ADOPTING PROACTIVE INDICATORS OF PEDESTRIAN AND BICYCLIST SAFETY

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Outline

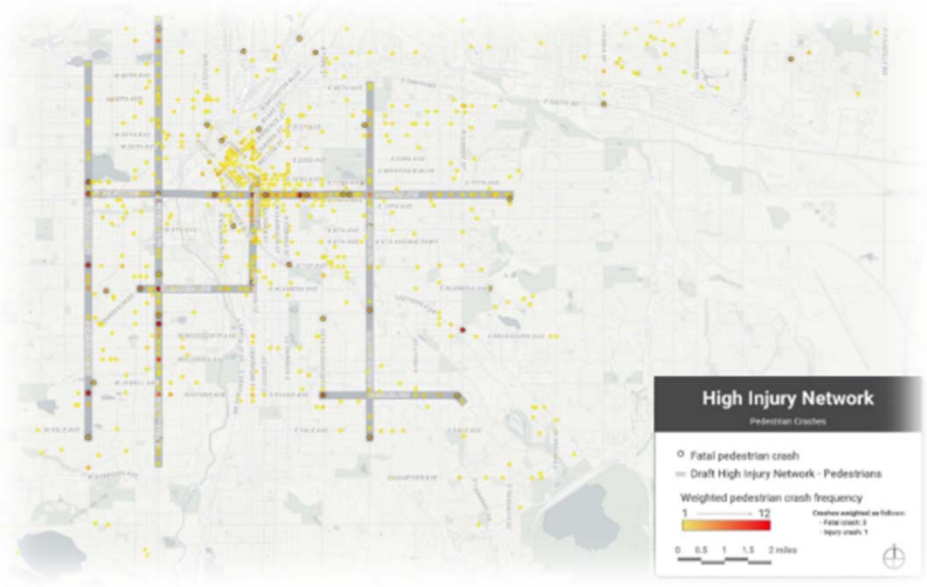
1) Proactive Safety
2) Applications
   - Equity
   - Siting
3) Case Studies

Proactive Pedestrian & Bicycle Safety

Reactive Traffic Safety

High Injury Network

Denver Vision Zero



High Crash Corridors & Intersections

Denver Regional Council of Governments

Street	Segment	Crashes	Length (mi)	Crashes/Mile
Colfax Ave	Union St to Buckley Rd	418	18.0	23.2
Federal Blvd	Bowles Ave to 104th Ave	233	18.9	12.4
Broadway	C-470 to Brighton Blvd	213	13.6	15.6
Sheridan Blvd	Hampden Ave to 104th Ave	133	16.1	8.3
Colorado Blvd	Hampden Ave to I-70	108	8.8	12.3
Wadsworth Blvd	Bowles Ave to 88th Ave	108	17.3	6.2
Mississippi Ave	Wadsworth Blvd to Broadway & Parker Rd to Buckley Rd	99	10.6	9.3
Peoria St	Parker Rd to 56th Ave	96	9.6	10.0
Alameda Ave	Union St to University Blvd	95	9.3	10.2
Total		1,503		

Reactive Traffic Safety

High Injury Network

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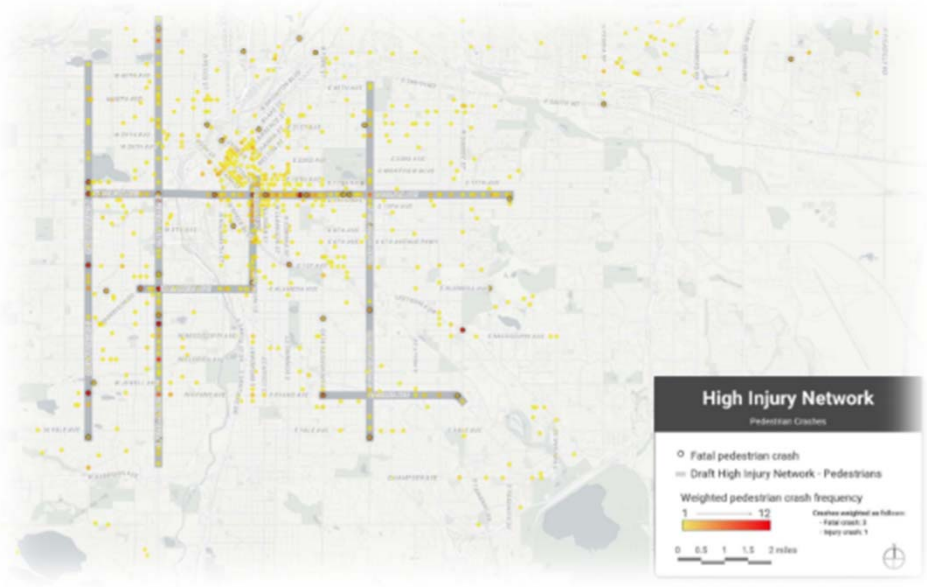

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ALOHA
PLAZA
Hunter Rd

ALOHA
PLAZA

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Hunter Rd

ALOHA
PLAZA

Suppressed Trips

Steps

1) Factors suppressing walking/biking

2) Network analyses

Research Questions

1) Which roadway design characteristics are suppressing walking/biking?

2) How many children are impacted?

3) How are their routes impacted?

4) How many safety issues are being neglected?

Methods

Yes
No
Yes
No
Yes
No
Yes
No
occurred, and

Child
School
Barrier
Routes
Shortest Path (2074')
Weighted Distance (3004')
0
500
1,000
2,000
Feet
N
CARSON WAY
BEDFORD CT
ZION CT
ABILENE ST
OLMSTED DR
E 54TH AVE
BLACKHAWK WAY
CRYSTAL ST
Ford
(Barney L)
Park

Survey

Would you allow your children to use this roadway **on foot** to get to school?

35 mph
2 Lanes
No Sidewalks
Low Volume

Would you allow your children to use this roadway **on bike** to get to school?

25 mph
3 Lanes
Bike Lanes
High Volume

No
Yes, with trusted adult supervision
Yes, without adult supervision

Network Analyses

Results

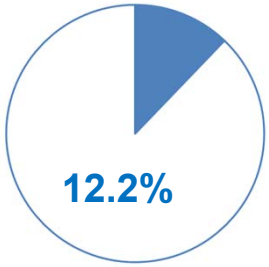
** p<0.10*
*** p<0.05*
**** p<0.01*

		Walk R^2 = 0.977; n =20	**Bike** R^2 = 0.9509; n = 20
Intercept		-0.260*	-0.703***
Vehicle Speed	35 mph	0.995***	0.644***
	45 mph	1.868***	0.901***
Lanes	3 lanes	0.495***	0.618***
	4 lanes	0.597***	1.166***
Facilities		-2.584***	-0.819***
Vehicle Volume		0.770***	1.111***

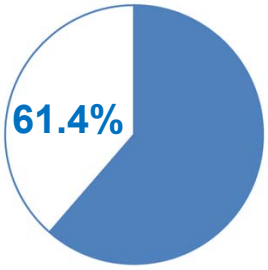
How many children encounter roads perceived as unsafe?

50% Suppression

Walk



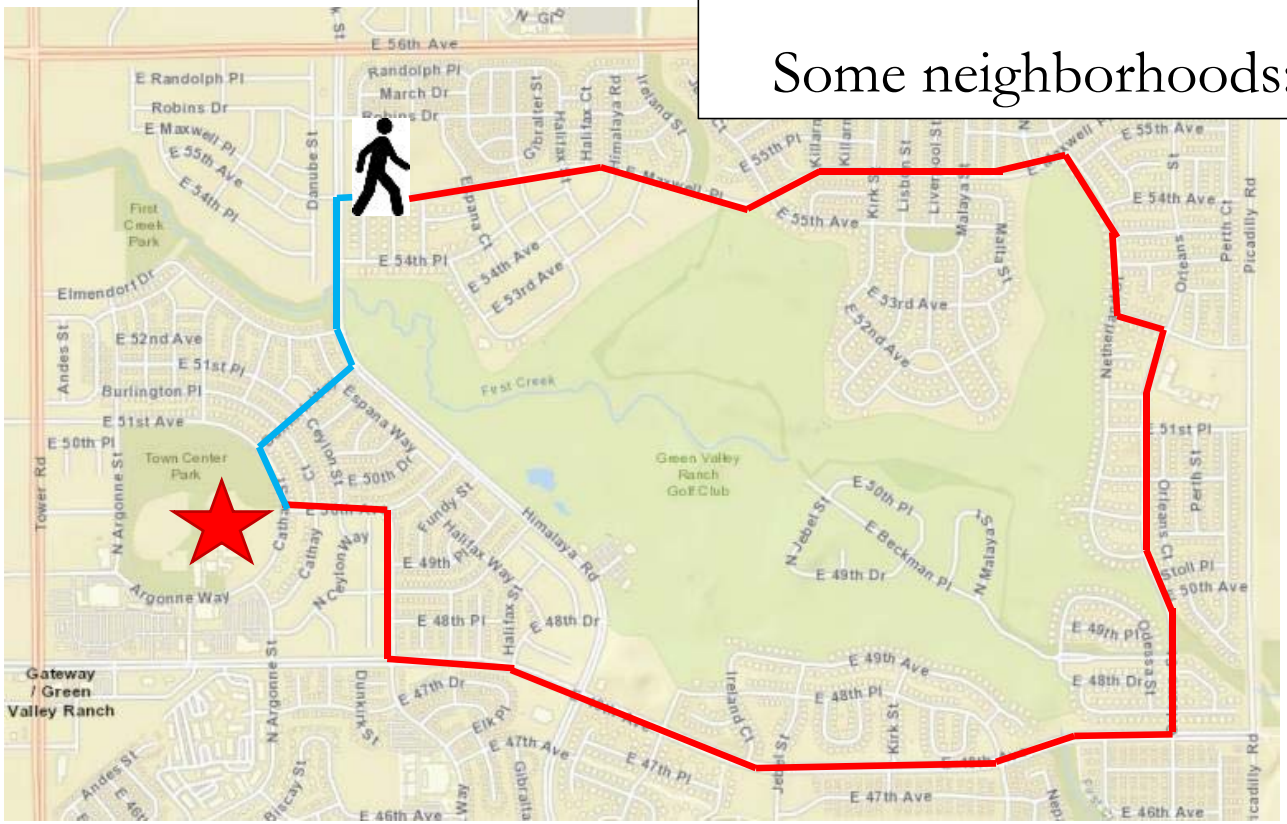
Bike



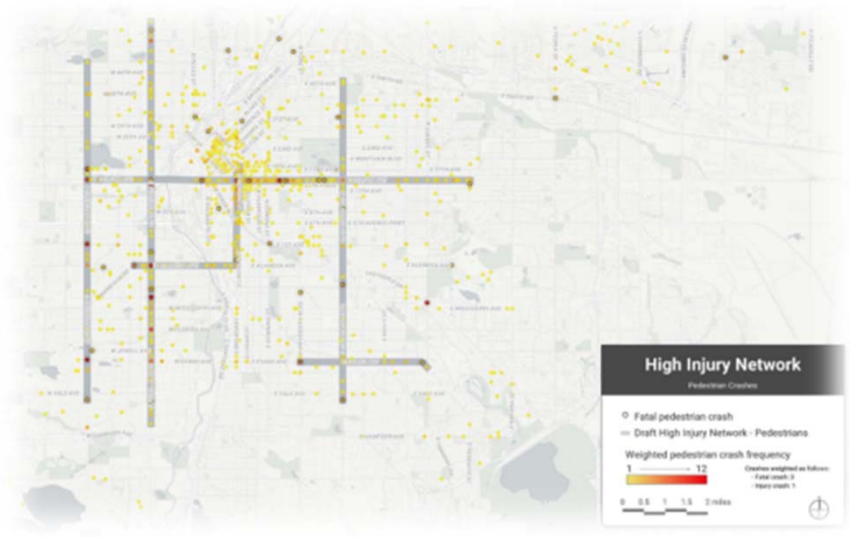
How are routes altered?

Walk: 300 feet **Bike:** 1,100 feet

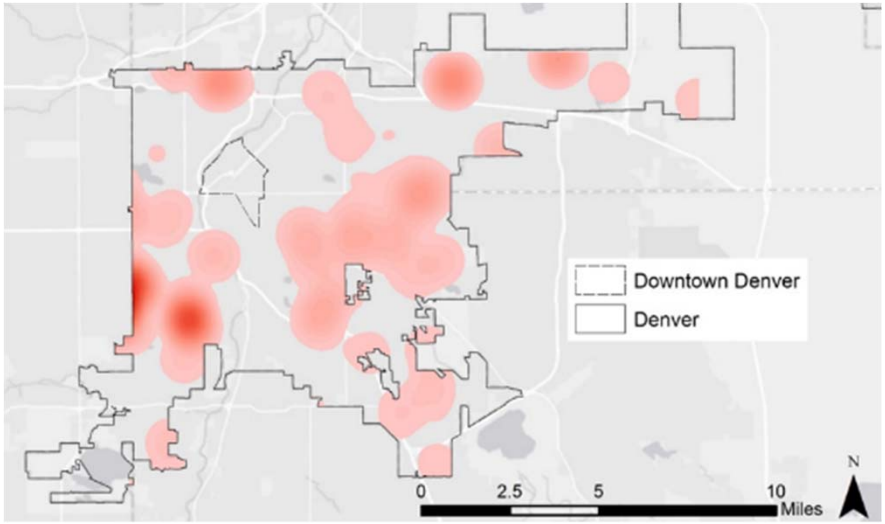
Some neighborhoods: **5,200 feet!**



Safety Comparison



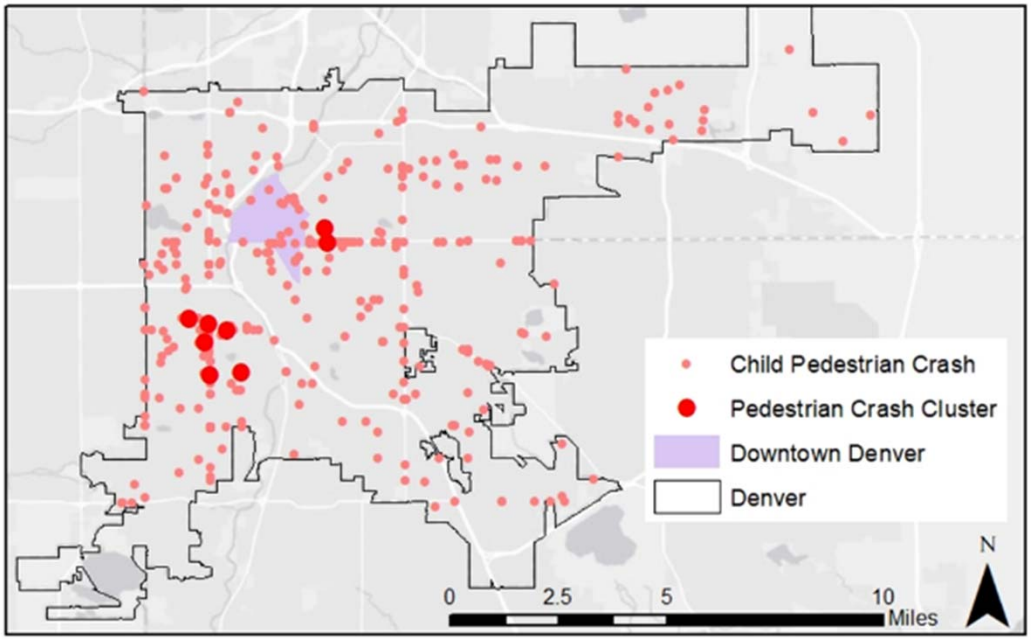
VS.



Reactive

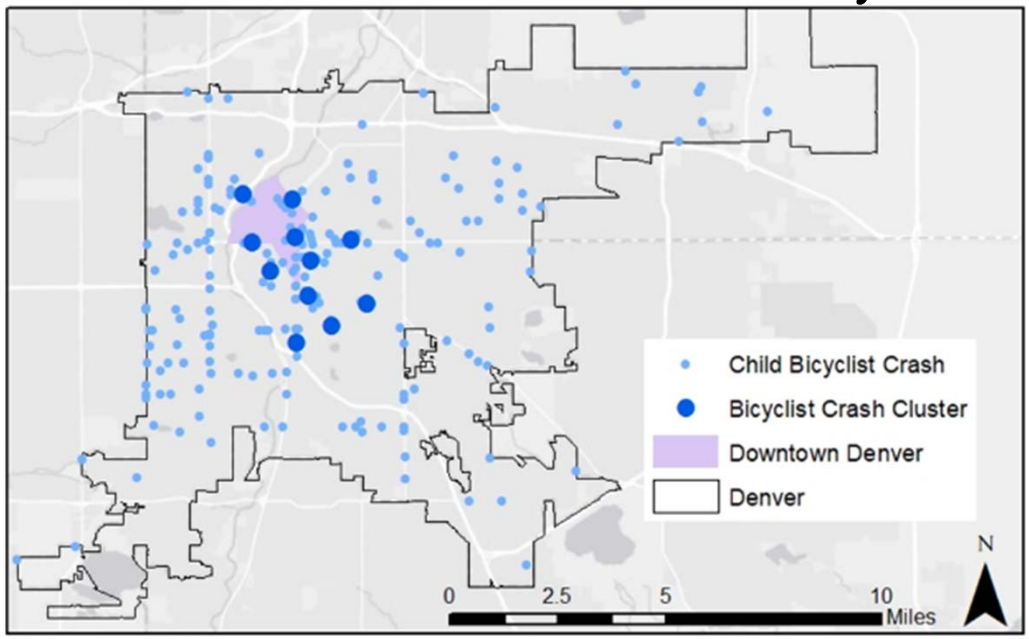
Proactive

Reactive: Cluster Analysis

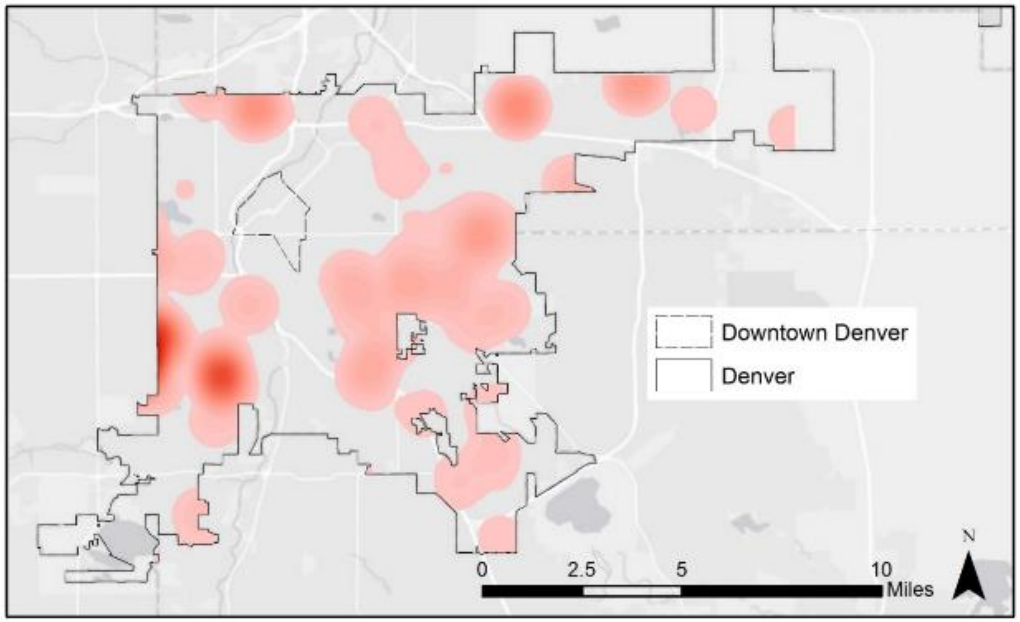


Pedestrian

Bicyclist

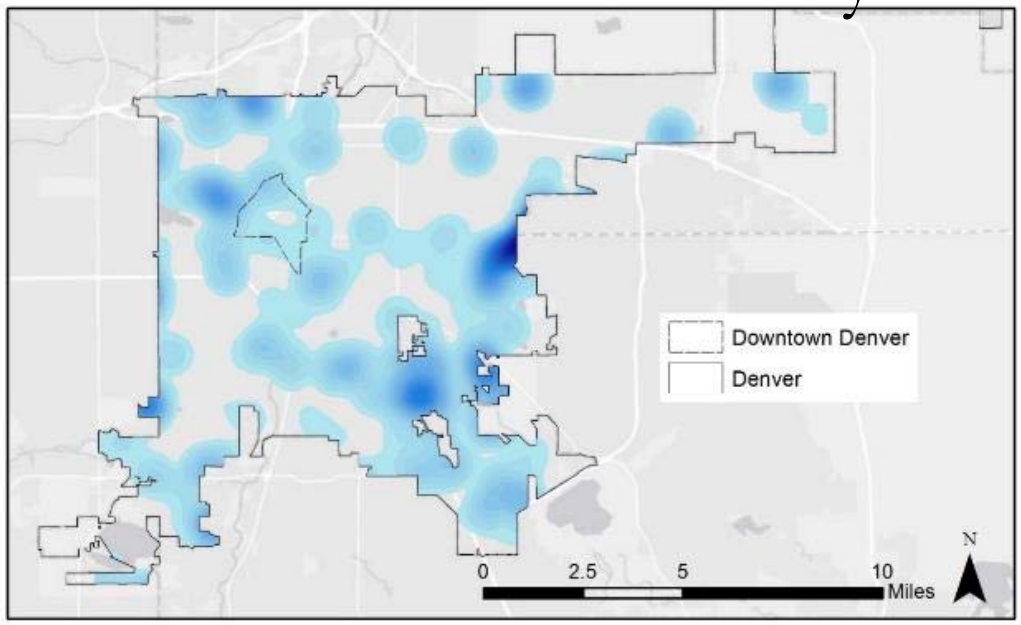


Proactive Results

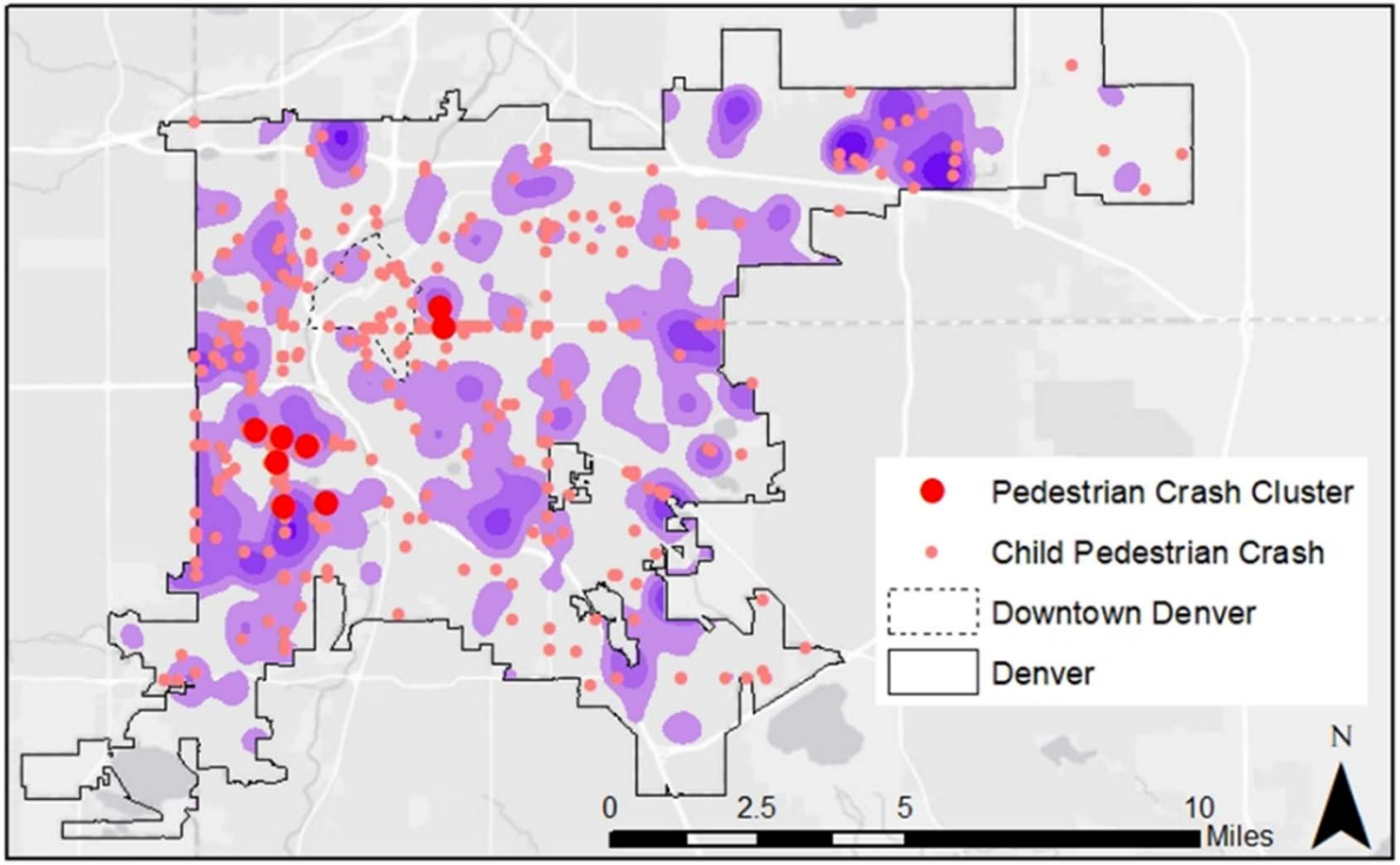


Pedestrian

Bicyclist



Pedestrian


Pedestrian Crash Cluster
Child Pedestrian Crash
Downtown Denver
Denver
N
0
2.5
5
10
Miles

Equity Analysis

Pedestrian

	Child Crashes				Children Encountering Roads Perceived as Unsafe			
	Coeff.	R^2	Std. Error	Intercept	Coeff.	R^2	Std. Error	Intercept
Income	-2.25***	0.06	0.00	0.02	8.79	0.00	0.29	0.18
Education	-3.38***	0.12	0.01	0.01	-23.45	0.02	0.28	0.18
Hispanic	1.40***	0.06	0.01	0.01	19.17**	0.03	0.28	0.16
Black	0.15	0.00	0.01	0.01	62.28***	0.05	0.28	0.16

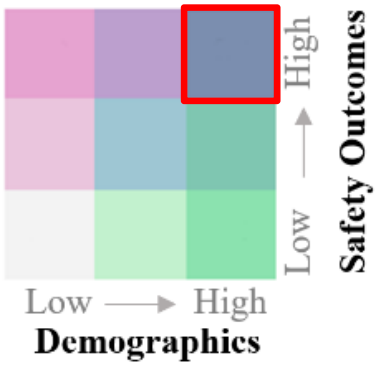
Equity Analysis

Bicyclist

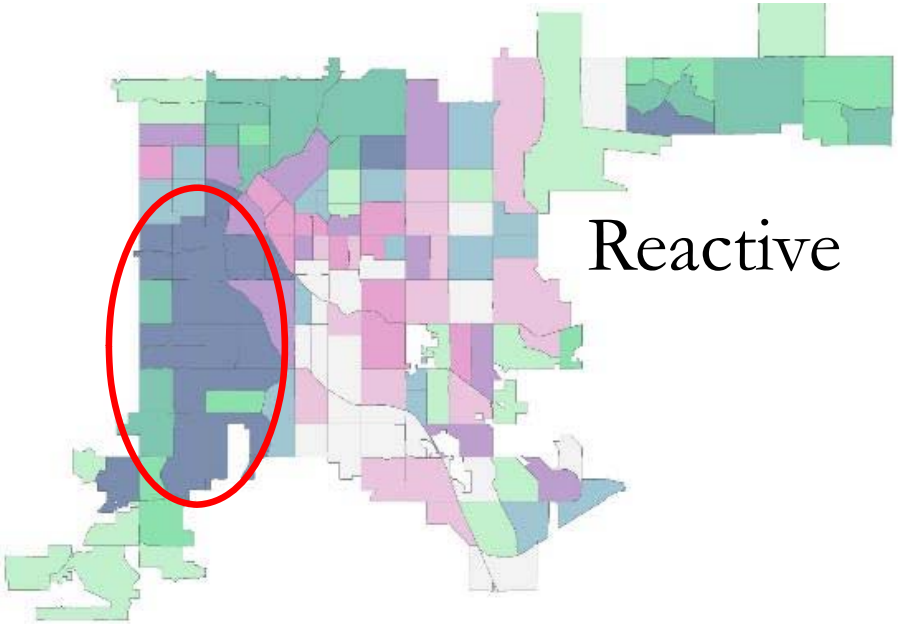
	Child Crashes				Children Encountering Roads Perceived as Unsafe			
	Coeff.	R^2	Std. Error	Intercept	Coeff.	R^2	Std. Error	Intercept
Income	-1.13**	0.04	0.01	0.01	-54.59	0.02	0.62	1.06
Education	-0.56	0.01	0.01	0.01	-216.43***	0.23	0.55	0.56
Hispanic	0.16	0.00	0.01	0.01	132.27***	0.25	0.54	0.49
Black	-1.28*	0.02	0.01	0.01	68.72	0.01	0.62	0.81

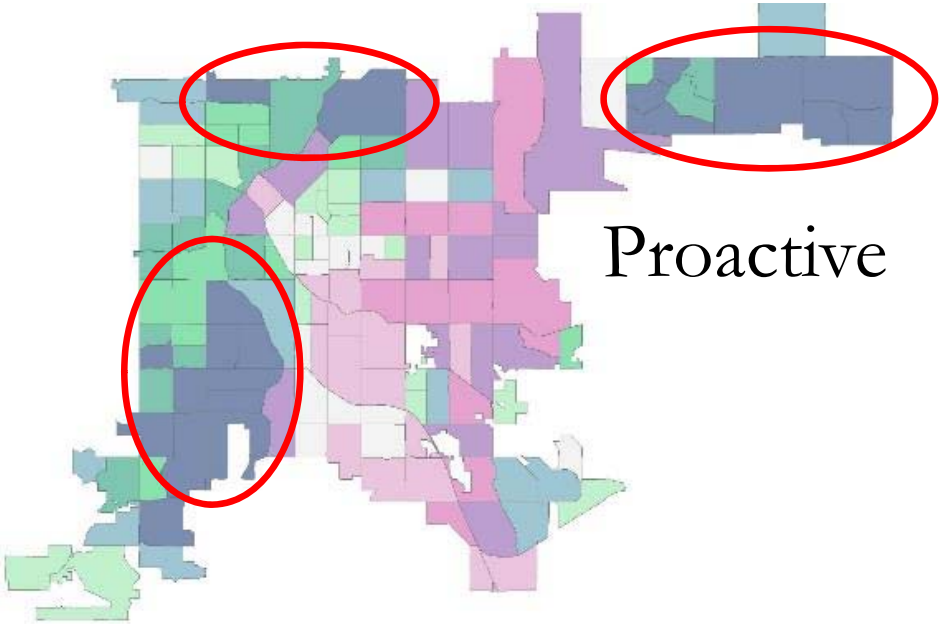
Equity Analysis

Pedestrian



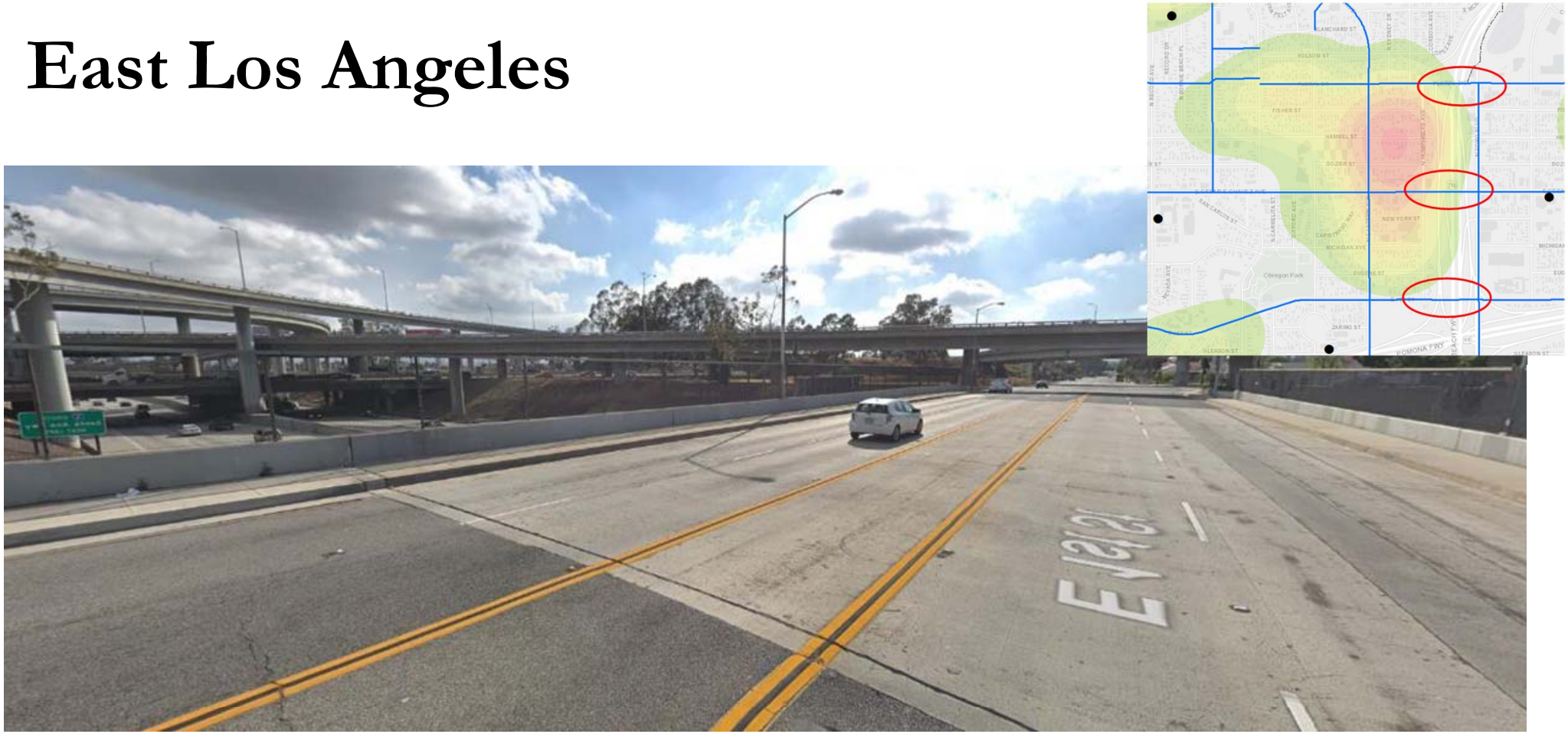
Hispanic

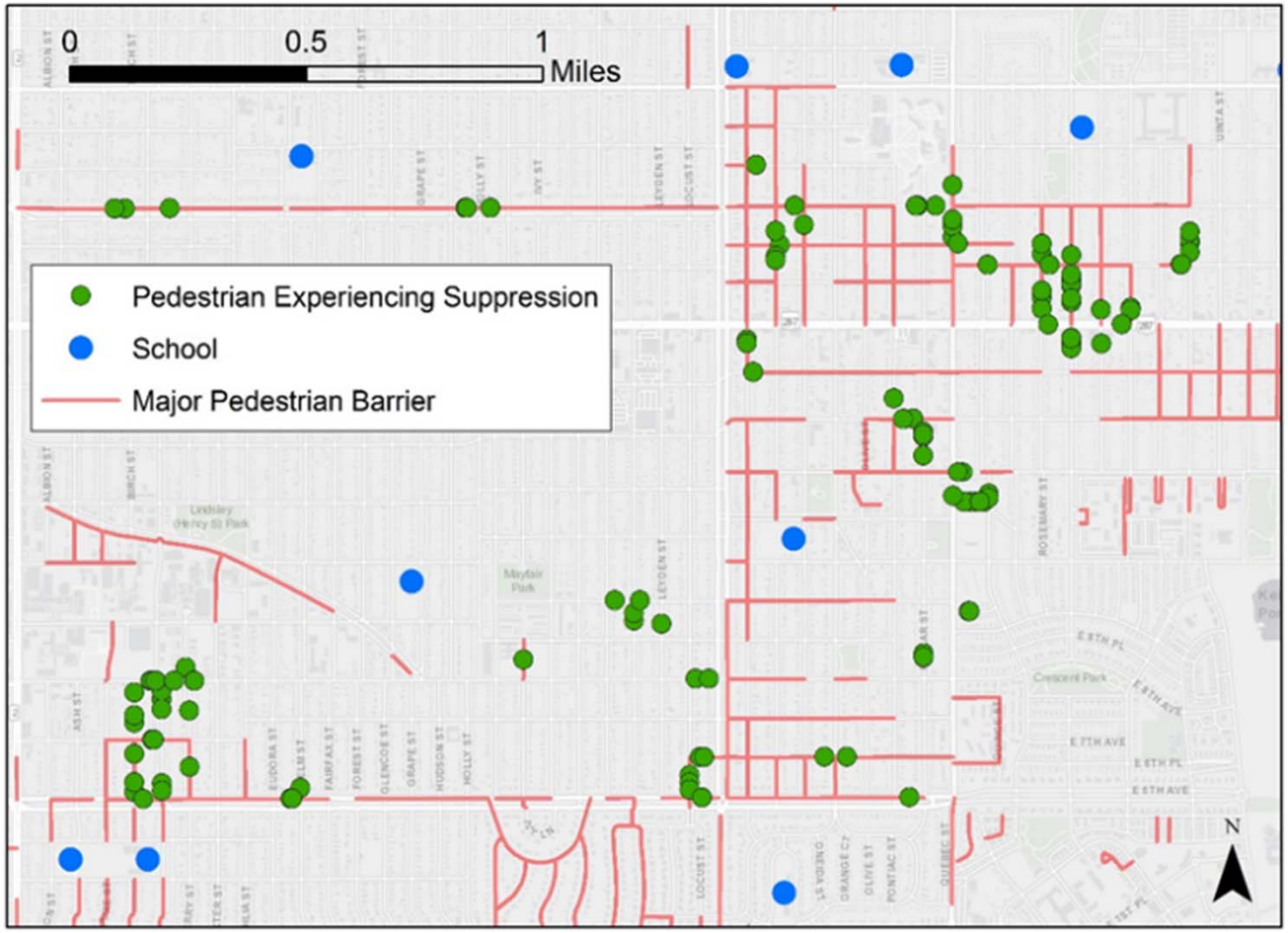




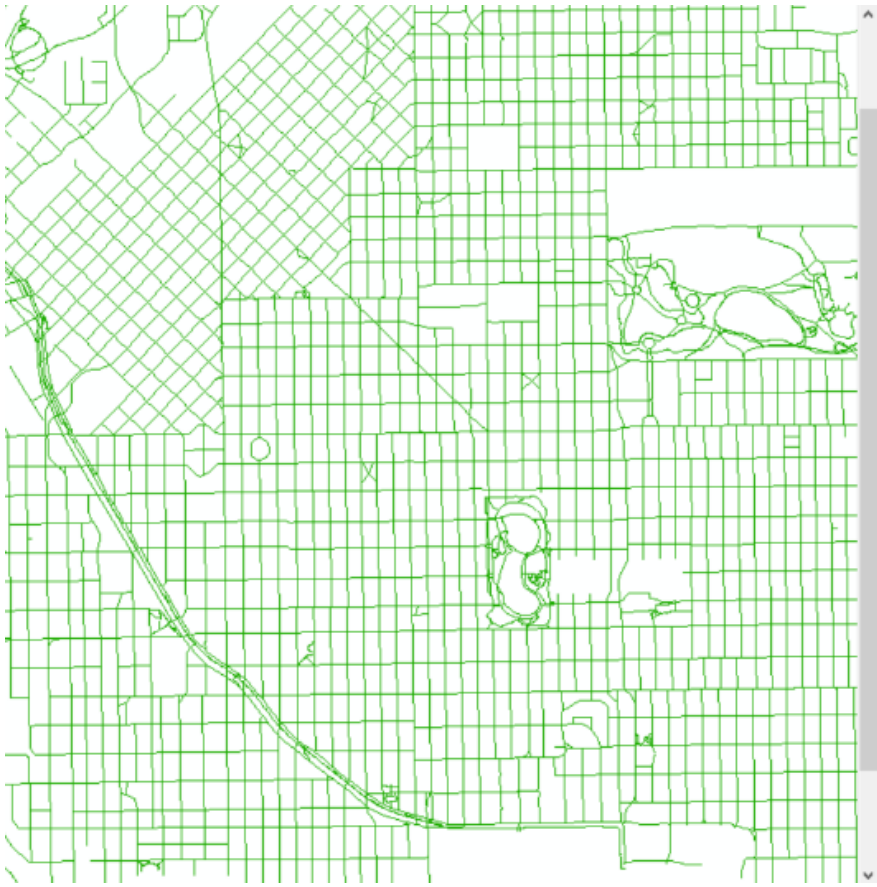
School Siting

East Los Angeles




0
0.5
1
Miles
Pedestrian Experiencing Suppression
School
Major Pedestrian Barrier
N

Application



Table

Roads

Speed	Lanes	Sidewalk	BikeLane	Volume
0	0	2	0	0
35	2	1	0	0
35	2	1	0	0
35	6	1	0	1
25	2	0	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
25	2	2	0	0
0	0	2	0	0
35	6	2	0	1
25	2	2	0	0
25	2	0	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0
0	0	2	0	0

1

(0 out of 5055 Selected)

Child
School
Barrier
Routes
Shortest Path (2074')
Weighted Distance (3004')
BEDFORD CT
CARSON WAY
OLMSTED DR
E 54TH AVE
BLACKHAWK WAY
Ford (Barney L.) Park
0
500
1,000
2,000
Feet

THANK YOU!

Nick Ferenchak

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