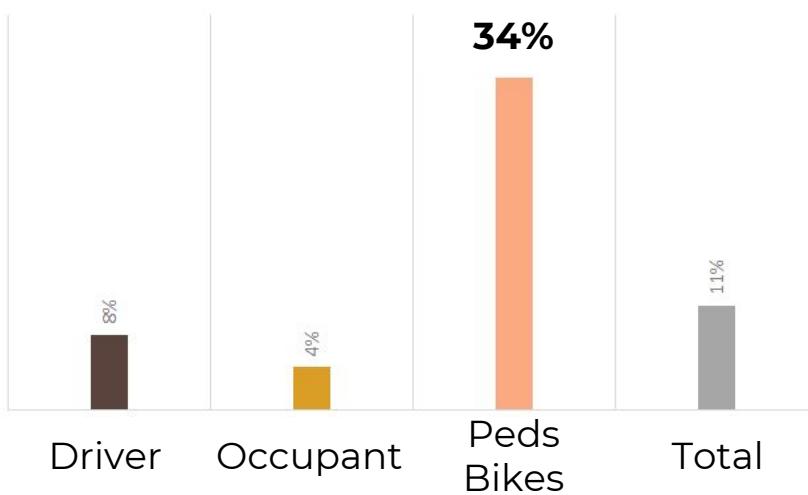


Who is most impacted by crashes?

Source: WHYY, AP Photo/Matt Slocum

WHO: Pedestrians and Cyclists

Although 81 percent of people involved in crashes were drivers and passengers, **pedestrians and cyclists have the highest fatality rate of any user group** on the High Injury Network.

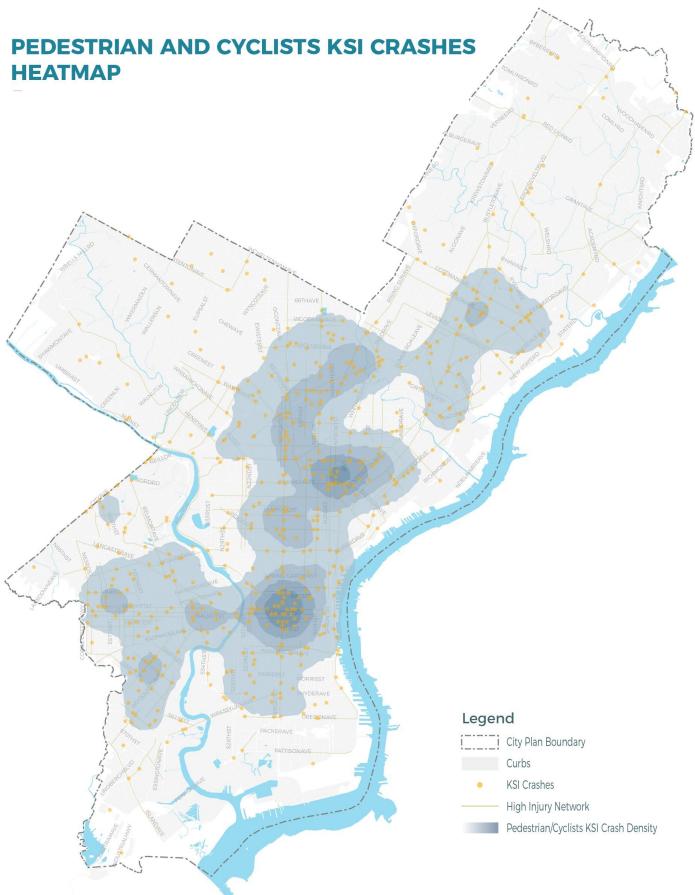


Source: PennDOT, 2013-2017

WHO: Pedestrians and Cyclists

KSI crashes involving pedestrians and cyclists occurred most frequently in **Center City, Kensington, North Philadelphia, and West Philadelphia.**

**PEDESTRIAN AND CYCLISTS KSI CRASHES
HEATMAP**

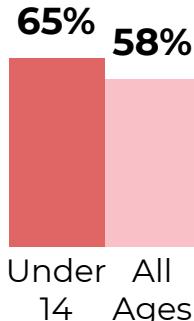


Source: PennDOT, 2013-2017

WHO: School-Aged Pedestrians

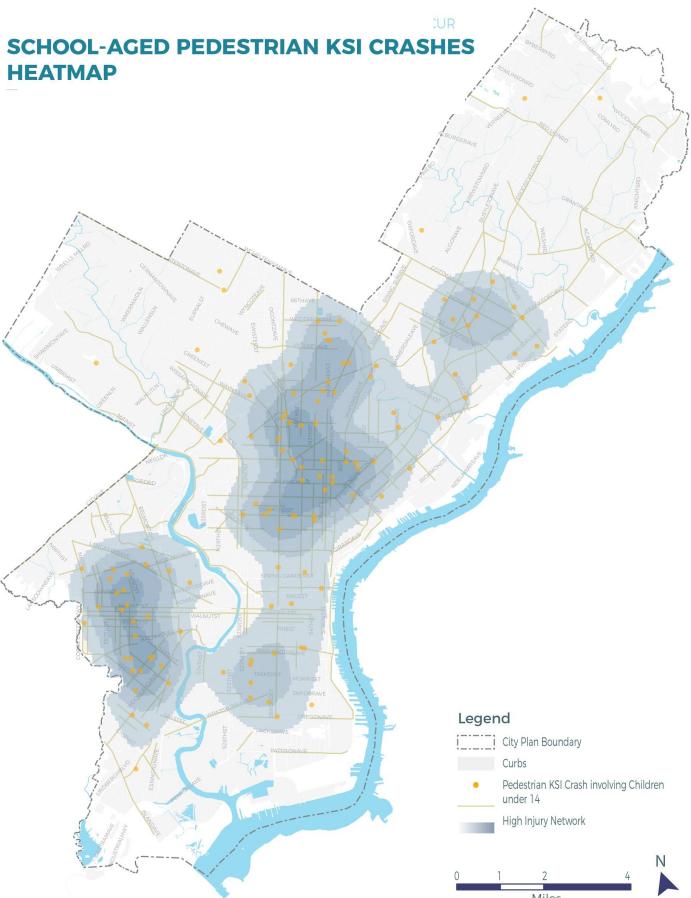
KSI crashes involving pedestrians under 14 years old, are more likely to be around schools.

80 KSI crashes occurred within a quarter mile from schools.



**Pedestrian and cyclist
KSI crashes within
0.25 mi of schools**

**SCHOOL-AGED PEDESTRIAN KSI CRASHES
HEATMAP**

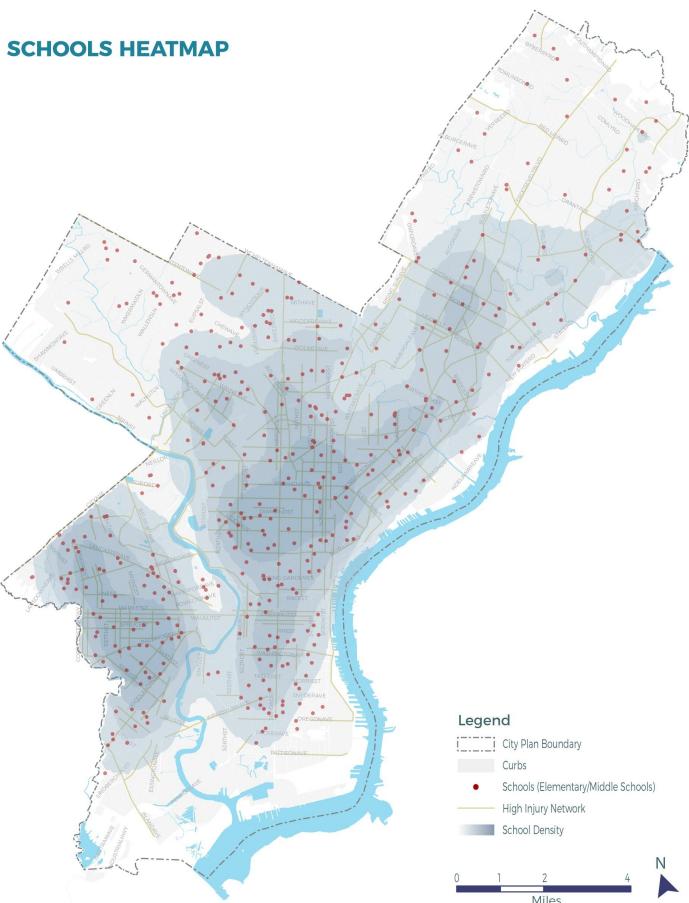


Source: PennDOT, 2013-2017

WHO: School-Aged Pedestrians

51 percent of city's elementary and middle schools are within 50 feet of the High Injury Network.

SCHOOLS HEATMAP



Source: PennDOT, 2013-2017

Strategies: School-Aged Pedestrians

Short-term:

Drop-off/pick-up zones

Mid-term:

School slow zones

Long-term:

Speed camera enforcement
around schools

PROPOSED STRATEGIES



Strategies: School-Aged Pedestrians

Short-term:

Drop-off/pick-up zones

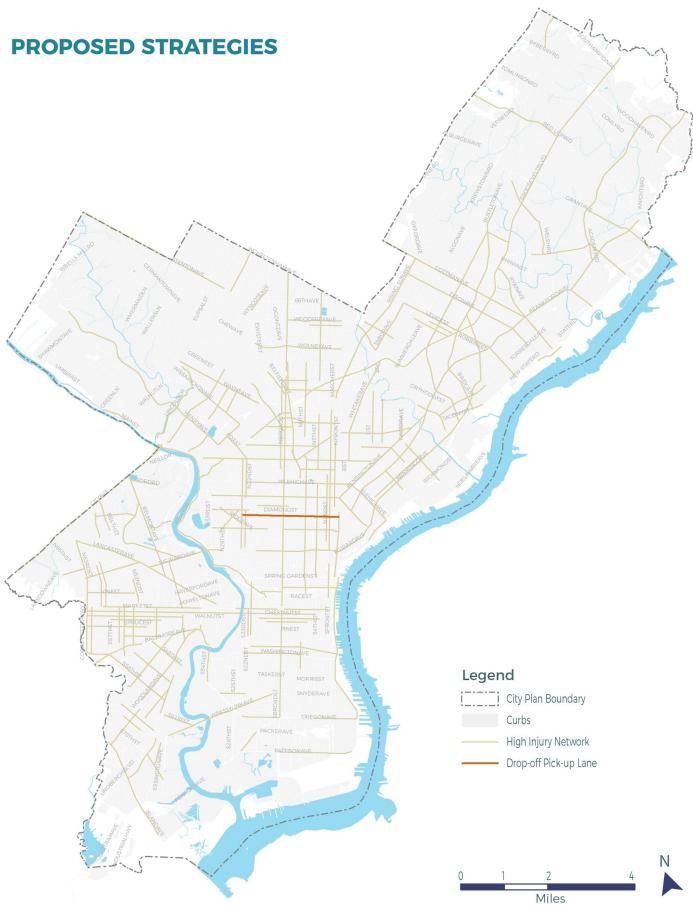
Mid-term:

School slow zones

Long-term:

Speed camera enforcement
around schools

PROPOSED STRATEGIES



Strategy: Drop-off/pick-up zones

These zones for loading and unloading children can be an effective and low-cost strategy.

Safer roads around schools are expected to encourage more children walking to schools.

Cost: **\$0.50** per feet for pavement marking and painting



David Rans



Marin Horizon School, Mill Valley, CA

Strategy: Drop-off/pick-up zones

Frederick Douglass
Mastery Elementary
N 22nd St

Before

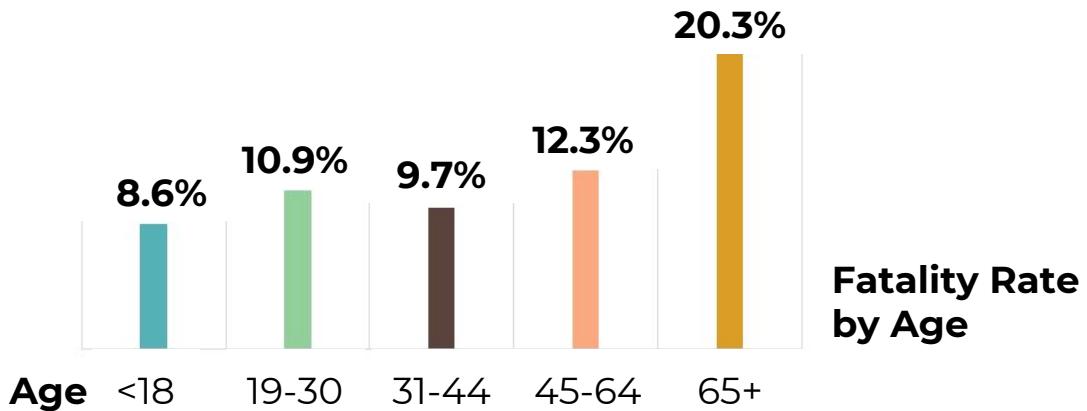


After



WHO: Older Adult Pedestrians

Pedestrians and cyclists aged 65 or older have the **highest fatality rate of any age group** on the High Injury Network.

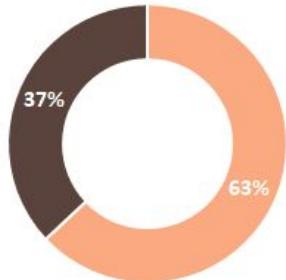


Source: PennDOT, 2013-2017

WHO: Older Adult Pedestrians

59 percent of these senior victims were pedestrians

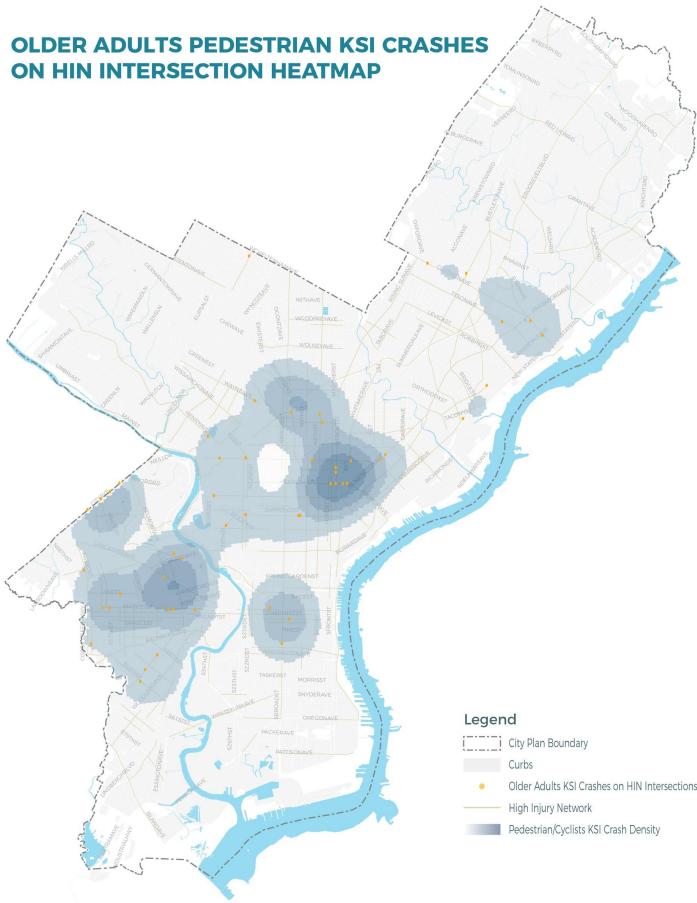
63 percent of senior pedestrians were hit at intersections.



Older Adult KSI Crashes

- Intersection
- Midblock

**OLDER ADULTS PEDESTRIAN KSI CRASHES
ON HIN INTERSECTION HEATMAP**



Source: PennDOT, 2013-2017

Strategies: Older Adult Pedestrians

Short-term:

More accessible pedestrian signals
Extended crosswalk times

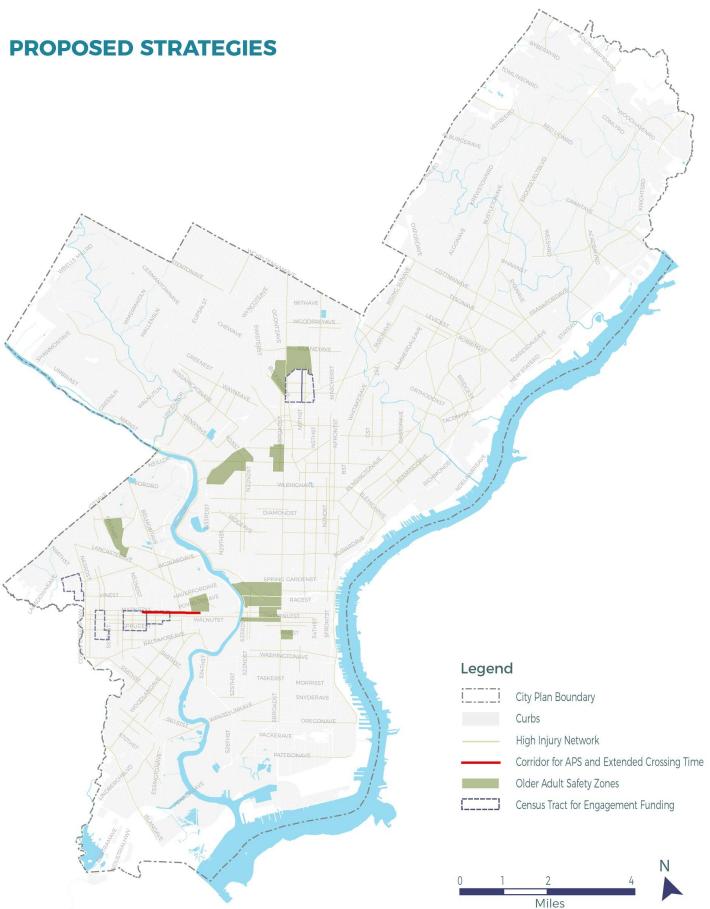
Short-term:

Older adult engagement through non-profits

Mid-term:

Senior safety zones

PROPOSED STRATEGIES



Strategies: Older Adult Pedestrians

Short-term:

- More accessible pedestrian signals
- Extended crosswalk times

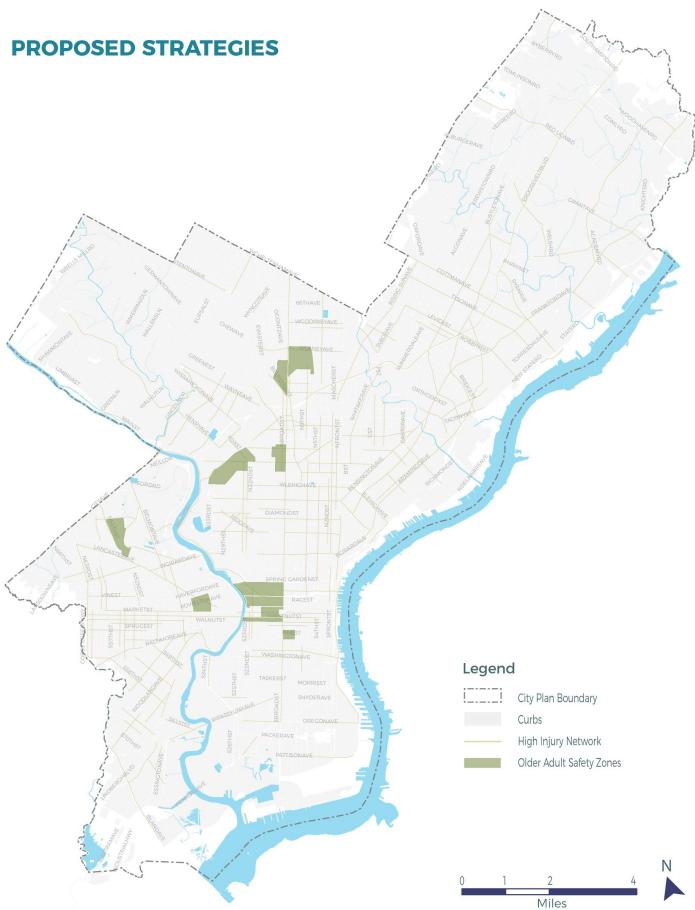
Short-term:

- Older adult engagement through non-profits

Mid-term:

- Senior safety zones

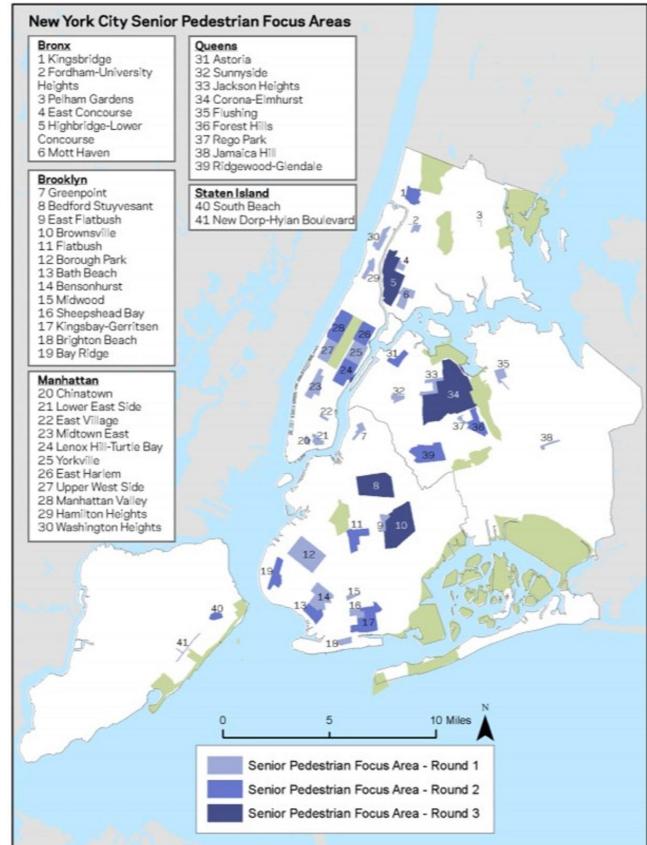
PROPOSED STRATEGIES



Strategy: Senior Safety Zone

In New York, they have created 41 of these zones based on the following factors:

- High concentrations of KSI older adult pedestrian crashes
- High concentrations of older adult populations
- High densities of nursing homes, senior centers and public housing complexes with high older adult populations
- Close proximity to major transit stops



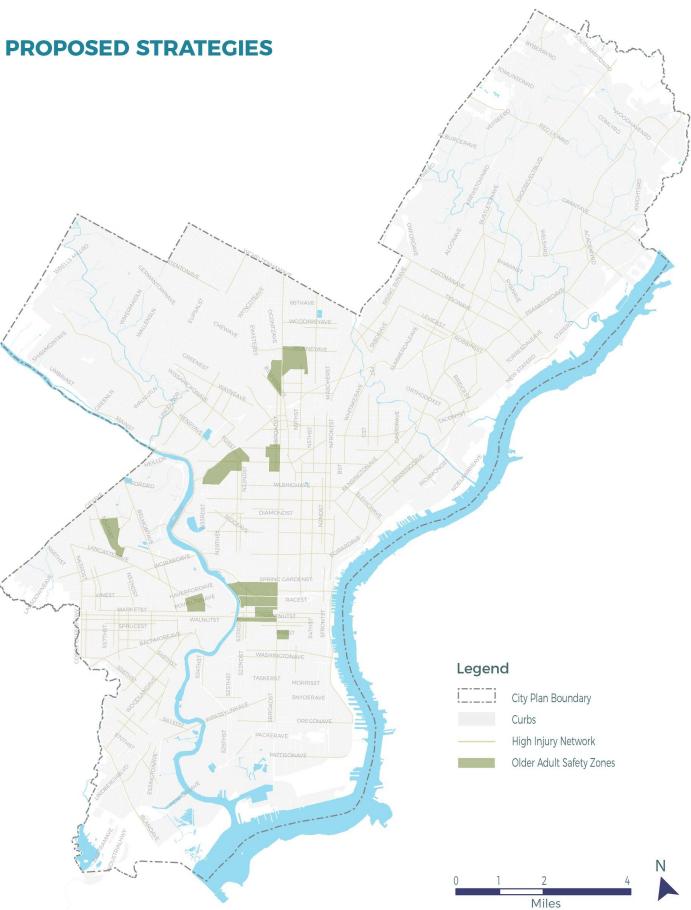
Source: New York City Department of Transportation

Strategy: Senior Safety Zone

Potential new senior safety zones in Philadelphia:

- Located in areas with the highest senior pedestrian KSI crashes at intersections
- Have higher concentrations of older adults than the city average
- Have at least one senior center
- Within 0.05 miles (one block) from a major transit stop

PROPOSED STRATEGIES



WHAT



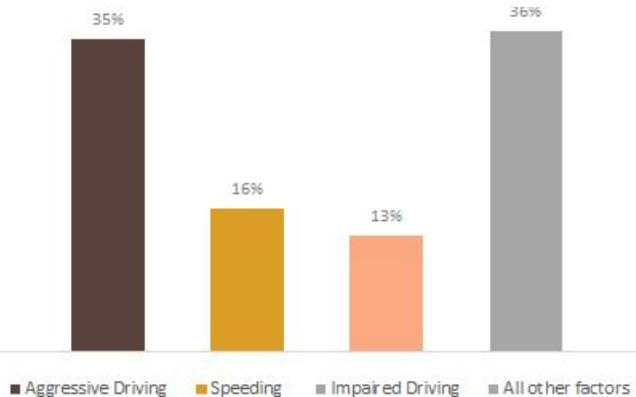
What driver behaviors contribute most to crashes?

WHAT

Aggressive driving is a factor in 35 percent of KSI crashes

Speeding and impaired driving are factors in 13-16 percent of KSI crashes

Top contributing factors of KSI crashes

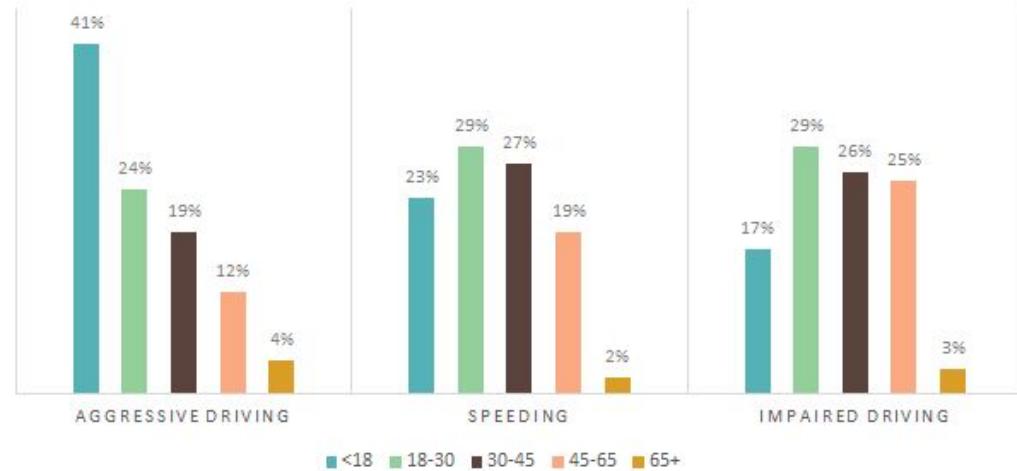


WHAT

Drivers under 18 years old is the largest group who drive aggressively

The distribution is more even for speeding and impaired driving

Contributing Factors by Age Groups



Source: PennDOT, 2013-2017

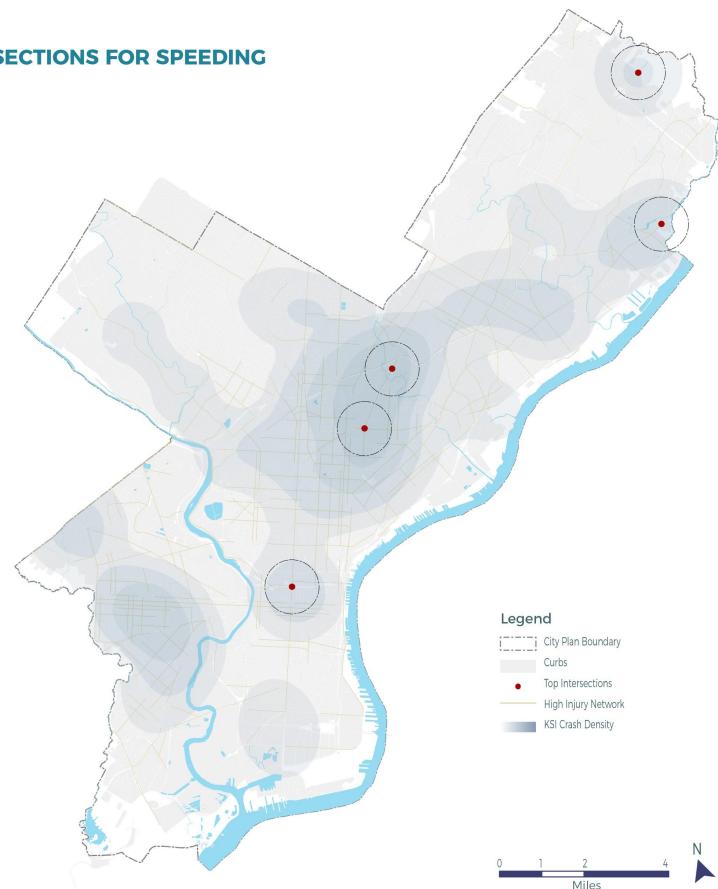
WHAT: Speeding

Speeding related KSI crashes are citywide events, as they are distributed in many different locations

Separate speeding crashes into two parts:

- At intersections
- At mid-blocks

TOP INTERSECTIONS FOR SPEEDING



Source: PennDOT, 2013-2017

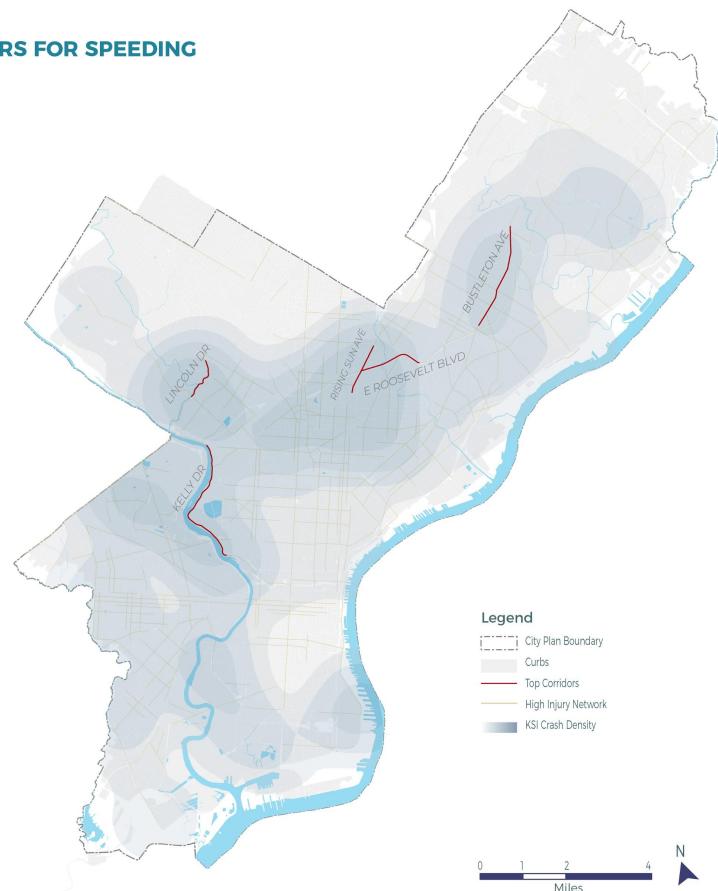
TOP CORRIDORS FOR SPEEDING

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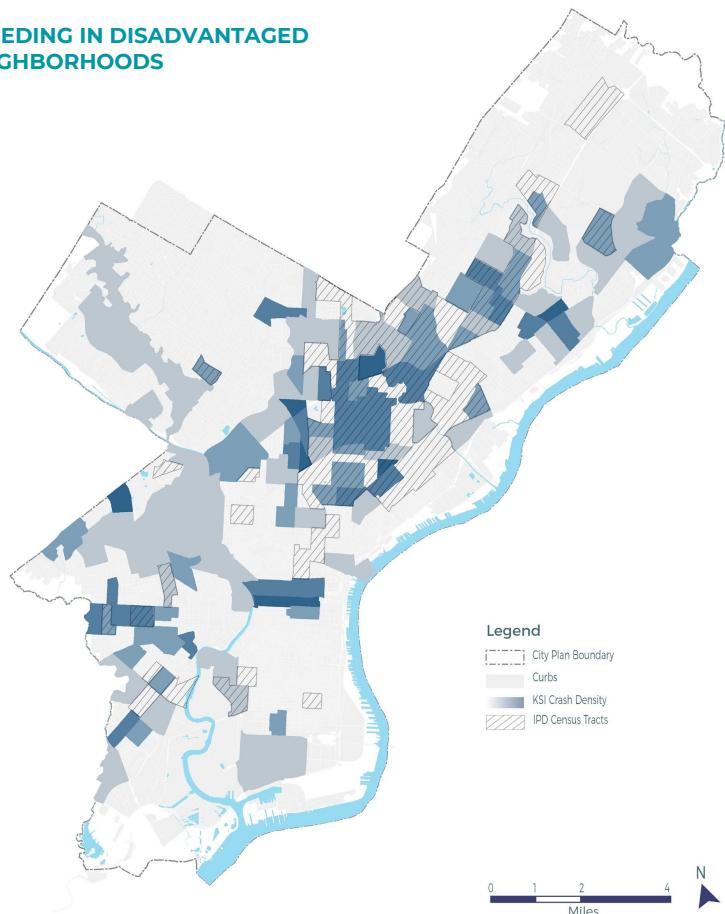
Source: PennDOT, 2013-2017

WHAT: Speeding

People living in census tracts in North Philadelphia with high density of disadvantaged groups are at higher risks of being affected

Many of these tracts have high IPD scores: where the percentage of disadvantaged population groups is among the highest in the city.

SPEEDING IN DISADVANTAGED NEIGHBORHOODS



Source: DVRPC, PennDOT, 2013-2017

Strategies: Speeding

Short-term:

Conventional speed humps

Mid-term:

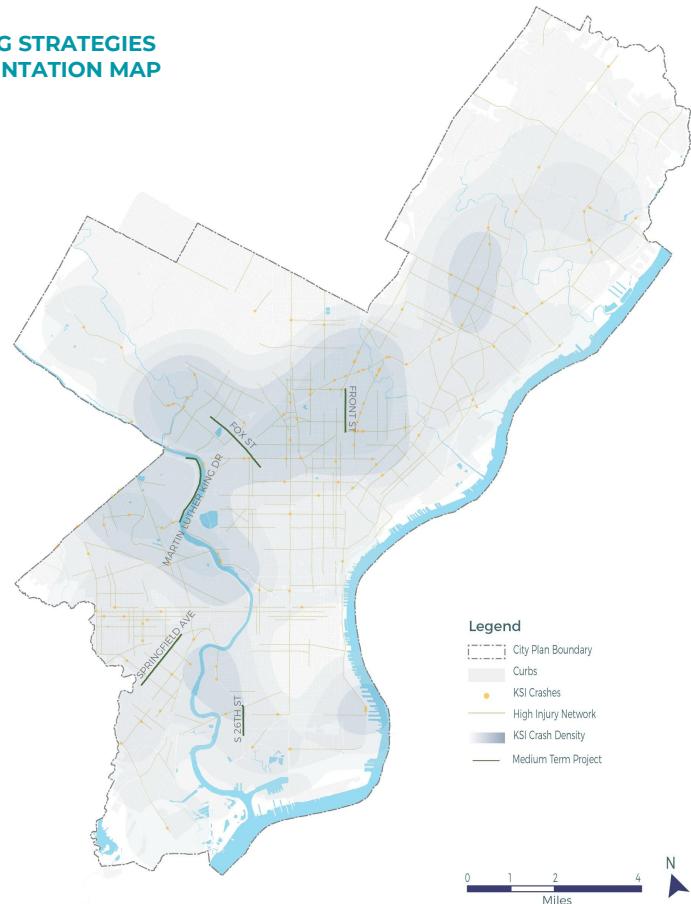
Dynamic speed humps

Raised intersections

Long-term:

Road diet

SPEEDING STRATEGIES
IMPLEMENTATION MAP



Source: PennDOT, 2013-2017

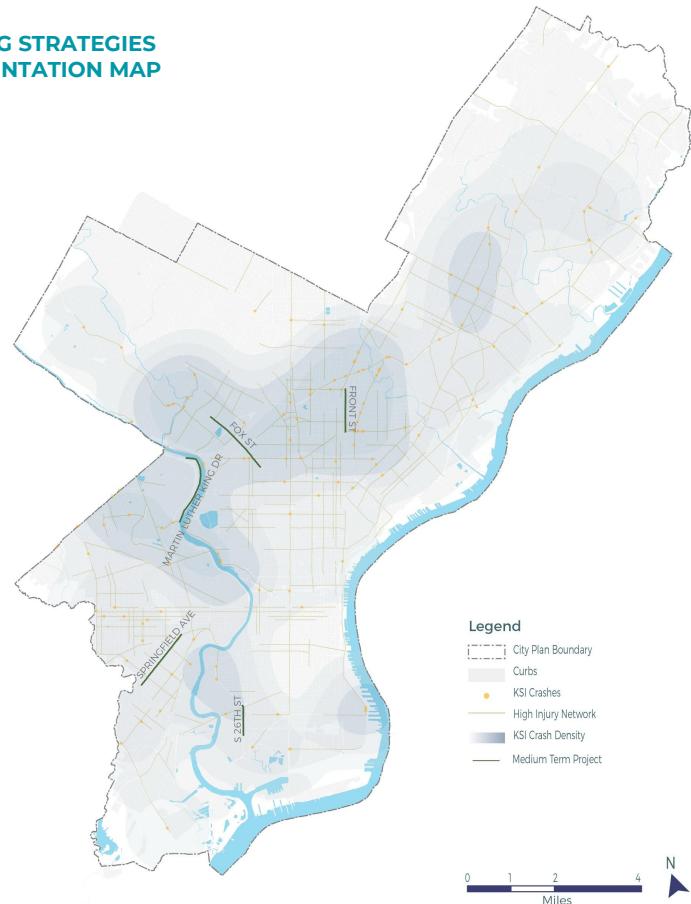
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Conventional speed humps

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Dynamic speed humps
Raised intersections

Long-term:
Road diet

SPEEDING STRATEGIES
IMPLEMENTATION MAP



Source: PennDOT, 2013-2017

Strategy: Dynamic Speed Humps

Conventional speed humps: slow response time of emergency vehicles

Only activate if a vehicle is traveling above a certain speed

- Allow the passage of emergency vehicles without delay
- Reduce noise pollution

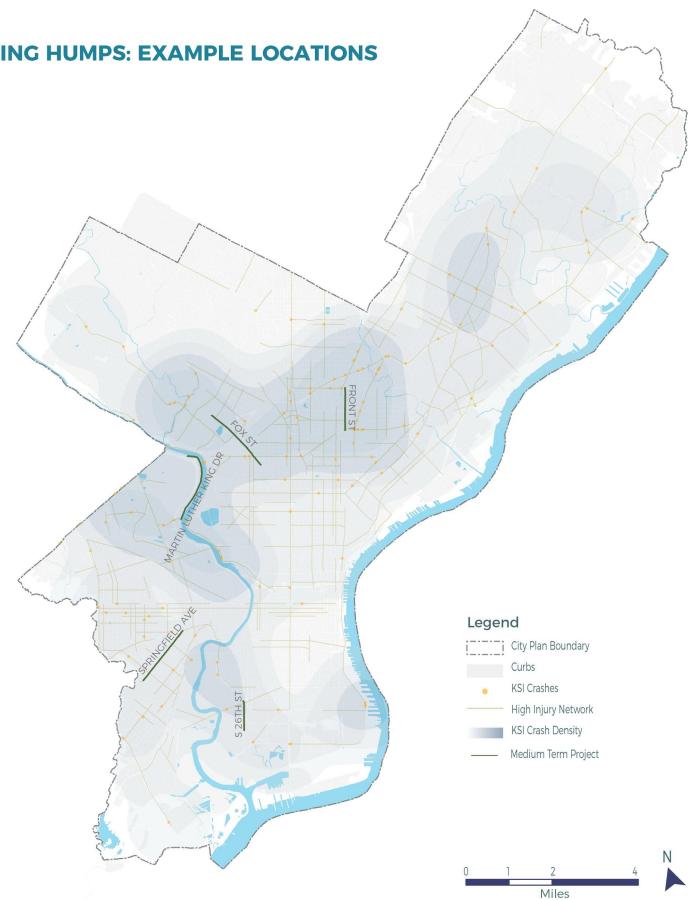


DYNAMIC SPEEDING HUMPS: EXAMPLE LOCATIONS

Strategy: Dynamic Speed Humps

Selection Criteria:

- Streets citywide with the highest speeding densities
- Streets with traffic volume lower than 6,000 vehicles/day



Source: PennDOT, 2013-2017

Strategy: Dynamic Speed Humps

Expected to reduce speeding related crashes by 45-50 percent

Responsible agencies: PennDOT, oTIS, Philadelphia Streets Department

Cost: The cost over a period of ten year is approximately \$14,200 per site



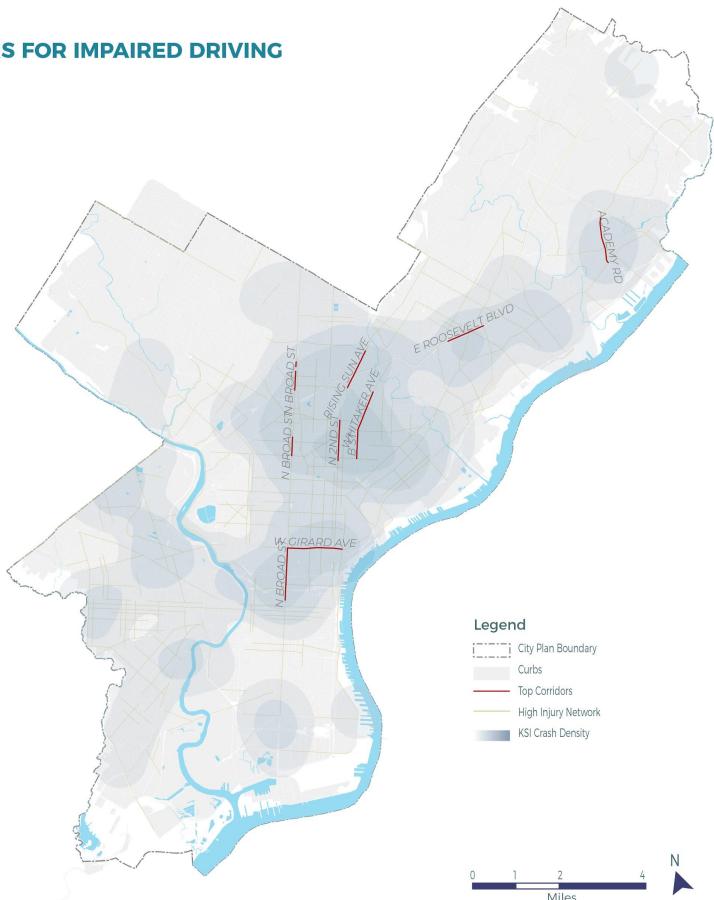
Source: Karin Andersson

WHAT: Impaired Driving

Hotspots are more concentrated, and mainly located in Spring Garden and North Philadelphia.

Most of the top 10 corridors are among the busiest city streets.

TOP CORRIDORS FOR IMPAIRED DRIVING

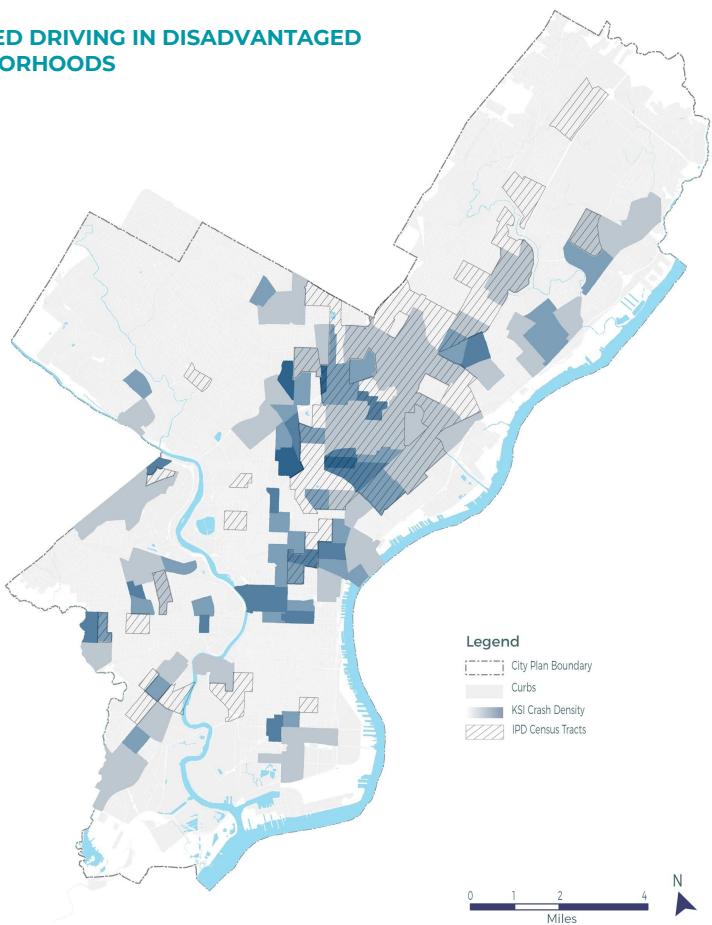


Source: PennDOT, 2013-2017

WHAT: Impaired Driving

Like with speeding, residents in North Philadelphia census tracts with high IPD scores are at higher risks of being affected.

IMPAIRED DRIVING IN DISADVANTAGED NEIGHBORHOODS



Source: DVRPC, PennDOT, 2013-2017

Strategies: Impaired Driving

Short-term:

Alcohol screening

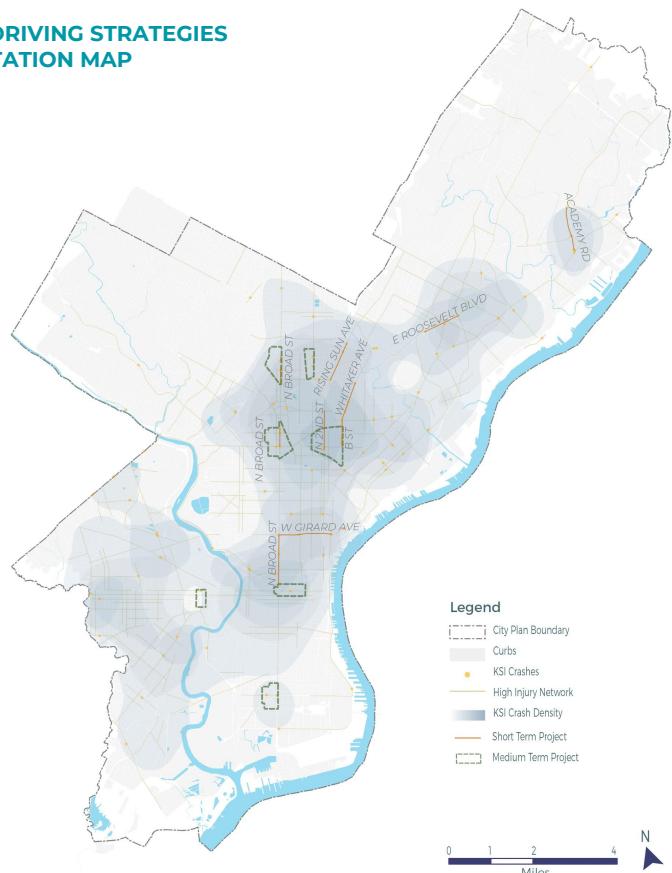
Mid-term:

Ignition interlock

Long-term:

Lowering the state limit for criminal alcohol-impaired driving from 0.08 percent to 0.05 percent BAC

IMPAIRED DRIVING STRATEGIES
IMPLEMENTATION MAP



Source: PennDOT, 2013-2017

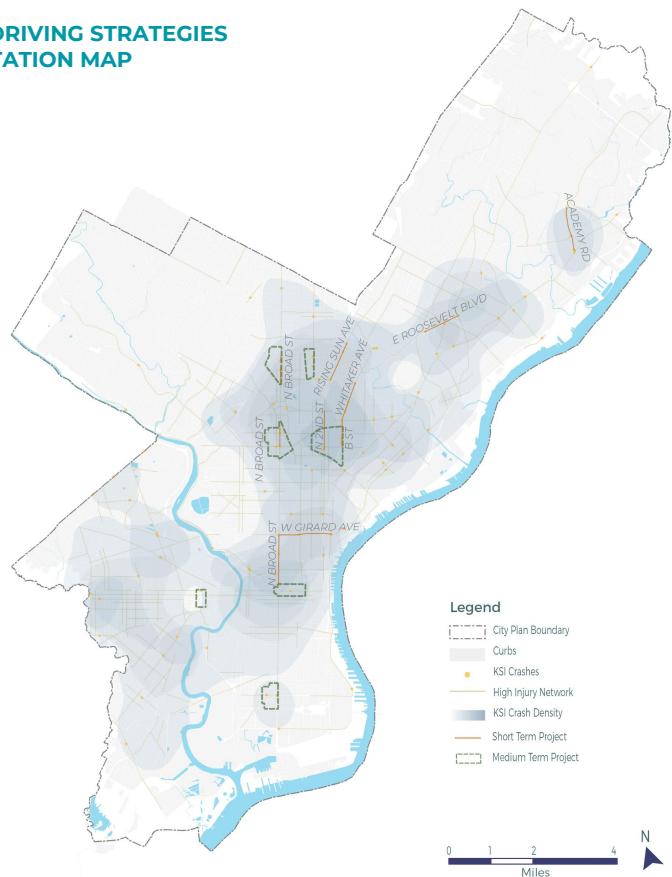
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to 0.05 percent BAC

IMPAIRED DRIVING STRATEGIES
IMPLEMENTATION MAP



Source: PennDOT, 2013-2017

Strategy: Ignition Interlock

The ignition interlock measures the alcohol in a person's system. If that amount exceeds a pre-programmed level, then the interlock temporarily locks the vehicle's ignition.

To prevent drivers from drinking alcohol after the initial test, a random rolling retest while driving will be required.



Strategy: Ignition Interlock

The city has a legal basis already.

Our recommendation:

- Lower the blood alcohol threshold from 0.1 percent to 0.08 percent
- Extend the first waiting period to 1 hour
- Extend the duration from 1 to 3 years
- Data received from ignition interlock devices should also be sent to related authorities to decide further punishment on drivers who repeatedly failed to pass the tests



Strategy: Ignition Interlock

Responsible agencies: PennDOT, Philadelphia Police Department, Division of Driver License, and DUI treatment programs

Cost: Ignition interlocks generally cost between \$60 and \$90 a month to lease with an initial installation cost of \$100 per system. Individuals will bear the cost themselves.



Source: License Restoration Services

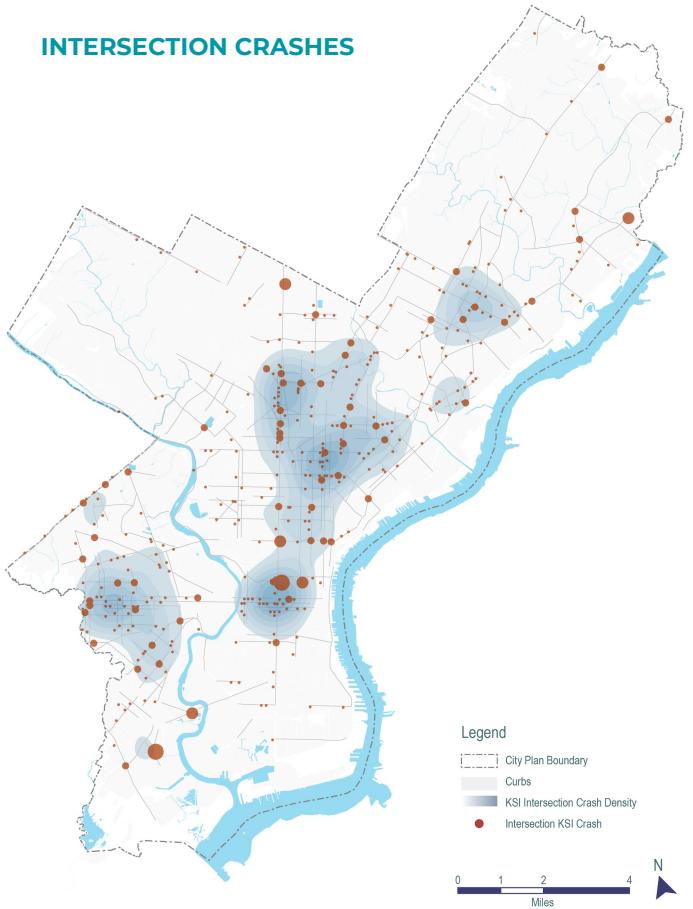
WHERE



Where are crashes most likely to occur?

Photo Source: Vision Zero Philadelphia, City of Philadelphia Office of Transportation, Infrastructure, and Sustainability

INTERSECTION CRASHES

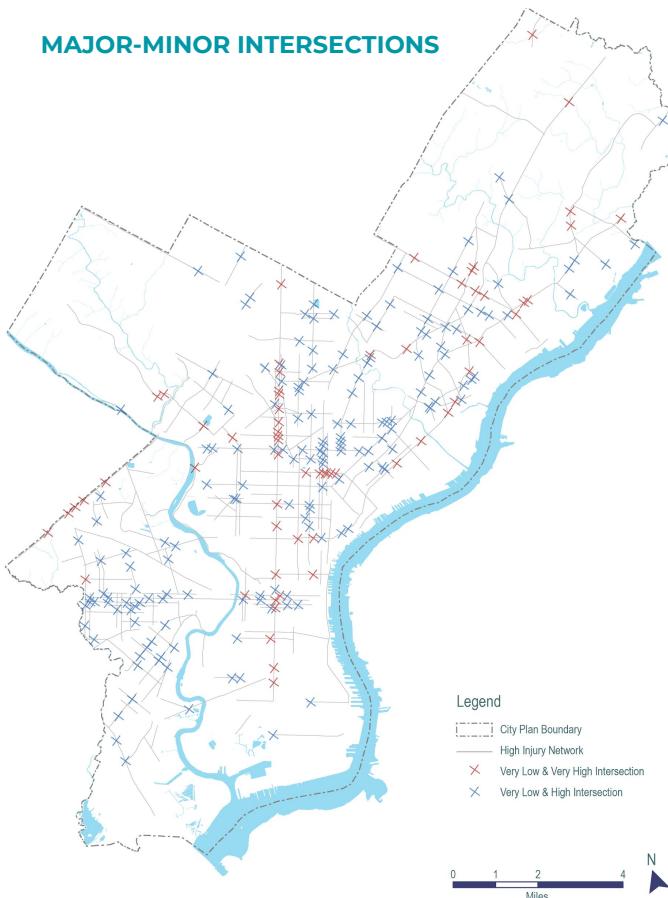


WHERE

59 percent of KSI crashes on the HIN occur at intersections.

Source: PennDOT, 2013-2017

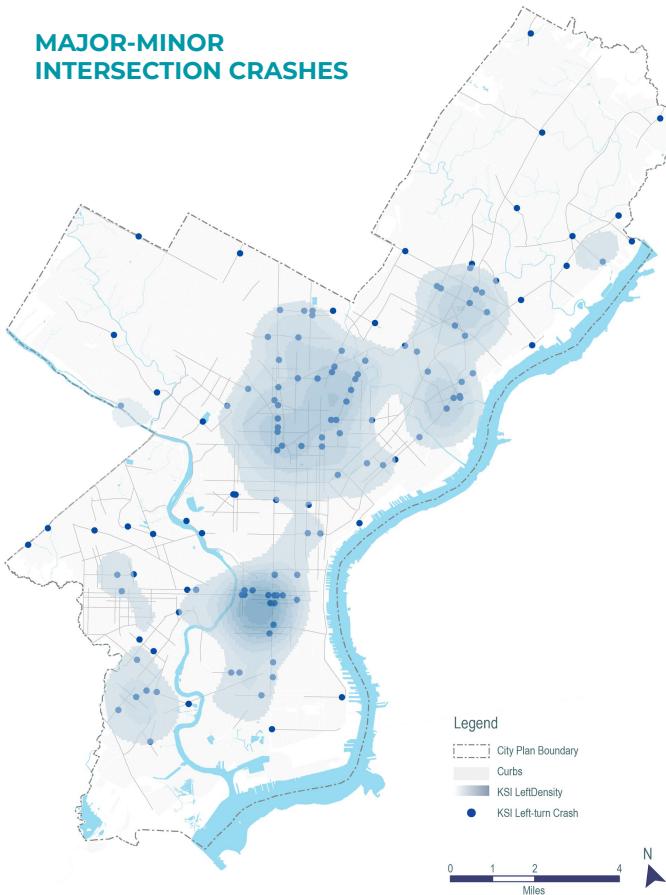
MAJOR-MINOR INTERSECTIONS



WHERE: Major-Minor Intersections

Major-minor intersections make up 59 percent of intersections in the High Injury Network, compared to 27 percent of intersections in Philadelphia's street network as a whole.

MAJOR-MINOR INTERSECTION CRASHES



WHERE: Major-Minor Intersections

33 percent of major-minor intersections across the High Injury Network experienced at least one left-turn crash, compared to **25 percent** of the other intersection typologies.

Source: PennDOT, 2013-2017

Strategies: Major-Minor Intersections

Short-term:

Left-turn bays

Medium-term:

Protected left-turn signal phasing

Long-term:

Left-turn prohibition

Strategies: Major-Minor Intersections

Short-term:

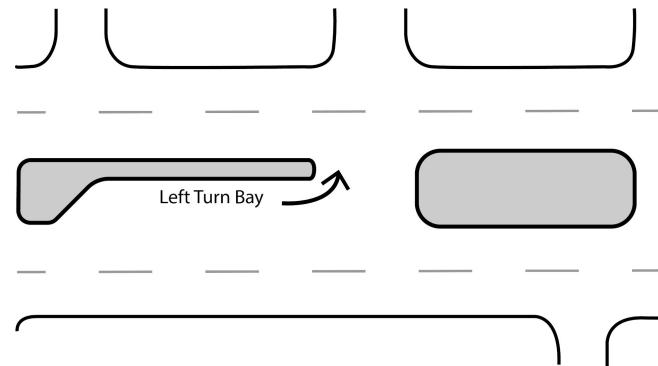
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Medium-term:

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Long-term:

Left-turn prohibition

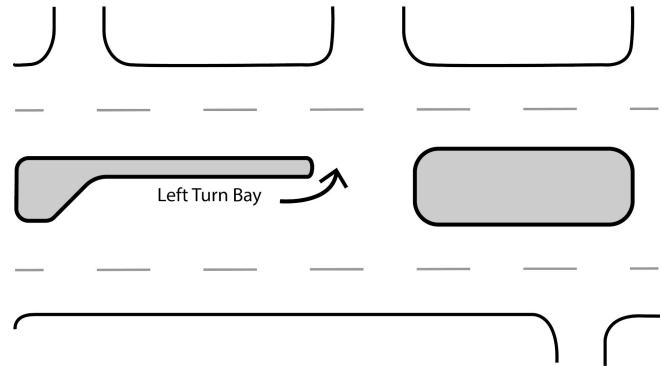


Strategy: Left Turn Bays

Reduce “back pressure”

Reduce injury crashes by 21 percent

Cost \$535-\$1,065 per foot



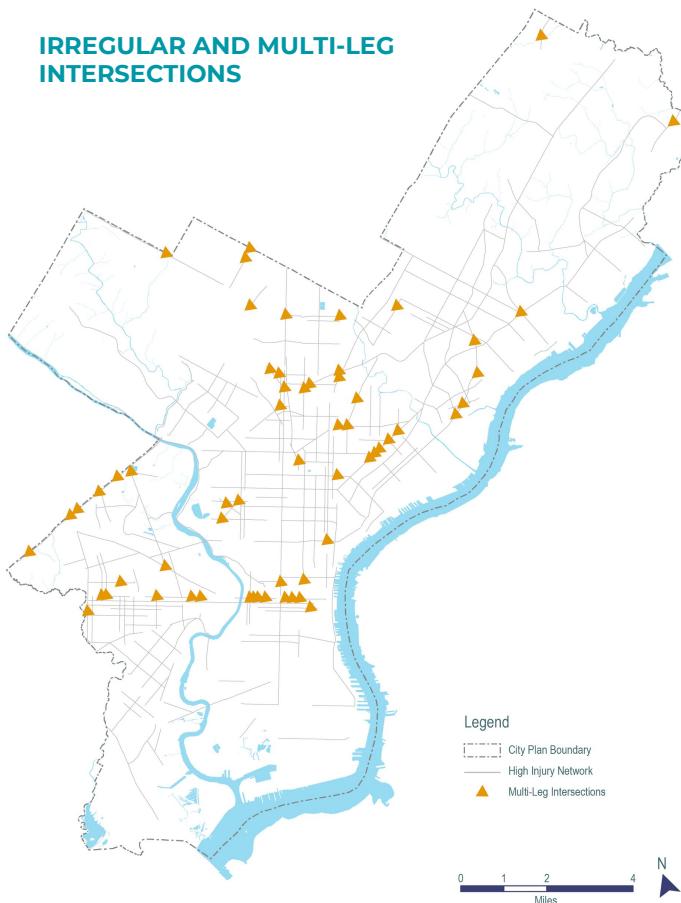


WHERE:Irregular Intersections

There are two types of irregular intersections:

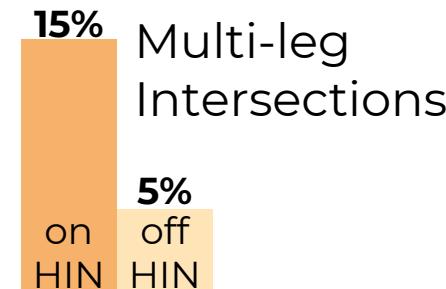
- **multi-leg** intersections
- **skewed** intersections

IRREGULAR AND MULTI-LEG INTERSECTIONS



WHERE: Irregular Intersections

15 percent of intersections across the High Injury Network are multi-leg intersections, compared to 5 percent of intersections across the street network as a whole.



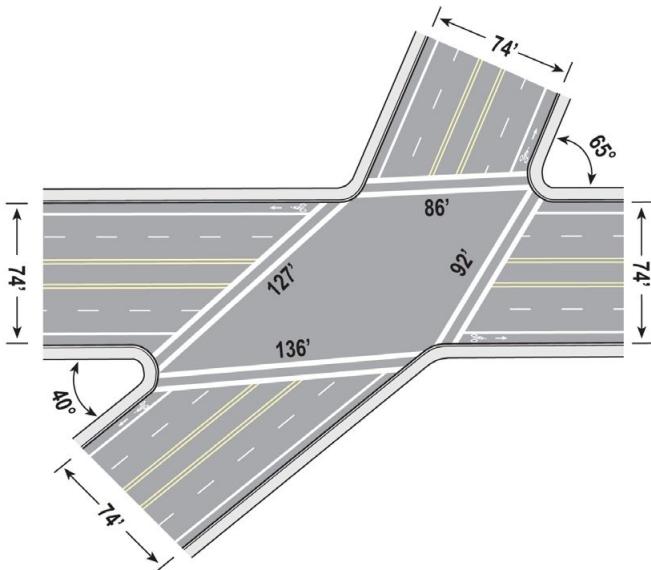
WHERE:Irregular Intersections

Skewed intersections

Line-of-sight issues

Large curb radii

Longer crossing distances for both vehicles and pedestrians



Strategies: Skewed Intersections

Short-term:

More frequent restriping

Medium-term:

Roundabouts

Long-term:

Realignment

Strategies: Skewed Intersections

Short-term:
More frequent restriping

Medium-term:
Roundabouts

Long-term:
Realignment

Intersection of East Vernon Road,
Ardleigh Street, and East Phil Ellena Street



Source: Urban Engineers

Strategy: Roundabouts

FHWA proven safety countermeasure

Reduced number of conflict points

Reduce injury crashes by approximately **80 percent**

Cost: \$250,000



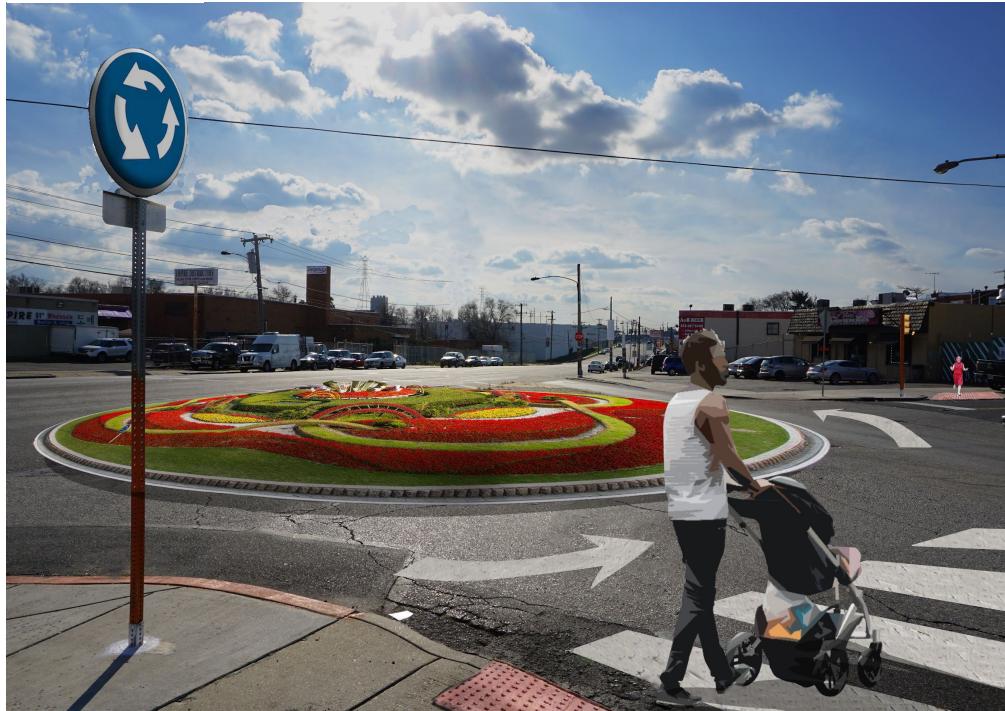
Strategy: Roundabouts

Whitaker Ave
East Wingohocking Street
D Street

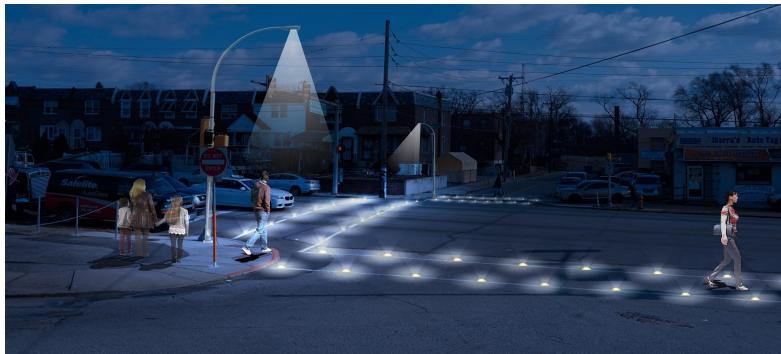
Before



After



WHEN



When are crashes most likely
to occur?

Month	Weekday	Overnight						AM Peak				Midday						PM Peak				Evening											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
Jan	MON	0.69	1.61	1.61	1.38	0.69	0.46	1.61	1.38	1.61	1.61	1.61	1.61	0.46	0.69	0.92	1.38	1.38	1.15	0.69	0.92	0.92	1.15	0.69	0.69								
	TUE	0.46	0.92	0.92	0.92	0.69	0.46	1.84	1.61	2.53	2.07	2.07	1.61	0.69	1.15	0.92	1.61	1.61	1.38	1.15	0.92	0.92	1.15	0.69	0.69								
	WED	0.69	1.84	1.84	1.84	1.15	0.69	1.53	1.84	2.99	2.30	2.30	1.84	0.92	1.61	0.92	0.92	0.69	0.69	1.38	1.61	0.92	0.92	0.69	0.92								
	THU	0.92	2.07	1.61	1.38	0.46	0.23	1.38	1.15	2.30	1.84	1.84	1.15	0.69	0.92	0.69	0.69	0.92	0.69	1.38	1.61	1.84	1.15	0.46	0.92								
	FRI	0.69	1.84	1.61	1.38	0.46	0.23	0.92	0.92	1.61	1.84	1.84	1.38	0.69	0.46	0.69	0.92	1.61	1.38	1.15	1.38	0.92	0.92	1.15	0.69	0.69							
Feb	MON	0.46	1.15	1.15	2.30	1.38	0.46	0.46	1.15	2.53	2.30	1.84	1.15	1.15	1.38	0.92	1.84	1.84	2.30	2.07	1.61	1.38	1.15	1.15	1.15	1.15							
	TUE	0.69	1.38	1.15	2.30	1.38	1.38	0.23	0.23	0.46	1.84	2.07	2.07	1.38	0.92	0.69	0.46	1.38	2.07	2.53	2.07	1.61	1.61	1.61	1.61	1.61	1.61						
	WED	0.69	1.38	1.15	2.30	1.61	1.61	0.46	0.00	0.00	0.92	1.38	1.61	1.15	0.92	0.69	1.61	2.53	2.76	2.07	1.38	1.15	1.38	1.38	1.38	1.38							
	THU	0.23	0.23	0.00	0.00	0.23	0.23	0.46	0.23	0.69	0.69	1.15	1.15	2.07	1.61	1.61	1.38	1.84	1.84	2.07	1.84	1.61	0.92	0.92	0.92	0.92	0.92						
	FRI	0.00	0.00	0.00	0.00	0.23	0.23	0.46	0.46	1.15	1.61	1.38	0.92	2.07	2.07	2.30	1.38	1.61	1.88	1.38	1.61	1.38	0.92	0.46	0.46	0.46	0.46	0.46					
Mar	MON	0.92	1.15	1.84	2.99	2.53	2.30	2.90	0.92	1.15	1.15	0.92	0.46	0.00	0.00	0.23	0.46	1.15	1.15	1.38	0.92	0.69	0.46	0.92	1.15	0.92	0.92	0.92					
	TUE	1.61	1.84	2.30	2.99	2.53	2.30	1.15	0.92	1.38	1.15	1.15	0.46	0.69	1.61	2.07	2.53	1.61	1.61	0.92	0.46	0.92	0.92	1.15	1.15	1.15	1.15	1.15	1.15				
	WED	1.61	1.84	2.53	3.22	2.76	2.07	1.15	0.92	1.84	1.84	2.30	1.38	1.61	1.84	2.07	2.07	2.07	1.61	2.99	2.30	2.07	0.46	0.69	1.15	1.38	1.38	1.38					
	THU	0.92	1.15	1.15	1.15	0.69	0.92	1.15	1.61	2.30	2.30	2.30	1.38	1.61	1.84	2.07	2.07	2.07	1.61	2.99	2.30	2.07	0.46	0.69	1.15	1.38	1.38	1.38					
	FRI	0.46	0.23	0.46	0.69	0.46	0.69	1.15	1.61	1.38	1.38	1.38	0.92	0.69	0.69	0.92	0.92	1.15	1.61	2.30	1.84	1.38	0.46	0.92	0.92	0.92	0.92	0.92					
Apr	MON	2.99	2.30	2.76	2.53	2.07	0.46	0.46	0.92	1.38	1.61	1.38	1.15	1.38	2.07	2.99	3.22	2.53	2.53	3.22	3.91	3.91	3.22	2.99	3.45	3.45	3.45	3.45	3.45				
	TUE	2.53	1.61	2.76	2.53	2.07	0.46	0.46	0.92	1.15	1.38	2.07	3.22	3.45	2.99	2.53	2.53	3.45	3.68	3.45	3.45	2.76	2.99	2.76	2.76	2.76	2.76	2.76	2.76				
	WED	2.30	1.61	2.76	2.30	2.07	0.92	0.92	0.46	0.46	1.38	1.84	2.99	2.53	2.07	2.30	2.76	3.45	3.68	3.91	3.22	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99				
	THU	1.61	1.15	0.23	0.23	0.92	0.92	0.69	0.69	0.46	0.46	0.92	1.38	2.07	1.38	1.84	1.84	2.53	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30					
	FRI	2.30	1.61	0.46	0.69	1.15	0.69	0.92	0.92	1.61	1.38	1.38	1.38	0.69	1.38	1.61	1.38	1.38	2.30	2.76	3.22	3.68	3.22	2.53	2.53	2.53	2.53	2.53	2.53				
May	MON	2.53	2.53	2.07	1.84	1.38	0.92	1.38	1.15	1.15	0.69	0.46	0.46	1.38	2.53	2.76	4.37	4.37	4.37	4.37	4.37	3.91	2.53	2.53	2.99	2.76	3.91	3.91	3.91	3.91	3.91	3.91	
	TUE	2.76	2.99	2.76	2.30	1.38	0.69	0.92	0.92	0.69	0.69	0.46	1.15	2.76	2.99	4.83	3.45	4.14	2.07	3.22	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53			
	WED	2.53	3.22	3.45	2.76	1.38	0.69	1.15	1.15	1.15	1.61	1.38	1.38	0.69	1.61	2.30	4.60	4.14	3.68	2.07	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30				
	THU	2.07	2.30	1.84	1.38	0.46	0.69	1.15	0.92	0.92	0.69	0.69	0.46	1.38	1.61	2.07	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53		
	FRI	2.30	1.61	0.46	0.69	1.15	0.69	0.92	0.92	1.61	1.38	1.38	1.38	0.69	1.38	1.61	1.38	1.38	2.30	2.76	3.22	3.68	3.22	2.53	2.53	2.53	2.53	2.53	2.53				
Jun	MON	1.38	1.61	1.38	0.92	1.38	1.15	1.15	1.15	1.61	1.38	1.38	1.38	0.69	1.38	1.61	1.38	1.38	2.30	2.76	3.22	3.68	3.22	2.53	2.53	2.53	2.53	2.53	2.53				
	TUE	1.61	1.61	1.38	1.15	1.61	1.15	1.15	1.15	0.92	1.23	0.92	0.92	0.46	1.38	2.30	2.76	3.22	3.68	3.45	3.22	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53		
	WED	2.53	2.53	2.07	1.61	1.61	1.15	1.15	1.15	1.61	1.38	1.38	1.38	0.69	1.38	2.30	2.76	3.22	3.68	3.45	3.22	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53		
	THU	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61				
	FRI	1.15	1.38	1.15	0.92	1.15	0.92	0.46	0.46	1.15	1.38	1.38	1.38	0.69	1.38	2.07	2.76	3.22	3.68	3.45	3.22	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53		
Jul	MON	2.76	2.99	2.76	1.61	0.69	0.92	0.92	0.69	0.69	0.46	0.46	1.15	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61				
	TUE	2.07	1.61	2.30	2.76	1.61	0.92	0.46	0.46	1.38	1.61	1.61	1.61	1.38	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61		
	WED	3.22	3.45	2.76	2.30	1.38	0.92	0.92	0.69	0.69	0.46	0.46	1.15	1.61	2.07	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30		
	THU	3.45	2.99	4.14	2.76	1.61	0.92	0.46	0.46	1.38	1.61	1.61	1.61	1.38	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61		
	FRI	2.99	3.22	2.53	1.84	1.84	2.07	0.92	1.61	1.61	1.38	1.38	1.38	1.38	0.69	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	
Aug	MON	2.53	2.30	2.30	1.84	1.84	2.07	1.15	0.92	0.46	0.46	0.92	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38		
	TUE	2.30	2.53	2.53	2.76	2.30	2.30	1.15	1.61	1.61	1.61	1.61	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	
	WED	2.99	2.99	2.53	2.53	2.99	2.53	0.92	0.23	0.00	0.46	1.15	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	
	THU	3.22	2.76	2.53	1.84	1.61	1.38	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	
	FRI	2.76	2.53	1.84	0.92	0.46	0.69	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Sep	MON	2.07	2.30	2.07	2.07	1.15	1.81	0.92	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61
	TUE	2.76	3.22																														

Average Number of Deaths and Serious Injuries

Weekdays by month and hour

3Hour-3Day
Mothly KSI Victims
Rolling Average

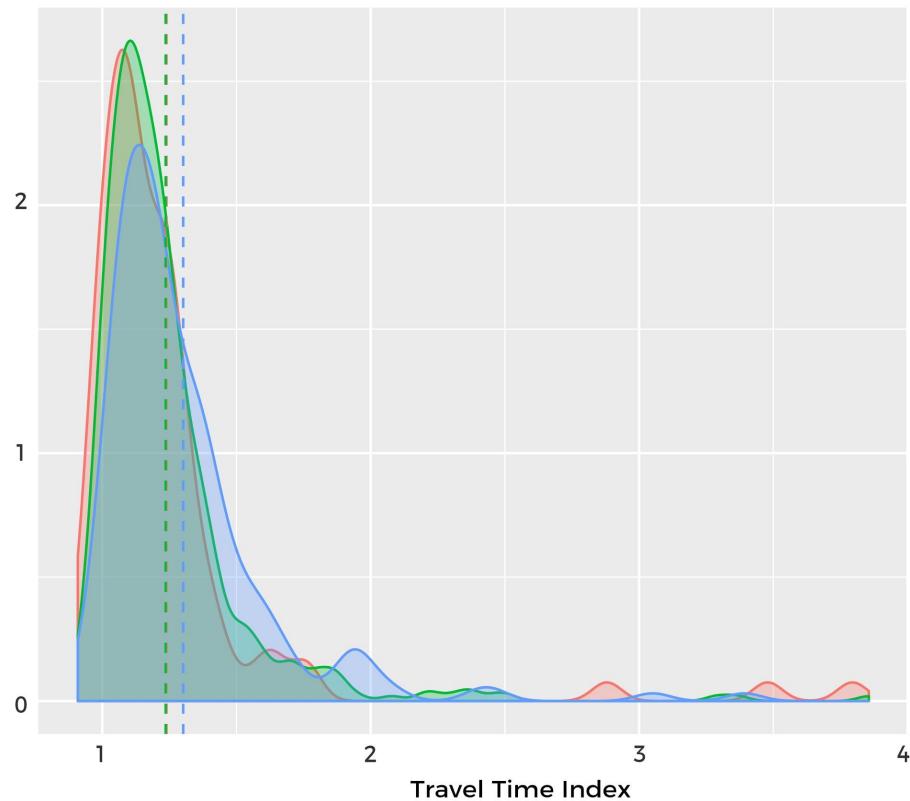
Low KSI High KSI

© 2010 Scholastic Inc.

Daylight Savings

Source: PennDOT, 2013-2017

Road Congestion Level during KSI crashes



WHEN: Peak Hour Crashes

Period	Average road TTI during KSI crashes
Am Peak	1.239
Midday	1.236
Pm Peak	1.302

Source: PennDOT, 2013-2017



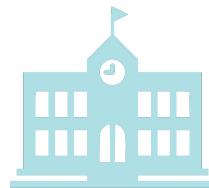
Road conditions

Dark Road
Icy Road
Snow/Slush
Wet Road
...



Vulnerable users

Pedestrian
Motorcyclists
...



WHEN: Other Factors



Schools or young drivers

School Zone
18-Year-Old Driver
19-Year-Old Driver
...

Behavioral factors

Drinking Driver
Alcohol Use
Speeding
Fatigued Driver
...

Strategies: Peak Hour Crashes

Short-term:

School bus enforcement
Travel Demand Management

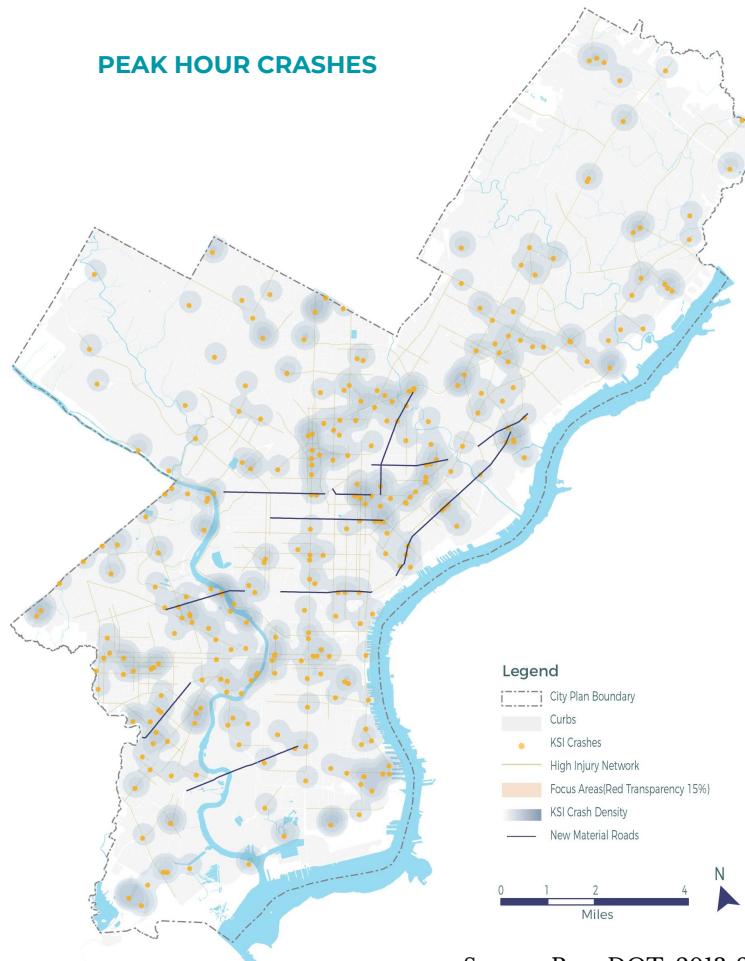
Medium-term:

Road function transition
After-school safety enforcement

Long-term:

New road materials

PEAK HOUR CRASHES



Source: PennDOT, 2013-2017

Strategies: Peak Hour Crashes

Short-term:

School bus enforcement
Travel Demand Management

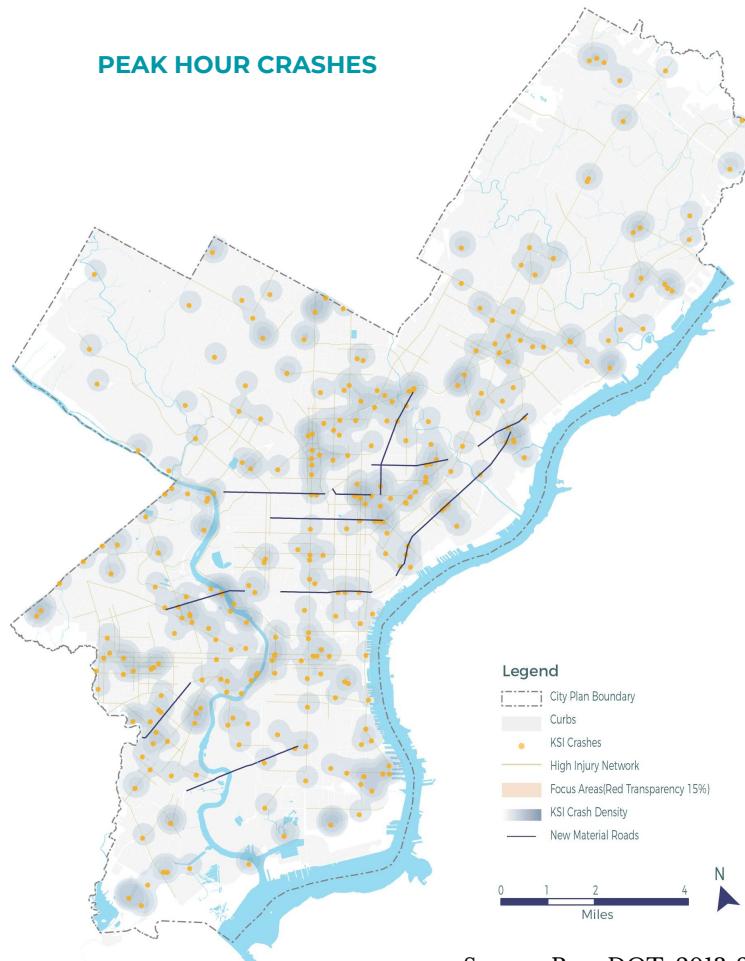
Medium-term:

Road function transition
After-school safety enforcement

Long-term:

New road materials

PEAK HOUR CRASHES



Source: PennDOT, 2013-2017

Strategy:School Bus Enforcement

Increase the penalty for violating the School Bus Stopping Law, which typically happens during the AM peak.

PENALTIES

If you are convicted of violating Pennsylvania's School Bus Stopping Law, you will receive all of the following penalties:

- ◆ 60-Day Driver's License Suspension
- ◆ Five (5) points on your driving record
- ◆ \$250 Fine

Annually, more than 700 drivers are convicted for passing a stopped school bus with its red lights flashing.

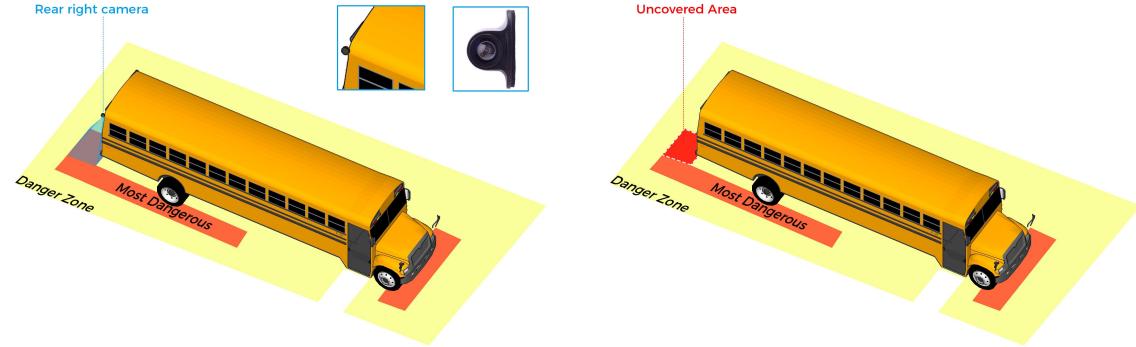
PENALTIES

If you are convicted of violating Pennsylvania's School Bus Stopping Law, you will receive all of the following penalties:

- ◆ 60-Day Driver's License Suspension
- ◆ **90-Day Driver's License Suspension**
- ◆ Five (5) points on your driving record
 - ◆ **8 points on your driving record**
- ◆ \$250 Fine
 - ◆ **\$375 Fine**
- ◆ **A second violation will be accompanied by a required volunteer work for the School District of Philadelphia**

Strategy: School Bus Enforcement

Rear view cameras
(left and right) to view
dangerous blind spots



Illuminated “do not pass”
signage to alert drivers

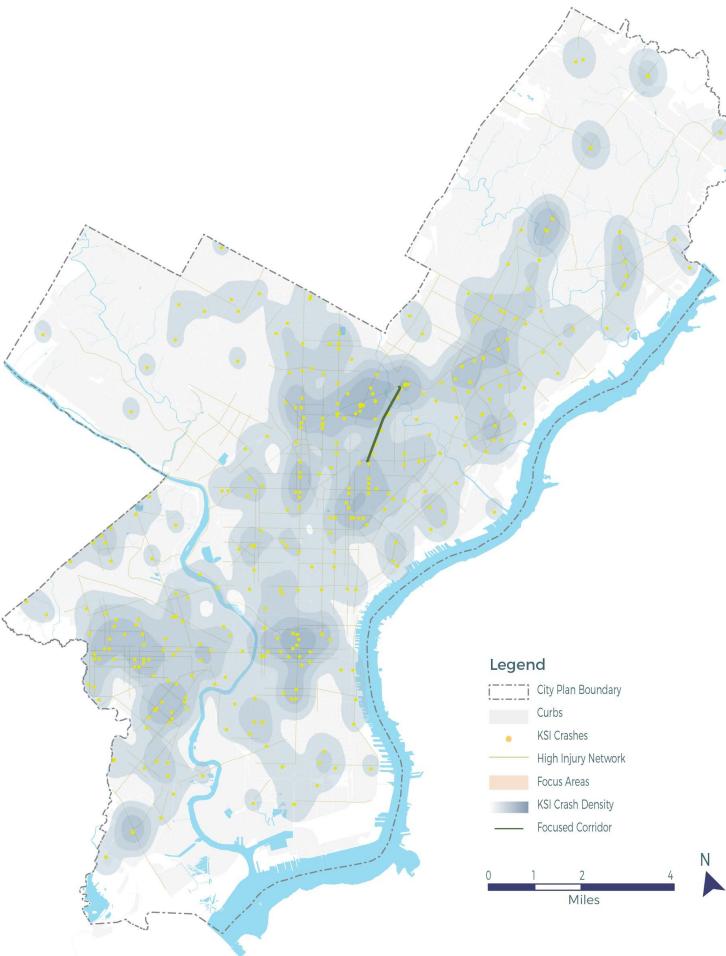


Strategy:Road function transition

Designate sections of road or entire blocks for student drop-off or pick-up only.

Road should be clearly marked using delineators and “school use only” sign.





WHEN: Nighttime Crashes

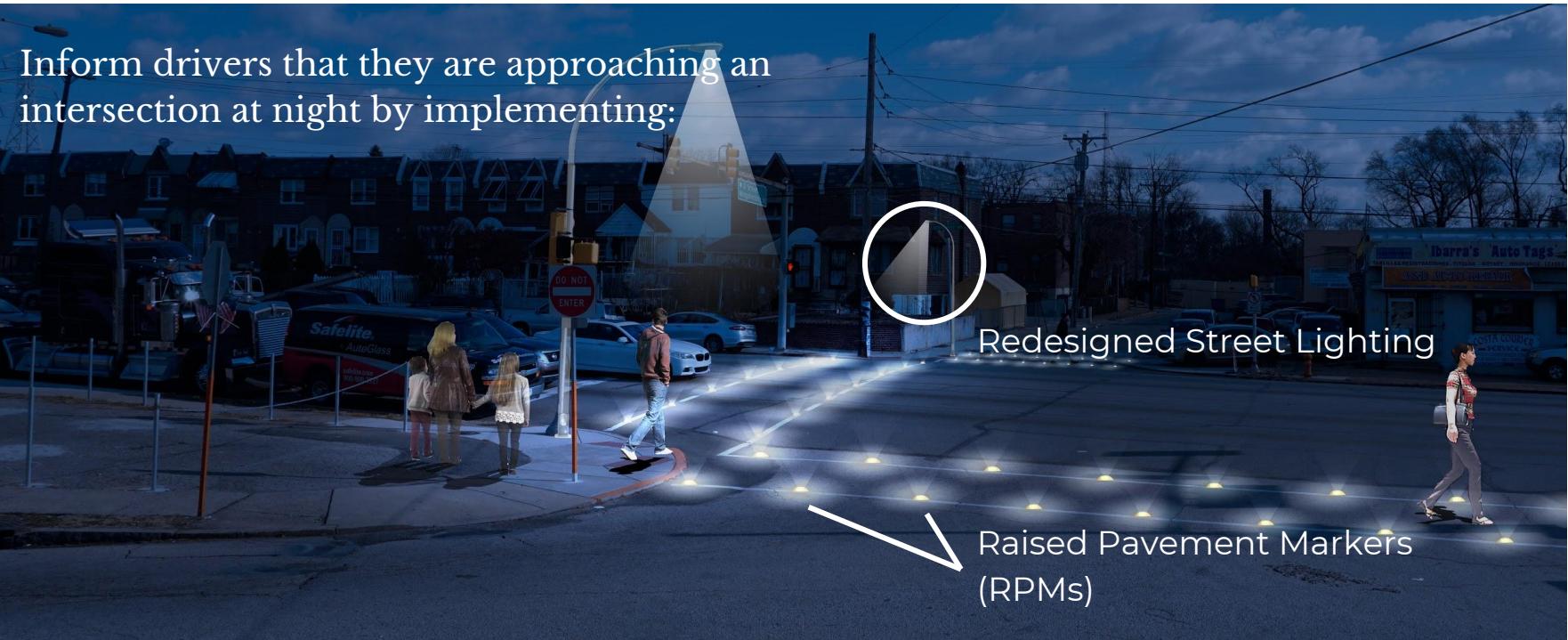
Driver behavior, not necessarily lighting:

Less than **2 percent** of KSI crashes happen after dark where there are no street lights.

Driver behavior changes at night:

- **150 percent** increase in speeding
- **300 percent** increase in DUI

Strategies: Nighttime Crashes



Strategy:Raised Pavement Markers

Inexpensive to install

Highlights stopping lines
or pedestrian crossings

Newer models are
LED-equipped for better
visibility

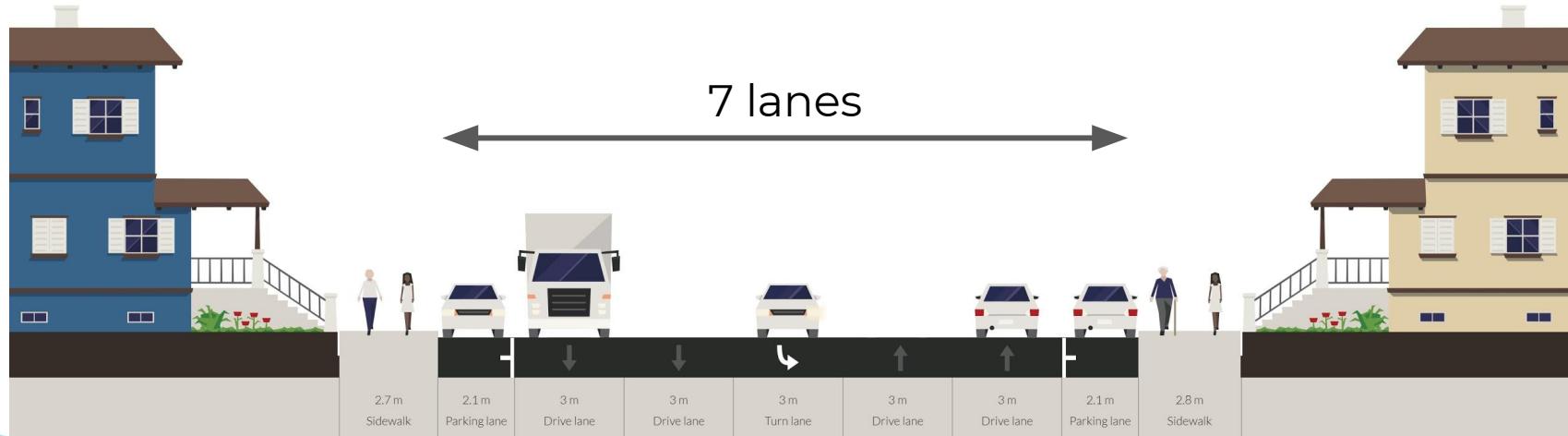


Strategy:Intersection Lighting

Site: Whitaker Avenue

1+ nighttime KSI at every major intersection

Intersections missing street lighting



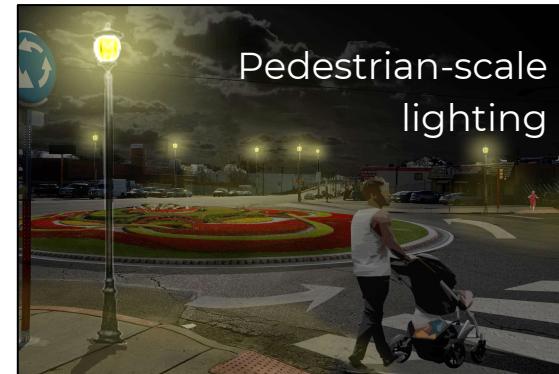
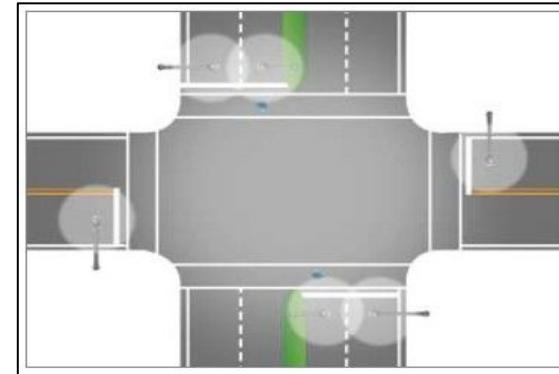
Strategy: Intersection Lighting

Techniques to increase intersection visibility and help drivers recognize dangerous intersections:



Source: FHWA

One street light **per**
corner



Pedestrian-scale
lighting

HOW



How can the city create a new culture of safety?

Source: Temple University



A black rectangular graphic featuring a white hand icon inside a hexagon at the top. Below it is a yellow rectangular box containing the text "STOP FOR PEDESTRIANS" in large, bold, black capital letters. Underneath this, in a smaller white font, is the text "41% of Philadelphians killed in crashes are pedestrians." At the bottom, there are two logos: "VISION ZERO" on the left and "City of Philadelphia" on the right, separated by a vertical line.



A photograph showing a man in a blue shirt holding a young child. A woman in a dark jacket is standing next to him, holding a baby. They appear to be on a city street. In the foreground, a person's hand is visible on the steering wheel of a car, suggesting the view from inside the vehicle. A yellow banner across the middle of the photo contains the text "WE MEET IN THE STREET".

Source: Vision Zero Philadelphia, City of Philadelphia, Office of Transportation, Infrastructure, and Sustainability

HOW

The “Safety Six” Engagement Item 1.3

1. Reckless/careless driving
2. Red light- and stop sign-running
3. Driving under the influence
4. Failure to yield
5. Illegal parking
6. Distracted driving

HOW

New York City
Vision Zero
“Consumer Stages”

2014
Awareness

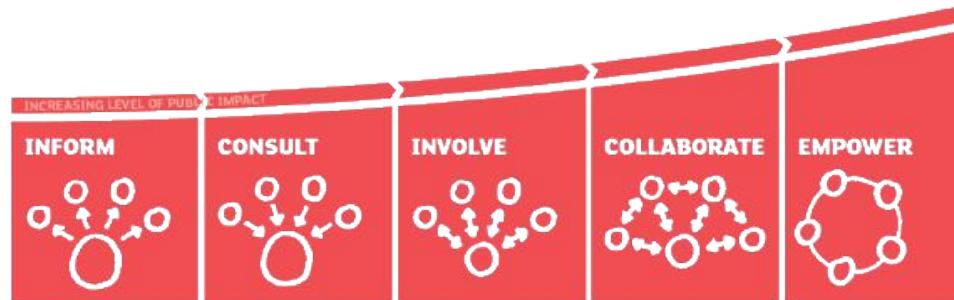
2015
Familiarity

2016
Action

HOW

IAP2

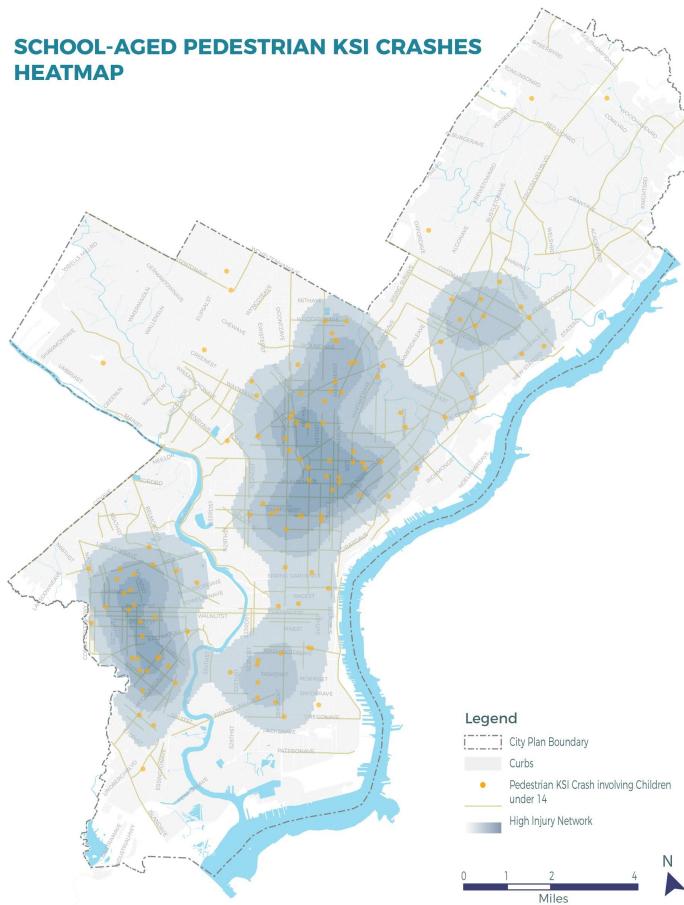
*“Spectrum of Public
Participation”*



Source: International Association of Public Participation

SCHOOL-AGED PEDESTRIAN KSI CRASHES HEATMAP

HOW



Strategies

Immediate:

Dedicated Vision Zero
communications role

Ongoing:

Formal advisory and support
roles to the Task Force

Ongoing:

Measure public support for and
knowledge of Vision Zero

Strategy: Dedicated Vision Zero communications role

Enable engagement to be a deep process that goes from the ground up and the top down.

Communications roles exist in oTIS, and grant funding is available.

Strategy: Dedicated Vision Zero communications role

Enable engagement to be a deep process
that goes from the ground up and the
top down.

adapted from the
“Spectrum of Prevention”

Legislation
and Legal

Operations
and Praxis

Community
Leadership

Individual
Knowledge

Strategy: Dedicated Vision Zero communications role

Legislation and Legal



Strengthen the (extra-mayoral) authority of Vision Zero in law or within city agencies

Maintain relationships with legislative bodies (e.g. city council)

Strategy: Dedicated Vision Zero communications role



Operations
and Praxis

Support the institutionalization of Vision Zero within city agencies

Collection and distribution of data appropriate for building support (e.g. demographic data)

Strategy: Dedicated Vision Zero communications role

Serve as liaison for advisory and support roles in the Task Force

Foster support for Vision Zero in Philly's strong network of non-profit organizations

Community Leadership



Source: Philadelphia Print Works

Strategy: Dedicated Vision Zero communications role

Continue Safety Six and other marketing campaigns

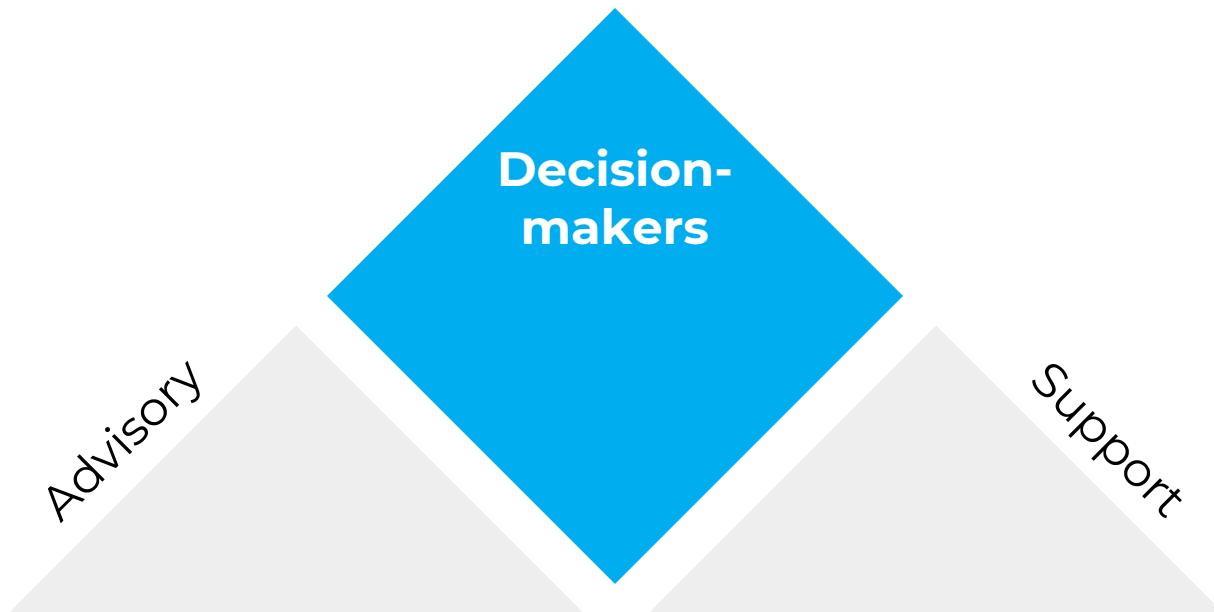
Measure Philadelphians' knowledge of and support for Vision Zero



Individual Knowledge

Strategy: Formal Task Force roles

Defining roles empowers
smaller players.



We pledge,

as the Vision Zero Task Force, to incorporate the Vision Zero Action Plan goals, principles, and values into everything our departments, agencies, and organizations do. We commit to zero fatalities by 2030.



Michael DiBernardis
Managing Director



Michael Carroll, P.E. [Chair]
Office of Transportation and Infrastructure Systems



Richard Ross
Philadelphia Police Department



Kelley Yemani
Office of Complete Streets



Anne Madelon
Department of Planning &
Development



Richard Montanez, P.E.
Department of Streets



David Perri, P.E.
Department of Licenses &
Inspections



Dr. Thomas Farley
Department of Public Health



Louis Belmonte, P.E.
Pennsylvania Department
of Transportation (PennDOT)



Kathy Desmond
People's Emergency Center



Dr. William R. Hite
School District of Philadelphia



Michael Banks
African American Chamber of
Commerce



Scott Sauer
Southeastern Pennsylvania
Transportation Authority (SEPTA)



Nilda Iris Ruiz
Asociación Puertorriqueños
en Marcha, Inc. (APM)



Rick Sauer
Philadelphia Association of
Community Development
Corporations (PACDC)

Source: Vision Zero Action Plan

Asociación Puertorriqueños en Marcha



AFRICAN-AMERICAN
CHAMBER OF COMMERCE
Pennsylvania ♦ New Jersey ♦ Delaware

We pledge,

as the Vision Zero Task Force, to incorporate the Vision Zero Action Plan goals, principles, and values into everything our departments, agencies, and organizations do. We commit to zero fatalities by 2030.

Michael DiBerardinis
Managing Director

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Office of Transportation and Infrastructure Systems

Richard Ross, Jr.
Philadelphia Police Department

Kelley Yerem
Office of Complete Streets

Anne Madelon
Department of Planning &
Development

Richard Montanez, P.E.
Department of Streets

David Perri, P.E.
Department of Licenses &
Inspections

Dr. Thomas Farley
Department of Public Health

Louis Belmonte, P.E.
Pennsylvania Department
of Transportation (PennDOT)

Kathy Desmond
People's Emergency Center

Dr. William R. Hite
School District of Philadelphia

Michael Banks
African American Chamber of
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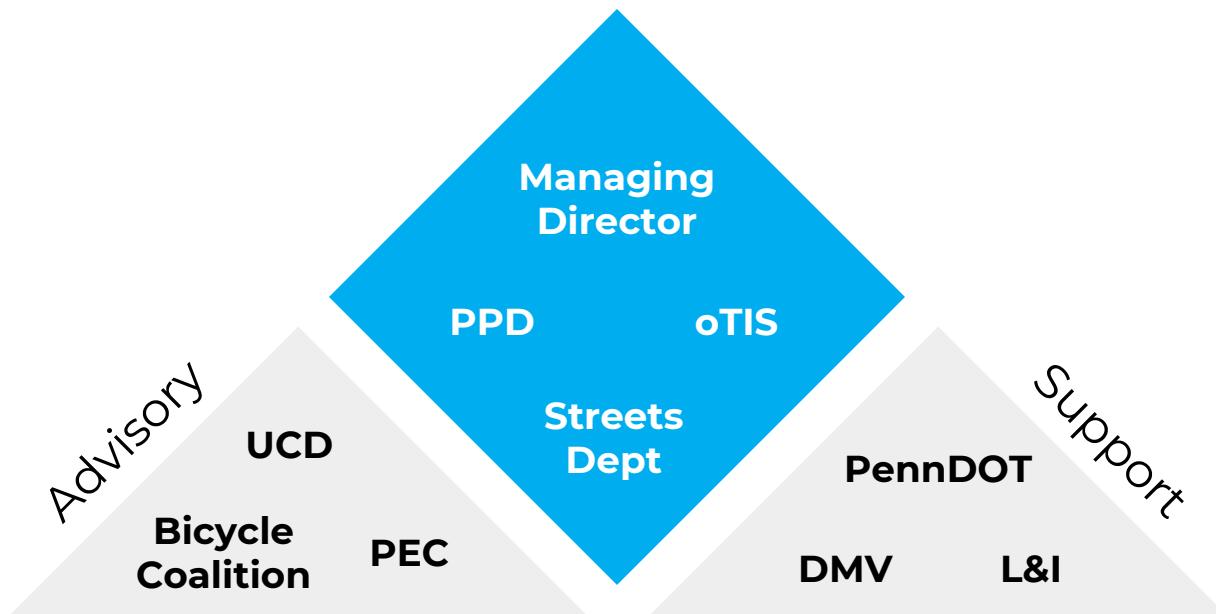
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Asociación Puertorriqueños
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Rick Sauer
Philadelphia Association of
Community Development
Corporations (PACDC)



University City District

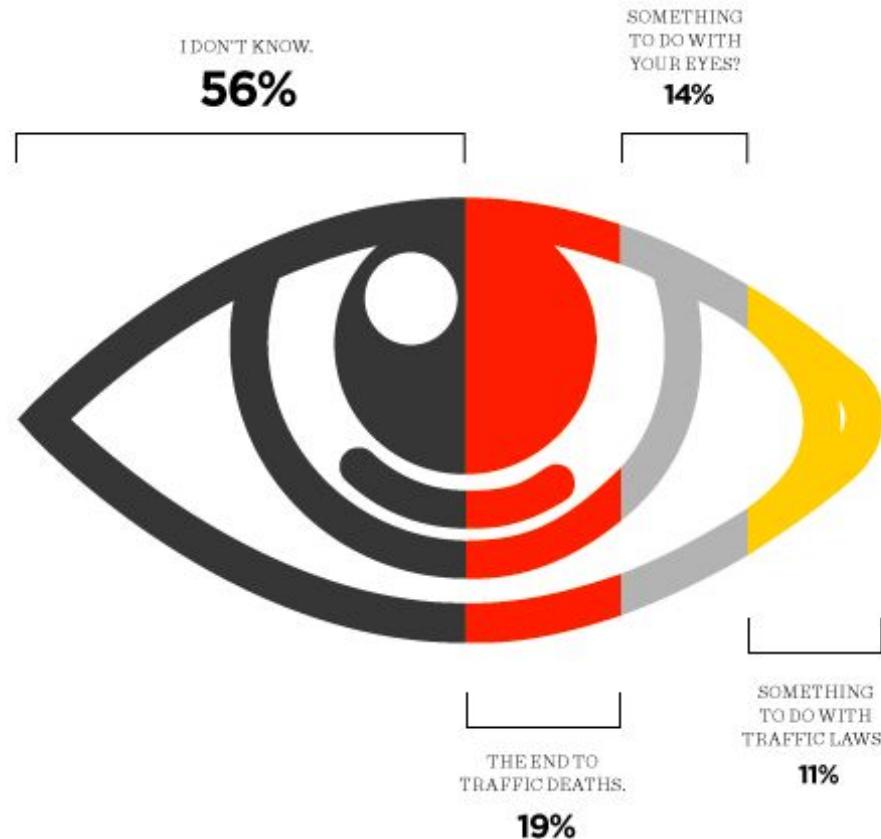
Strategy: Formal Task Force roles



Strategy: Measure public support

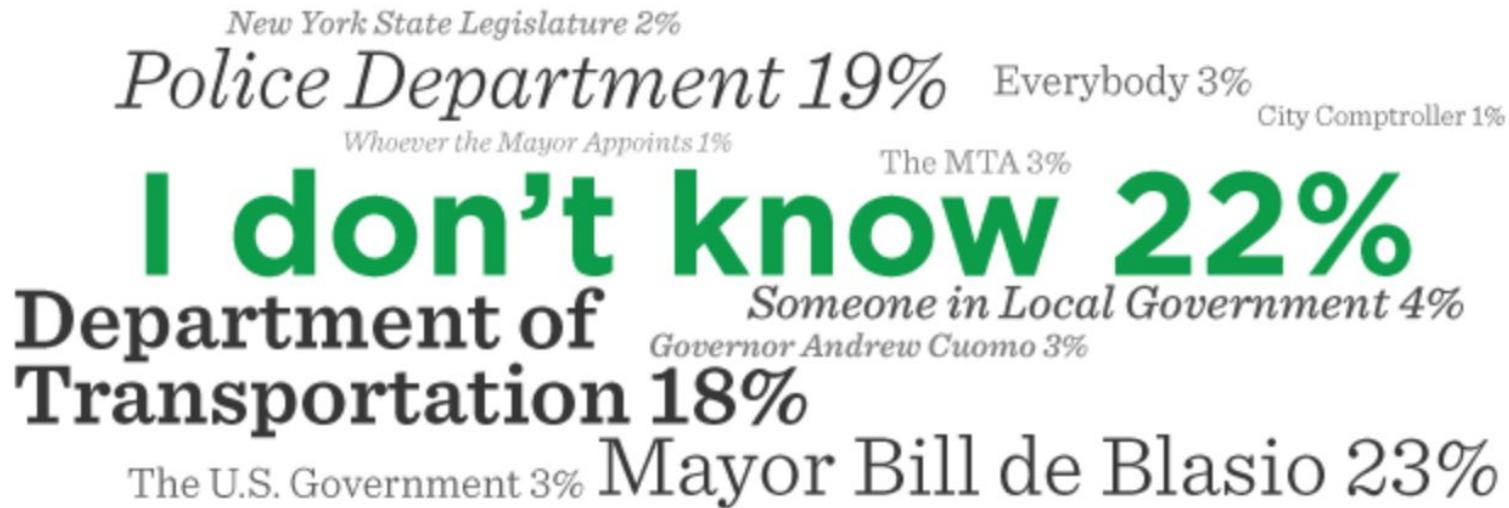
We don't know what Philadelphians currently know and need to know about Vision Zero.

Transportation
Alternatives'
"100 Person Poll"



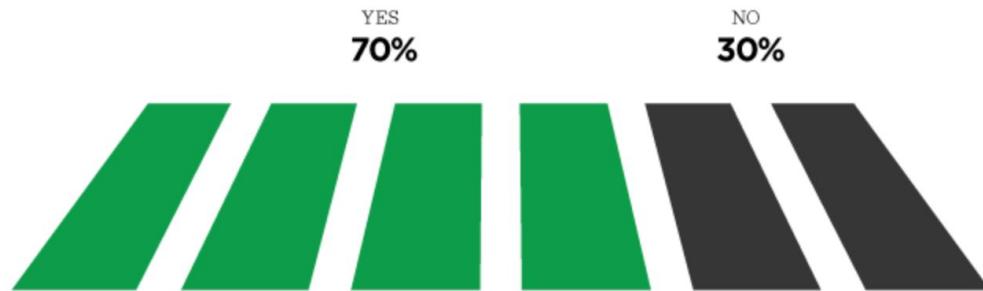
Source: Transportation Alternatives

Who is in charge of keeping New York City streets safe?



Transportation
Alternatives'
"100 Person Poll"

**"I feel
threatened
crossing the
street"**

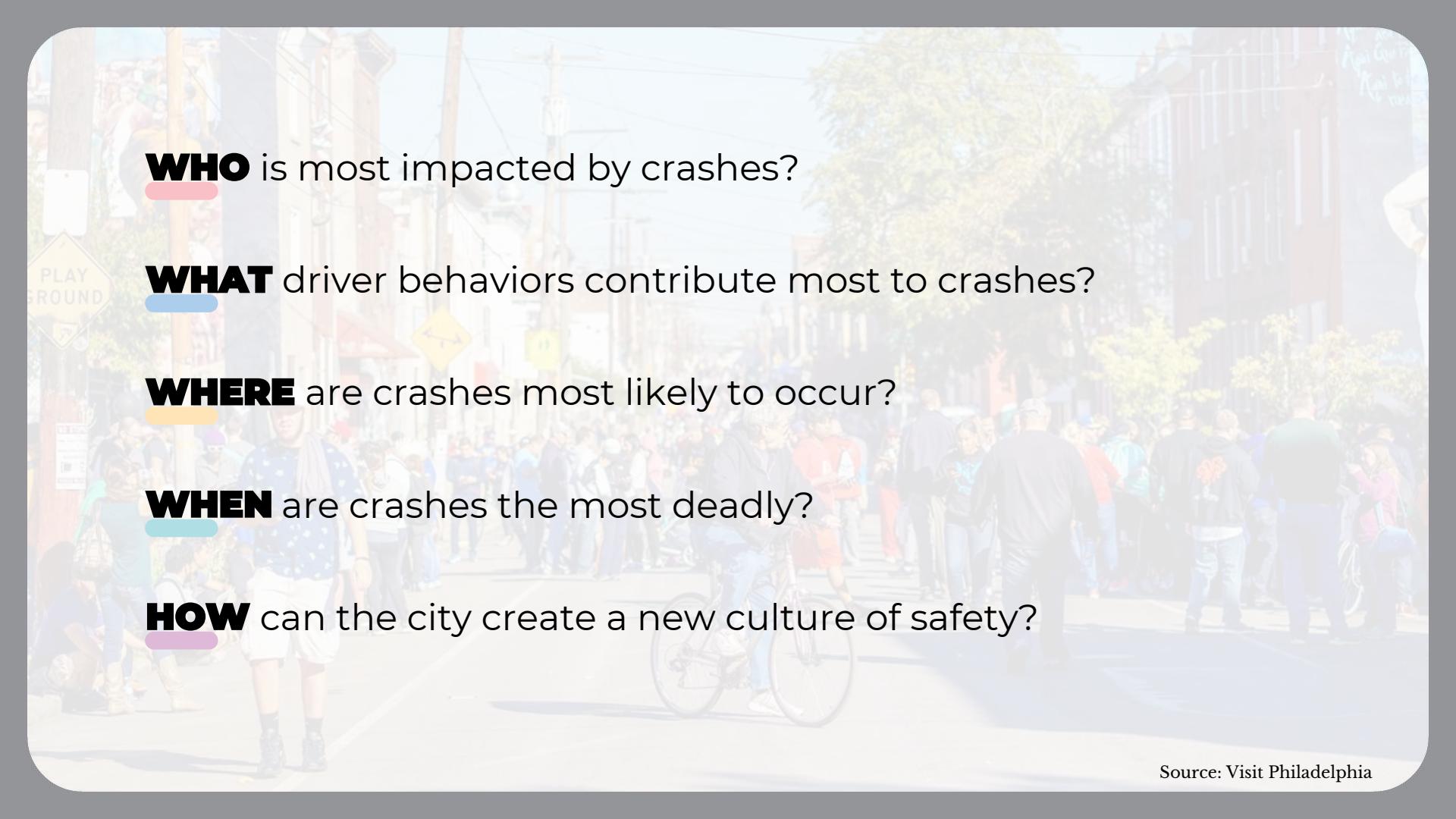


YES
80%



NO
20%

**"I support
red light
enforcement
cameras"**



WHO is most impacted by crashes?

WHAT driver behaviors contribute most to crashes?

WHERE are crashes most likely to occur?

WHEN are crashes the most deadly?

HOW can the city create a new culture of safety?



Source: Visit Philadelphia