HOUSTON
PUBLIC WORKS

ACHIEVING VISION ZERO IN HOUSTON

IAN HLAVACEK, PE

TRANSPORTATION & DRAINAGE OPERATIONS

PURPOSE

together we create a strong foundation for Houston to thrive

5 TO THRIVE VALUES

integrity | teamwork | ownership | communication | respect

SERVICE LINES

CAPITAL PROJECTS

CUSTOMER ACCOUNT SERVICES

HOUSTON PERMITTING CENTER

HOUSTON WATER

TRANSPORTATION AND DRAINAGE OPERATIONS

LEADERSHIP TEAM

CAROL ELLINGER HADDOCK, PE
DIRECTOR

ROEL GARCIA
CHIEF OF STAFF

ALANNA REED
DIRECTOR
COMMUNICATIONS

SAMIR SOLANKI, CPA
DIRECTOR
FINANCIAL MANAGEMENT SERVICES

MONICA VASQUEZ
ACTING DIRECTOR
GOVERNMENT RELATIONS

ERIC DARGAN
CHIEF OPERATING OFFICER

MICHAEL ERETI, PE
DIRECTOR
CAPITAL PROJECTS

VERONICA O. DAVIS, PE
DIRECTOR
TRANSPORTATION & DRAINAGE OPERATIONS

CHRIS BUTLER
DIRECTOR
HOUSTON PERMITTING CENTER

YVONNE FORREST
DIRECTOR
HOUSTON WATER

SHERRI WINSLOW
DIRECTOR
CUSTOMER ACCOUNT SERVICES

HOUSTON PUBLIC WORKS

TRANSPORTATION & DRAINAGE OPERATIONS

VERONICA O. DAVIS, PE
DIRECTOR
TRANSPORTATION & DRAINAGE OPERATIONS

Multimodal Safety & Design

Khang Nguyen
ASSISTANT DIRECTOR

Stormwater Operations

Johana Clark
SR. ASSISTANT DIRECTOR

Support Services

Tracy Samuels
ASSISTANT DIRECTOR

TranStar

Dinah Massie
EXCECUTIVE DIRECTOR

Traffic Operations

Fabio Capillo
ASSISTANT DIRECTOR

Street & Bridge Maintenance

Walter Hambrick
ASSISTANT DIRECTOR

Project Delivery

Mike Wahl
ASSISTANT DIRECTOR

Multimodal Safety & Design

Khang Nguyen, PE
ASSISTANT DIRECTOR

Road Safety Group

Ian Hlavacek, PE
Managing Engineer

Mobility, Engineering & NTMP

Ahmed Ghaly, PE
Managing Engineer

Urban Design Studio

Donald Buaku
Principal Planner

ROAD SAFETY GROUP

Multimodal Safety & Design

Ian Hlavacek, PE
Managing Engineer

Ped/Bike and Vision Zero

Lauren Grove
Senior Staff Analyst

Virginia Lynn
Transportation Planner I

Engineering Analysis

Syed Ali, PE
Supervising Engineer

Jaime Reddic
Graduate Engineer

Abdullatif Maani
Graduate Engineer

Traffic Count Group

Schools & Railroads

Janice Lakey
Community Outreach Coordinator

School & Railroad Group

Street Lighting

Martin Herrera
Senior Project Manager

Keri Hayes
Graduate Engineer

HOUSTON PUBLIC WORKS

VISION ZERO

Data and equity

VISION ZERO HIGH INJURY NETWORK

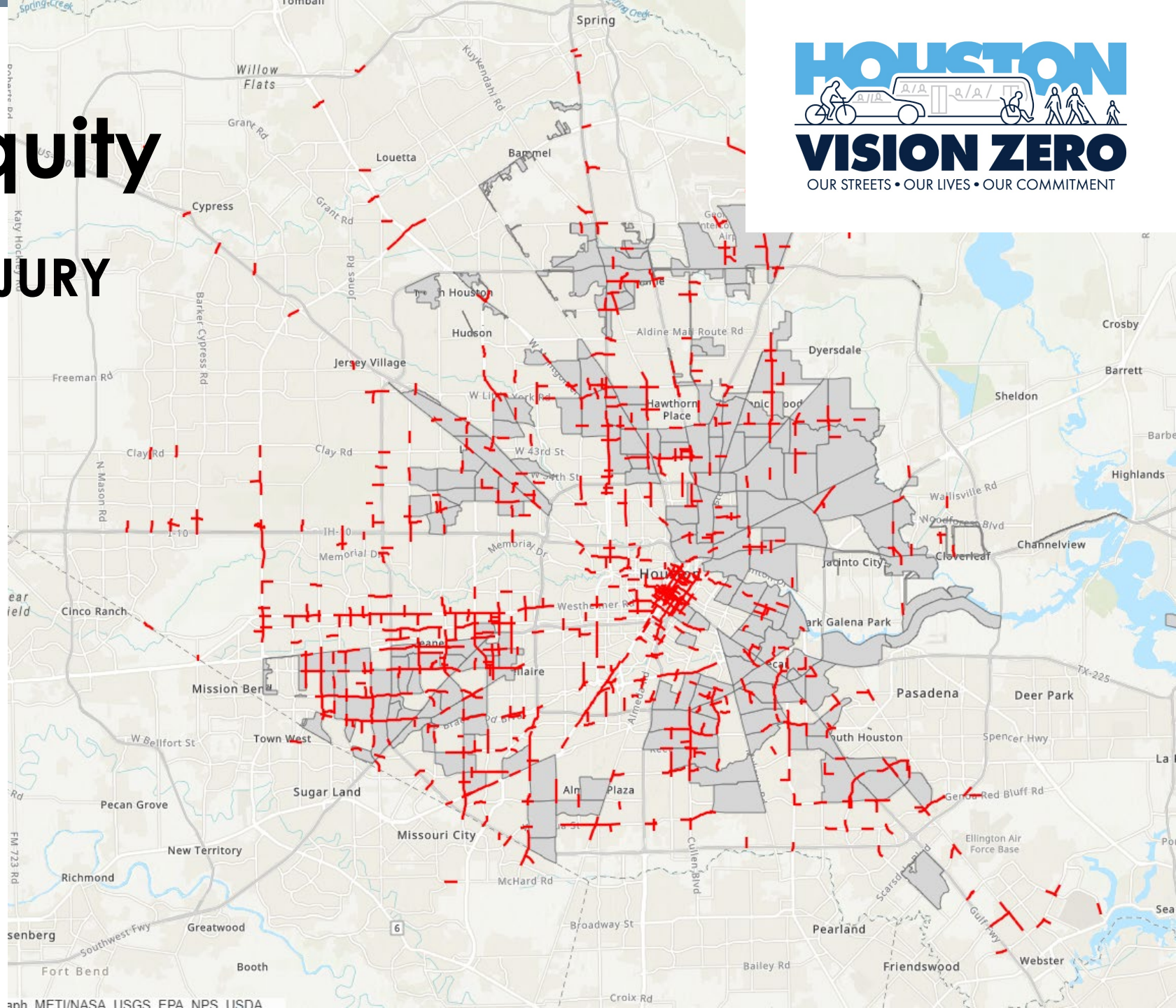
6% of streets account for **60%** of traffic deaths and serious injuries.

52% of High Injury Network streets are in more vulnerable communities who are mostly low-income and minority populations with no vehicle households.

http://www.houstontx.gov/visionzero/

HOUSTON PUBLIC WORKS

HOUSTON VISION ZERO
OUR STREETS • OUR LIVES • OUR COMMITMENT



WHAT CAN WE DO ABOUT IT?

1. Encourage slow speeds
2. Put peak hour in its place
3. Design for human psychology, not against it
4. The details matters

1. ALWAYS ENCOURAGE SLOW SPEEDS

SPEEDING: FORCE OF IMPACTS

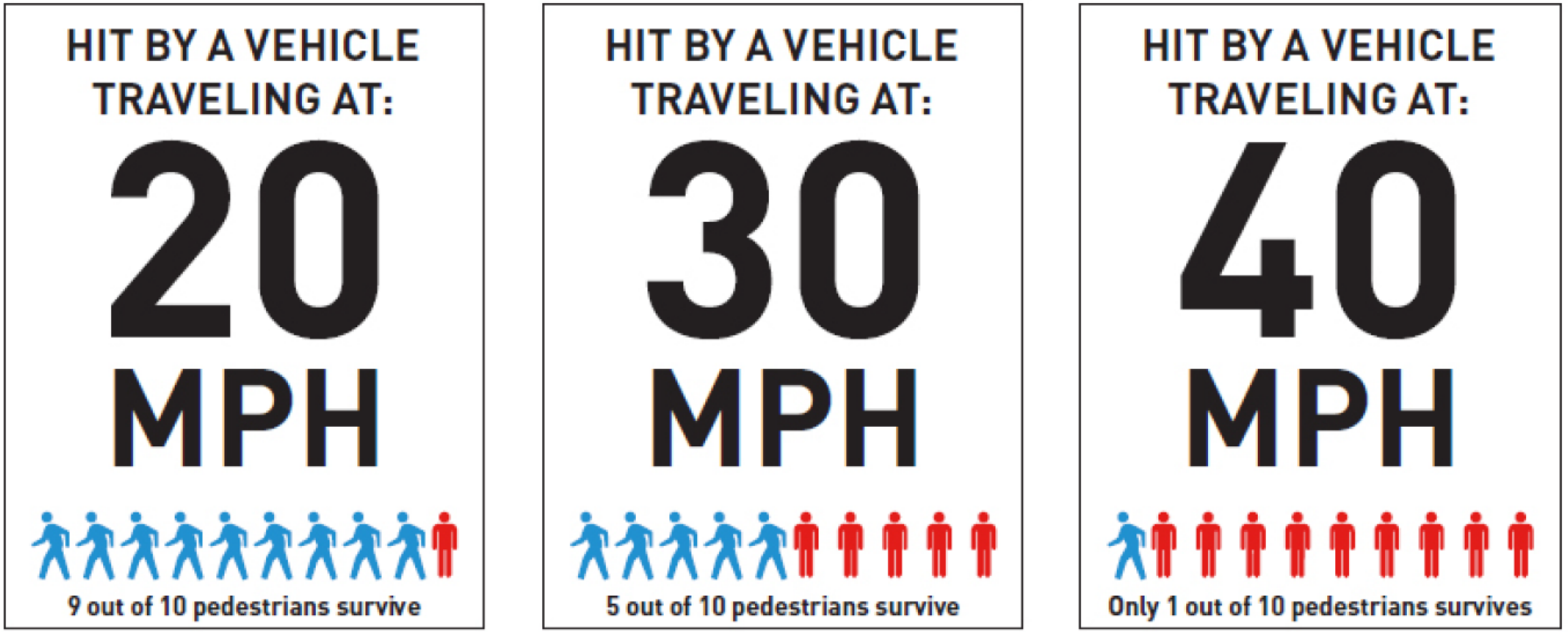


Figure 9: Chance of pedestrian fatality at various impact speeds (Seattle DOT)

SPEEDING

↑ Severity of Crash

↑ Force of impact

↑ Likelihood of Crash

↑ Distance traveled before braking (PIJR Time)

↑ Braking distance

↓ Gap sizes

↓ Ease of judging gap

How much time is life worth?

Miles per Hour

Miles Traveled	20	25	30	35	40	45	50	55	60	65	70
1/4	45	36	30	26	23	20	18	16	15	14	13
1/2	1.5	1.2	1	51	45	40	36	33	30	28	26
1	3	2.4	2	1.7	1.5	1.3	1.2	1.1	1	55	51
2	6	5	4	3.4	3	2.7	2	2.2	2	1.8	1.7
5	15	12	10	8.6	7.5	6.7	6	5.5	5	4.6	4.3
10	30	24	20	17.1	15	13.3	12	10.9	10	9.2	8.6
20	1	48	40	34.3	30	26.7	24	21.8	20	18.5	17.1
50	2.5	2	1.7	1.4	1.3	1.1	1	54.5	50	46.2	42.9
100	5	4	3.3	2.9	2.5	2.2	2	1.8	1.7	1.5	1.4
500	25	20	16.7	14.3	12.5	11.1	10	9.1	8.3	7.7	7.1
1000	50	40	33.3	28.6	25.	22.2	20	18.2	16.7	15.4	14.3
3000	150	120	100	85.7	75	66.7	60	54.5	50	46.2	42.9

Time in Seconds

Time in Minutes

Time in Hours

1/3 of trips in Houston are less than 3 miles

How much time is your life worth? The odds of being killed in an accident rise dramatically with speed. Use the chart above to determine how much time you would save when driving at different speeds. If you are making a 10-mile commute to work, and you usually drive there at 50 m.p.h., you would save less than three minutes if you drove at 65 m.p.h. How about a two-mile trip to the grocery store, through your residential neighborhood? If you drive at 25 m.p.h., it will take you five minutes to get there. Speed down the roads at 50, and it will take you two minutes. Is the three minutes you save worth the life of a child?

Think about it.

Traveled	20	25	30	35	40	45
1/4	45	36	30	26	23	20
1/2	1.5	1.2	1	51	45	40
1	3	2.4	2	1.7	1.5	1.3
2	6	5	4	3.4	3	2.7
5	15	12	10	8.6	7.5	6.7
10	30	24	20	17.1	15	13.3

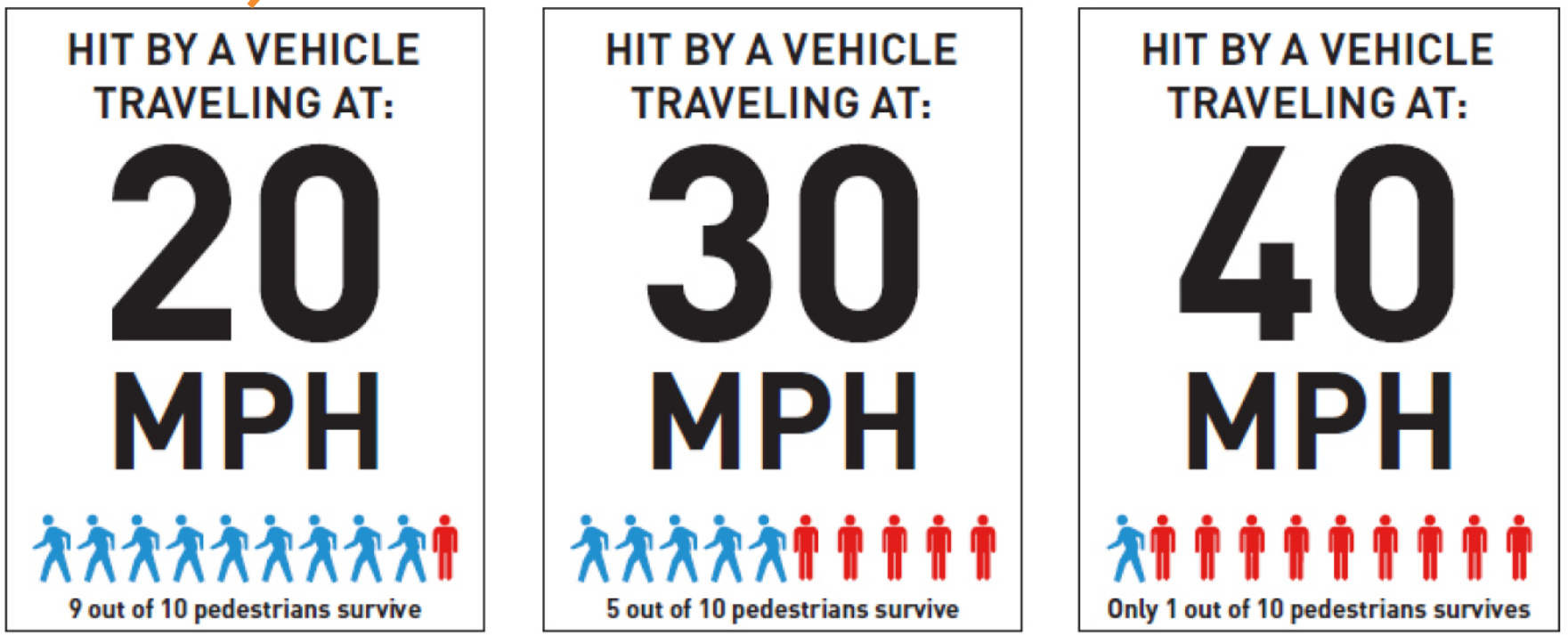


Figure 9: Chance of pedestrian fatality at various impact speeds (Seattle DOT)

WHAT CAN WE DO?

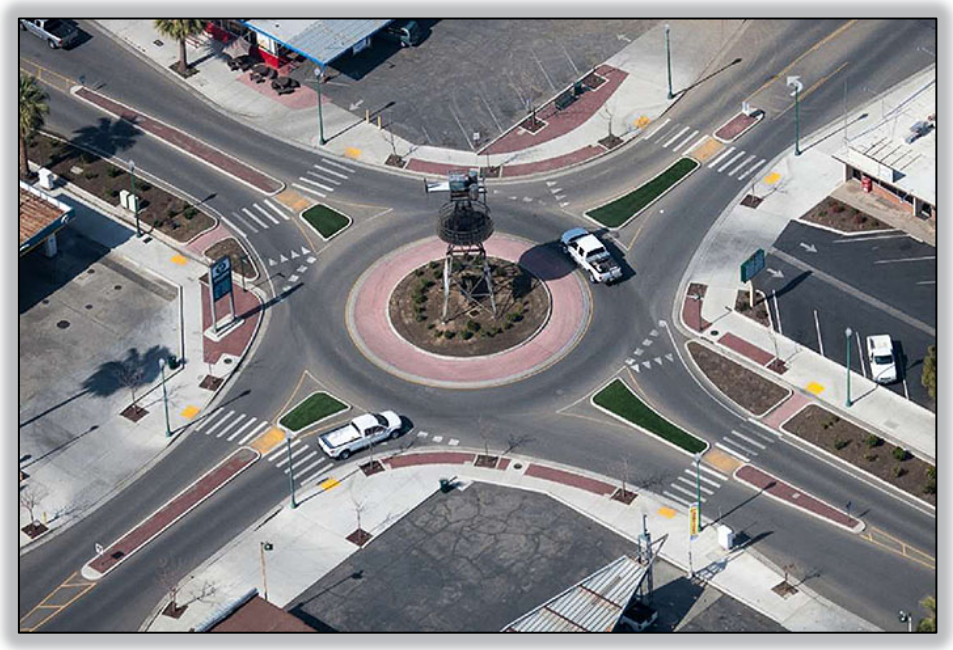
SPEED CAMERAS

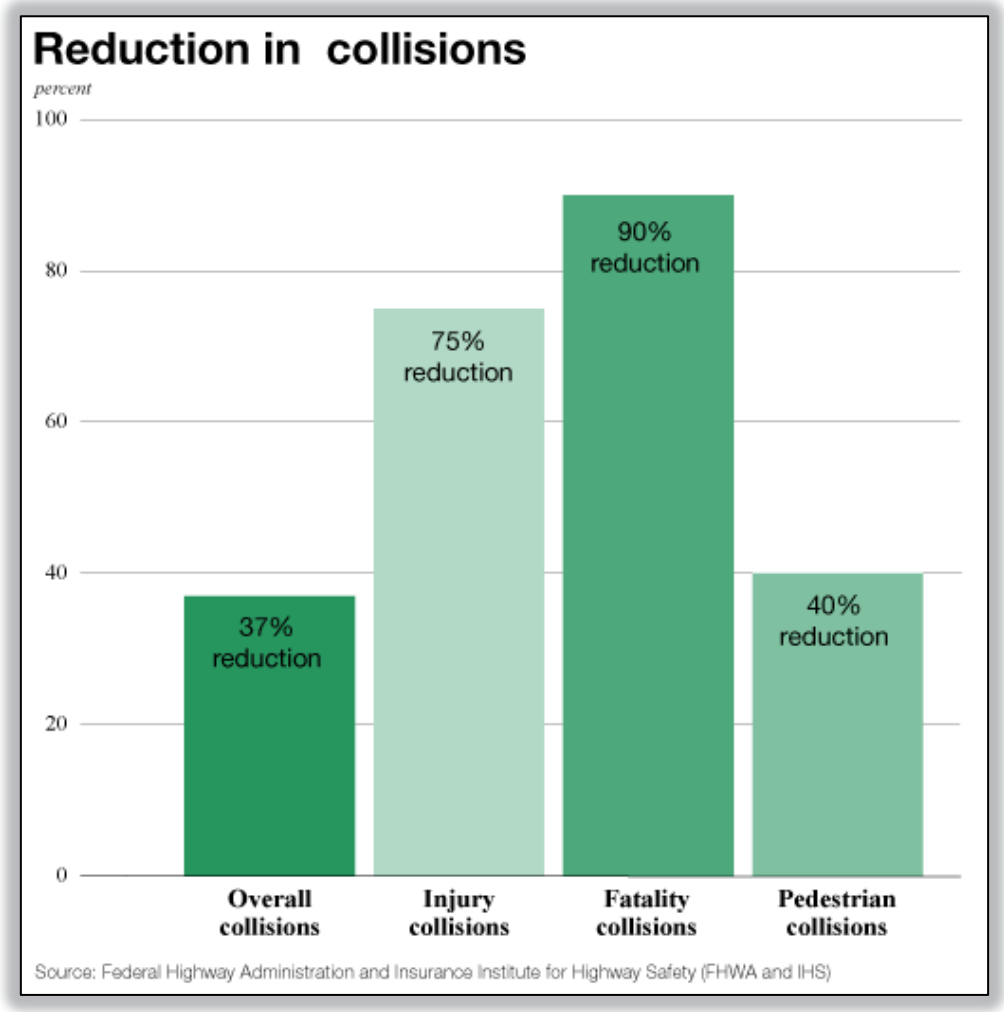
Automated Speed Enforcement Camera Before and After Safety Impact Analysis Summary

Speed Camera Locations / Years	Total Crashes	Fatal and Injury Crashes	Bicycle and Pedestrian Crashes	Speed-Related Crashes	Youth-Related Crashes
2012-2013	6828	1392	463	682	651
2018-2019	6928	1415	388	802	649
% Change	1%	2%	-16%	18%	0%
City-Wide	Total Crashes	Fatal and Injury Crashes	Bicycle and Pedestrian Crashes	Speed-Related Crashes	Youth-Related Crashes
2012-2013	137218	27001	8677	13114	12375
2018-2019	172114	32592	8041	21512	14577
% Change	25%	21%	-7%	64%	18%

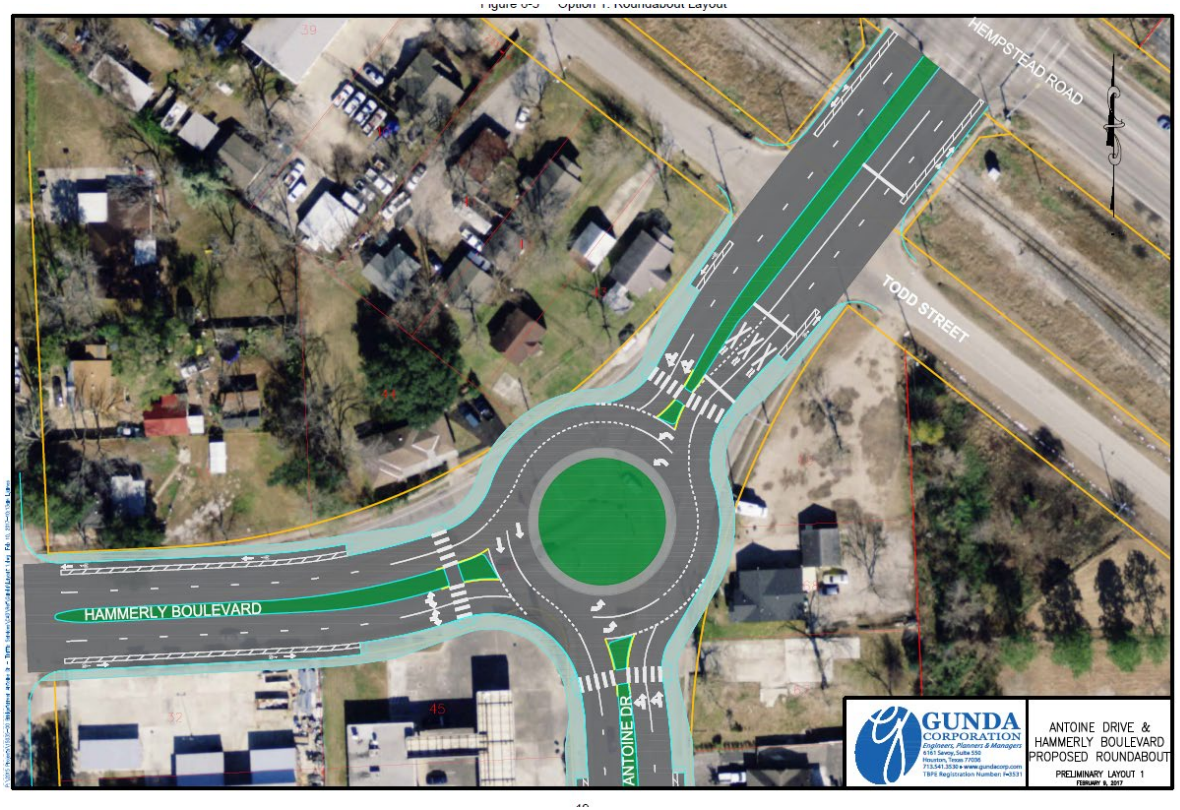
Last year's comparison of crash numbers from 2012-2013 with data from 2017-2018. Chart: CDOT

ROUNDABOUTS

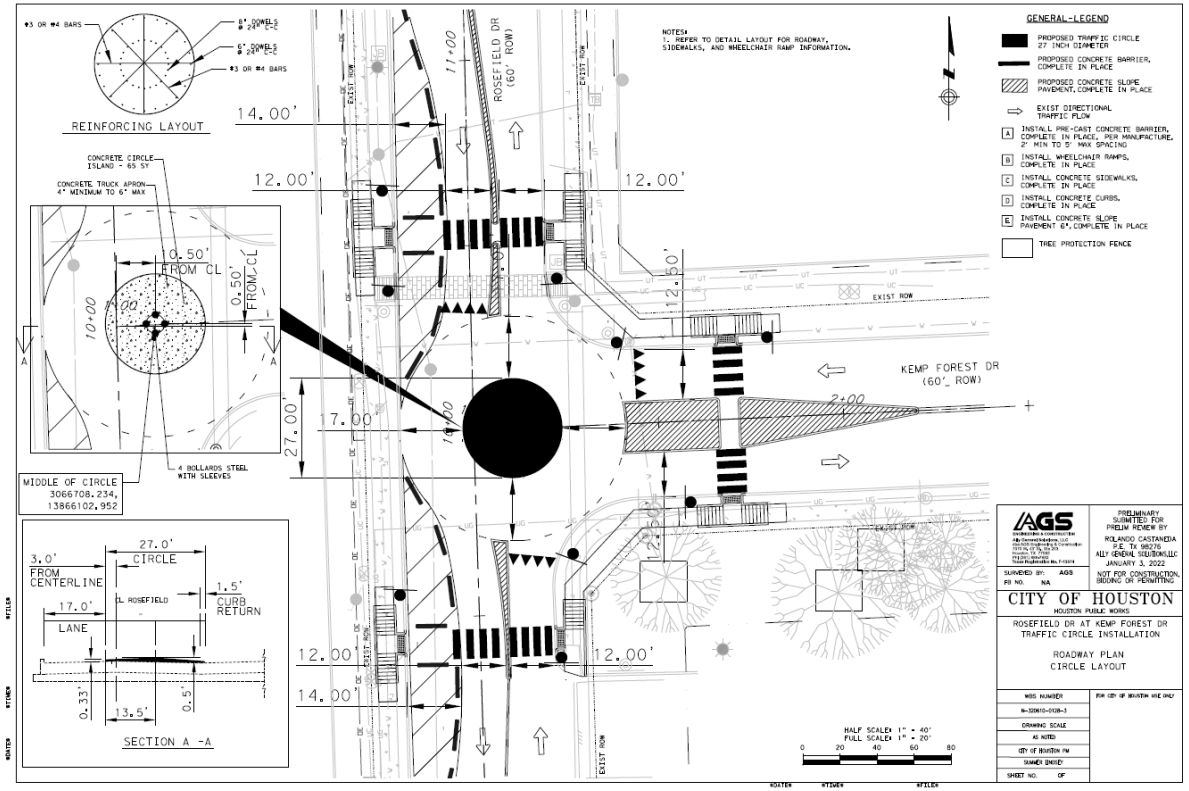




ROUNDABOUTS



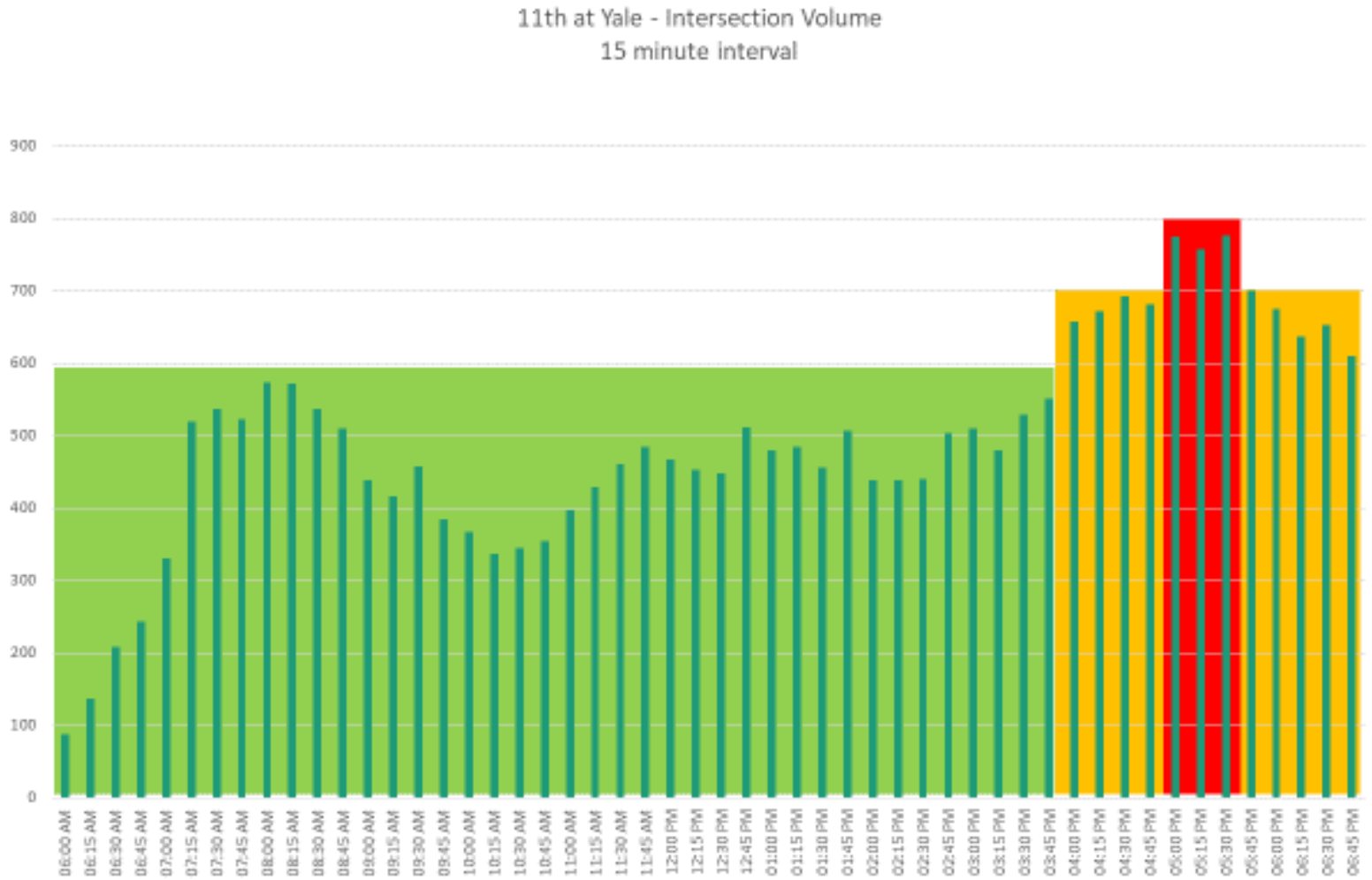
Antoine / Hammerly – Multilane Roundabout



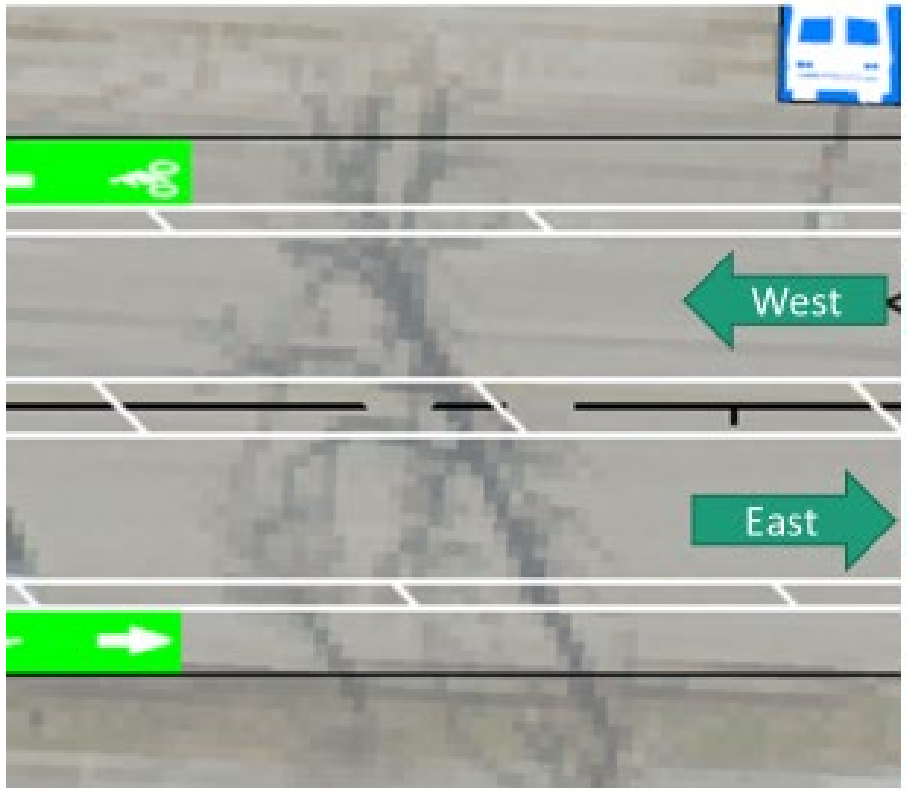
Rosefield / Kempwood – Mini Roundabout
Preliminary estimate: $77,000

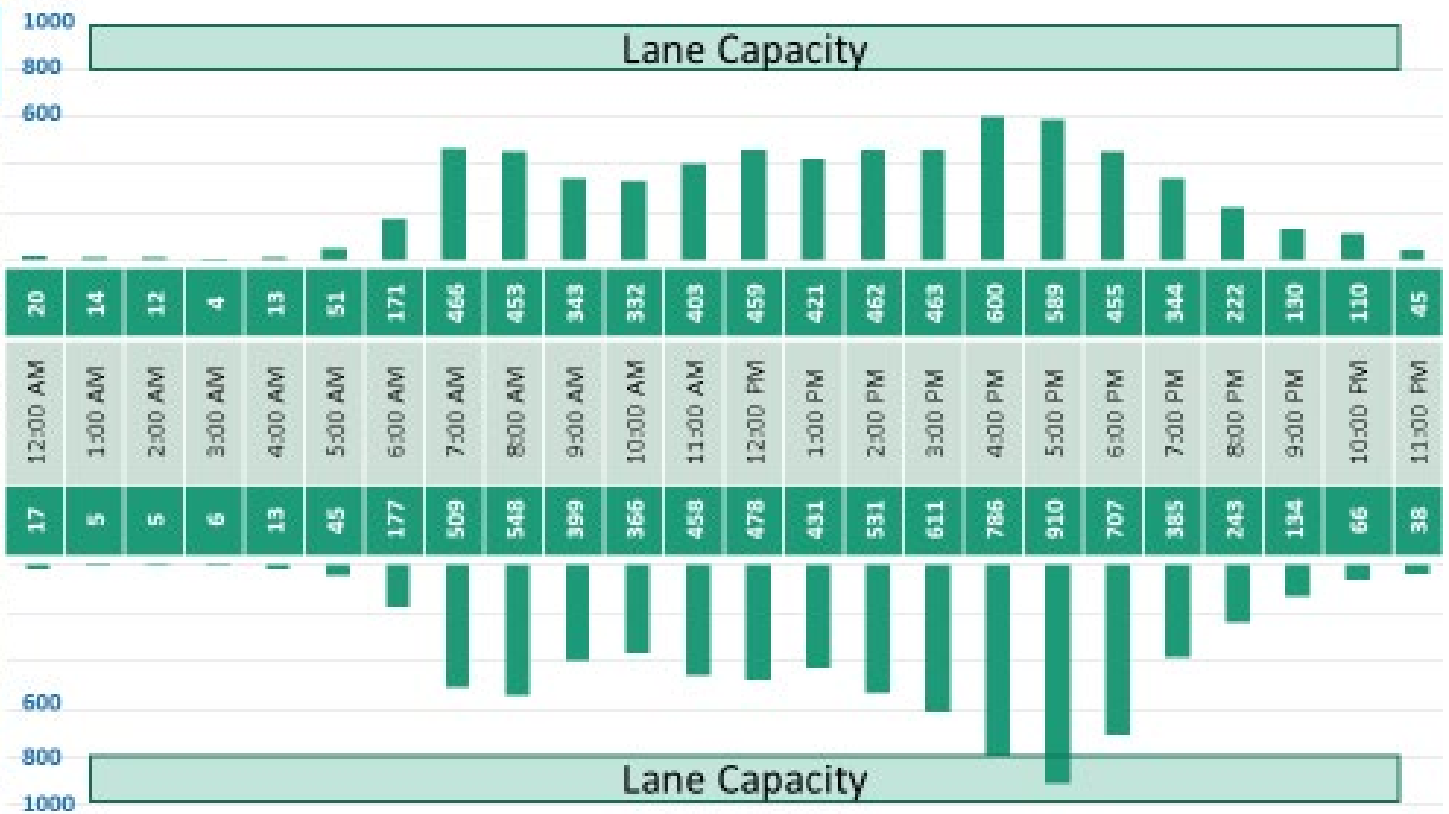
2. PUT PEAK HOUR IN ITS PLACE

PEAK HOUR

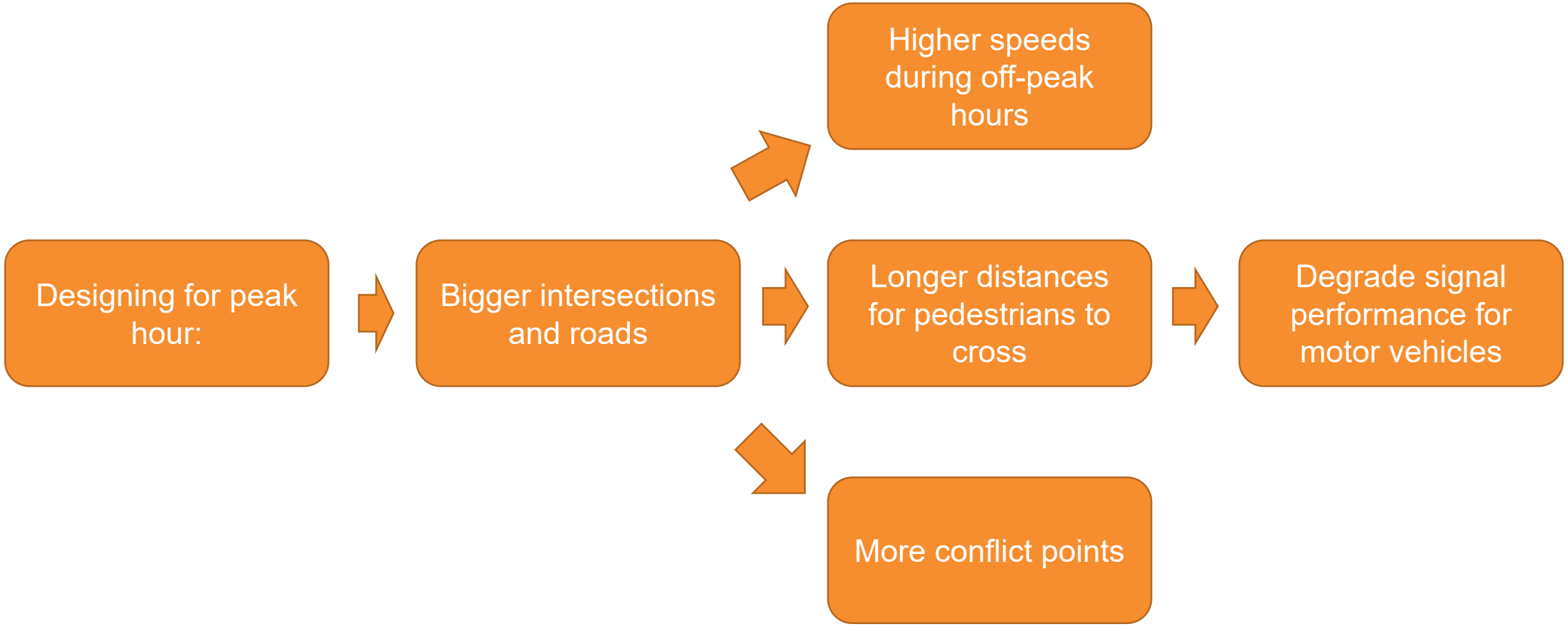

11th at Yale - Intersection Volume
15 minute interval
900
800
700
600
500
400
300
200
100
0
06:00 AM
06:15 AM
06:30 AM
06:45 AM
07:00 AM
07:15 AM
07:30 AM
07:45 AM
08:00 AM
08:15 AM
08:30 AM
08:45 AM
09:00 AM
09:15 AM
09:30 AM
09:45 AM
10:00 AM
10:15 AM
10:30 AM
10:45 AM
11:00 AM
11:15 AM
11:30 AM
11:45 AM
12:00 PM
12:15 PM
12:30 PM
12:45 PM
01:00 PM
01:15 PM
01:30 PM
01:45 PM
02:00 PM
02:15 PM
02:30 PM
02:45 PM
03:00 PM
03:15 PM
03:30 PM
03:45 PM
04:00 PM
04:15 PM
04:30 PM
04:45 PM
05:00 PM
05:15 PM
05:30 PM
05:45 PM
06:00 PM
06:15 PM
06:30 PM
06:45 PM

PUT THE PEAK HOURS IN ITS PLACE





WHY DOES THIS MATTER?



4. DESIGN FOR HUMAN PSYCHOLOGY, NOT AGAINST IT

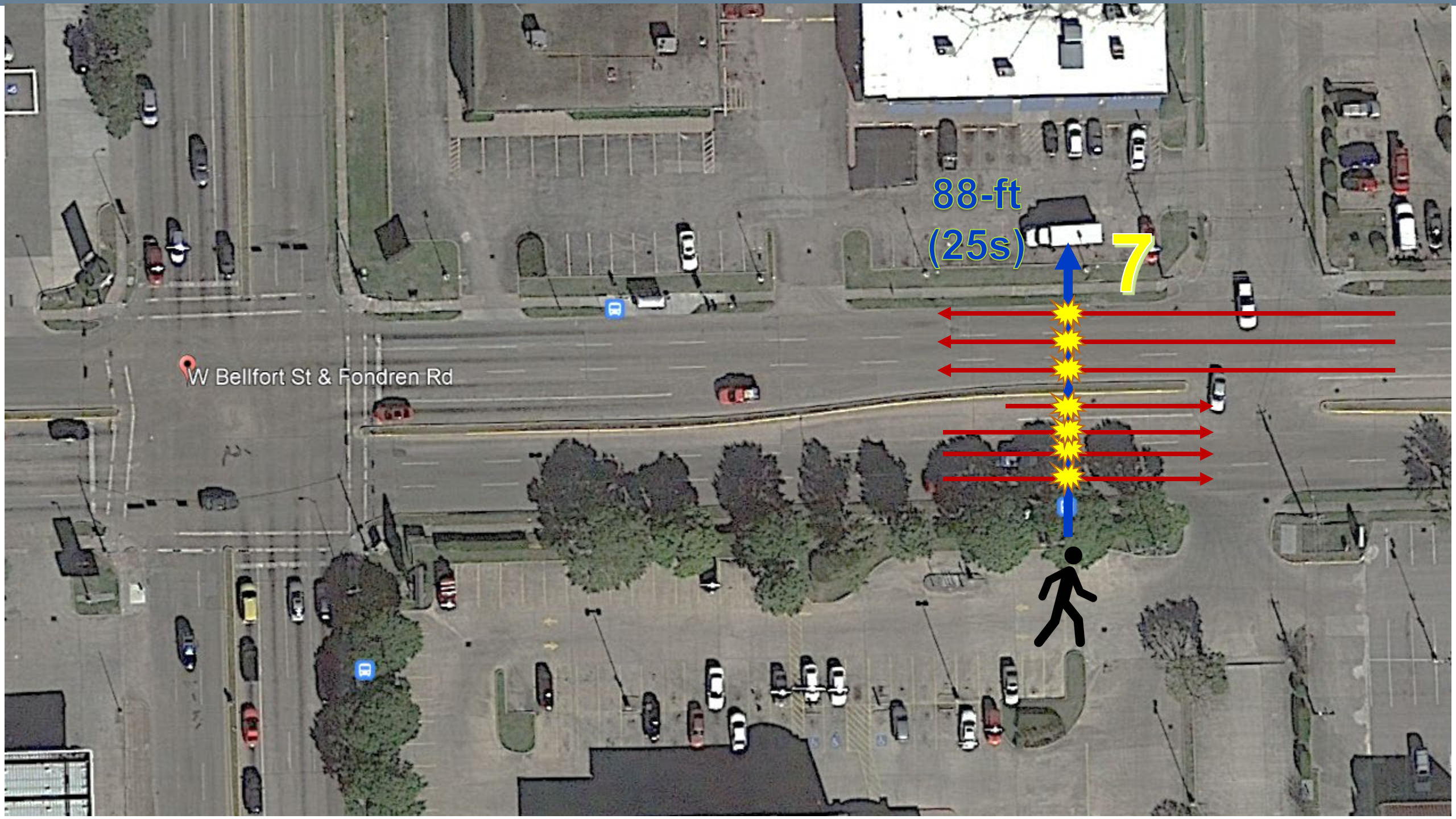
WHERE SHOULD PEDESTRIANS CROSS?

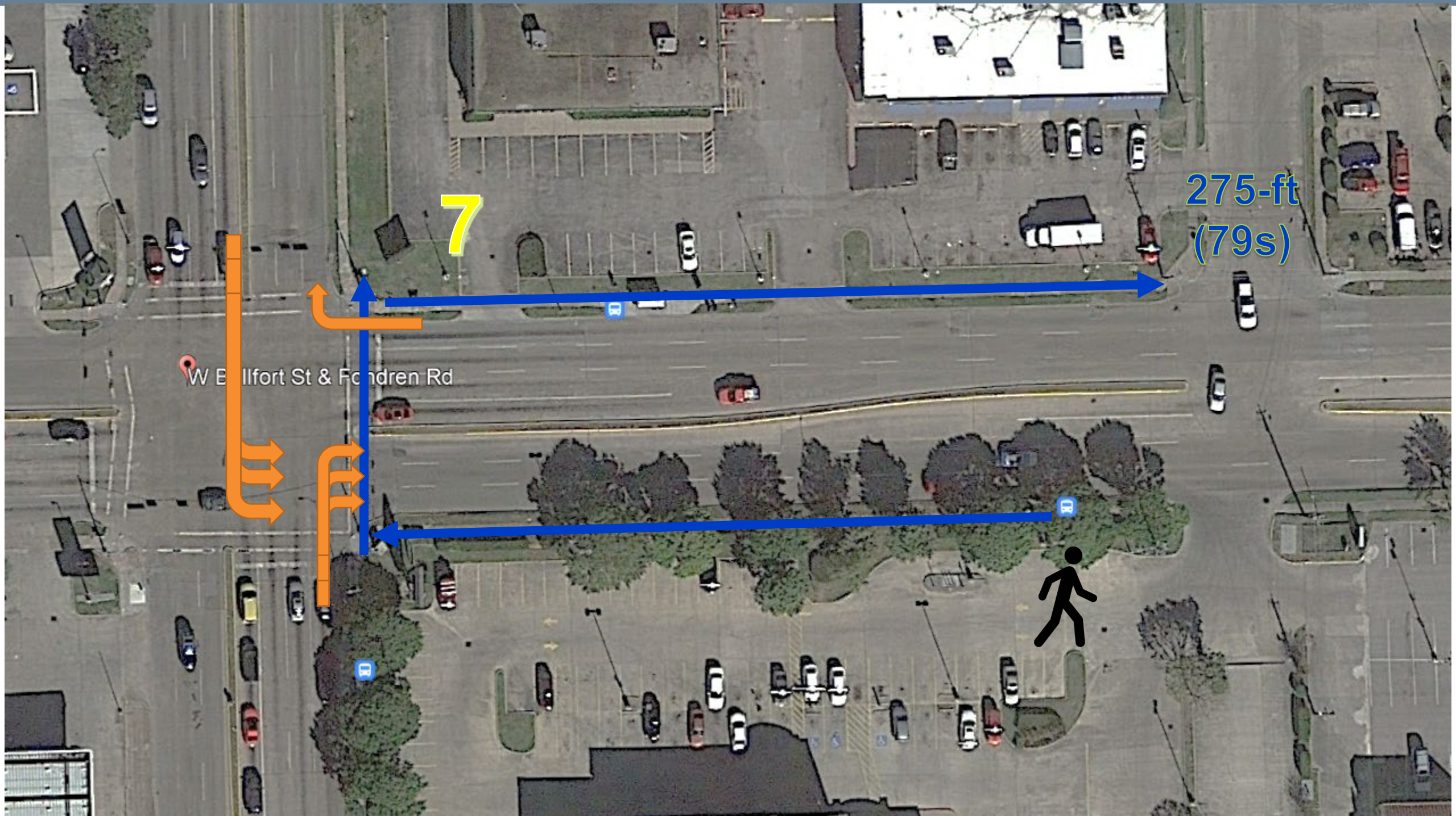
Intersections?

Traditionally, where we want them…

Midblock?

. . .but in reality, they take the fastest route


88-ft
(25s)
7
W Bellfort St & Fondren Rd


7
275-ft
(79s)

PED CROSSING ANALYSIS

Step 1: Identify existing low-delay crossings on corridor

PED CROSSING ANALYSIS

Step 2: Break into 500-ft segments

PED CROSSING ANALYSIS

Step 3: Adjust segments +/- 100-ft

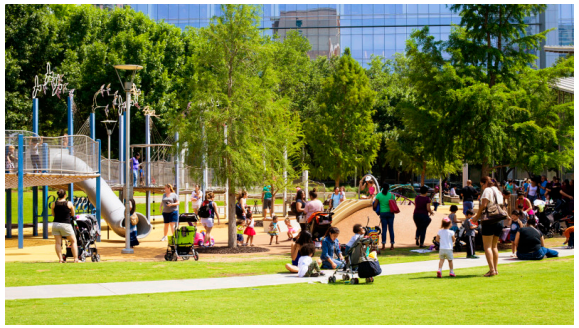
PED CROSSING ANALYSIS

Step 3 cont'd: Serve pedestrian generators

For example. . .

Bus stops

Schools



Parks

PED CROSSING ANALYSIS

Step 4: Determine low-delay treatment

Inputs

Crossing 1: Westheimer EB & WB

Evaluation Inputs:

L = crosswalk length

S_p=average pedestrian walking speed

t_s = pedestrian start-up and end clearance time

V = peak hour vehicles

Number of through lanes crossed

Units:
ft
ft/s
s
veh/hr

Defaults:	
S_p=	3.5
t_s=	3

Input Table:	
L=	44
S_p=	3.5
t_s=	3
V=	1,414
N=	4

Yield Rates

Common motorist yield rates:

Unmarked crosswalk = 0%

High visibility signs and markings (35mph) = 20%

High visibility signs and markings (25mph) = 91%

Overhead flashing beacon (push button activated) = 49%

Overhead flashing beacon (passive activation) = 67%

HCM Ped Delay Equations

one-lane crossing

$$P(Y_i) = P_d M_y (1 - M_y)^{i-1}$$

two-lane crossing

$$P(Y_i) = \left[P_d - \sum_{j=0}^{i-1} P(Y_j) \right] \left[\frac{(2P_b(1-P_b)M_y) + (P_b^2 M_y^2)}{P_d} \right]$$

HCM Ped LOS

LOS	Control delay (s/ped)		Comments
	min.	max.	
A	0	5	Usually no conflicting traffic
B	5	10	Occasionally some delay due to conflicting traffic
C	10	20	Delay noticeable to pedestrians, but not inconveniencing
D	20	30	Delay noticeable and irritating, increased likelihood of risk taking
E	30	45	Delay approaches tolerance level, risk-taking behavior likely
F	45	-	Delay exceeds tolerance level, high likelihood of pedestrian risk taking

HOUSTON PUBLIC WORKS

PED CROSSING ANALYSIS

Step 4 cont'd: Determine low-delay treatment

Common motorist yield rates:

Unmarked crosswalk = 0%

High visibility signs and markings (35mph) = 20%

High visibility signs and markings (25mph) = 91%

Overhead flashing beacon (push button activated) = 49%

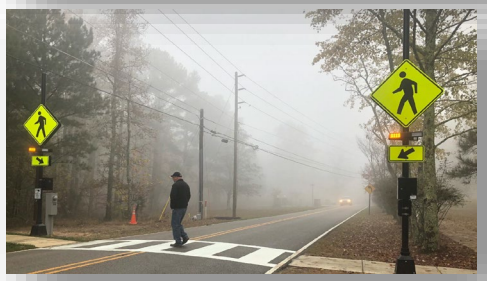
Overhead flashing beacon (passive activation) = 67%

Median refuge = 29%

Midblock signal = 95%

HAWK = 99%

RRFB = 70%*



Goal: LOS D or better

PED CROSSING ANALYSIS

Step 5: Finalize recommendations & prioritize

DETAILS MATTER

SAFETY & VISIBILITY BUFFER

SAFETY & VISIBILITY BUFFER

SAFETY & VISIBILITY BUFFER

Sec. 40-32. - Pedestrian safety and visibility buffer.

(a) It shall be unlawful for any person without an approved application to build, construct, plant, place, or otherwise cause a visual obstruction within the pedestrian safety and visibility buffer adjacent to a driveway where vehicular traffic exits onto a public street and crosses a sidewalk required by article XXII of this chapter.

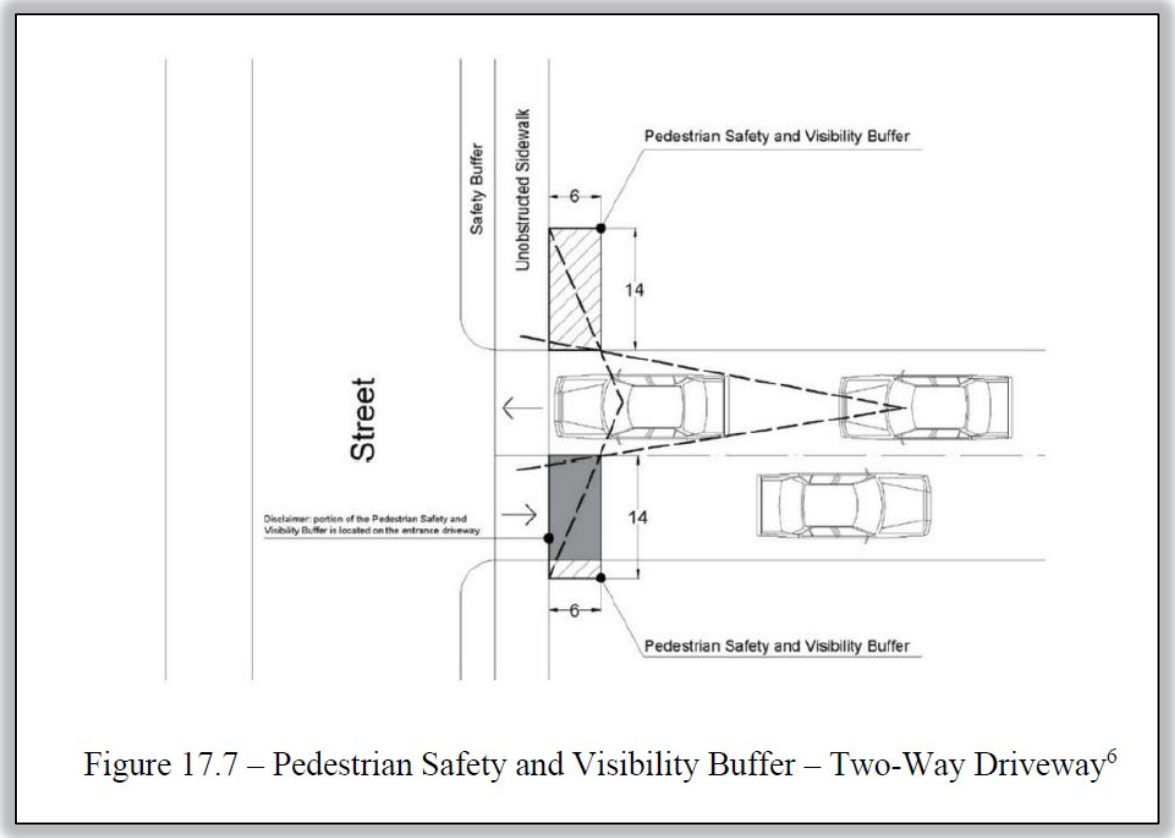


Figure 17.7 – Pedestrian Safety and Visibility Buffer – Two-Way Driveway[6]

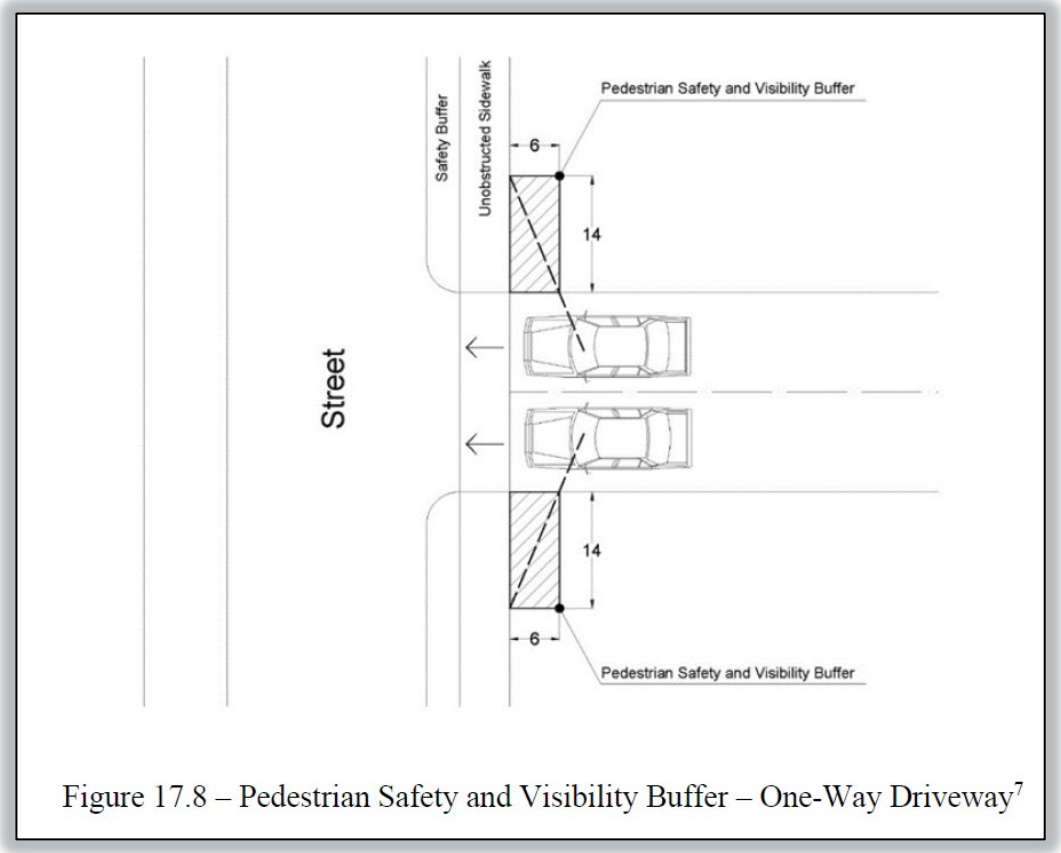
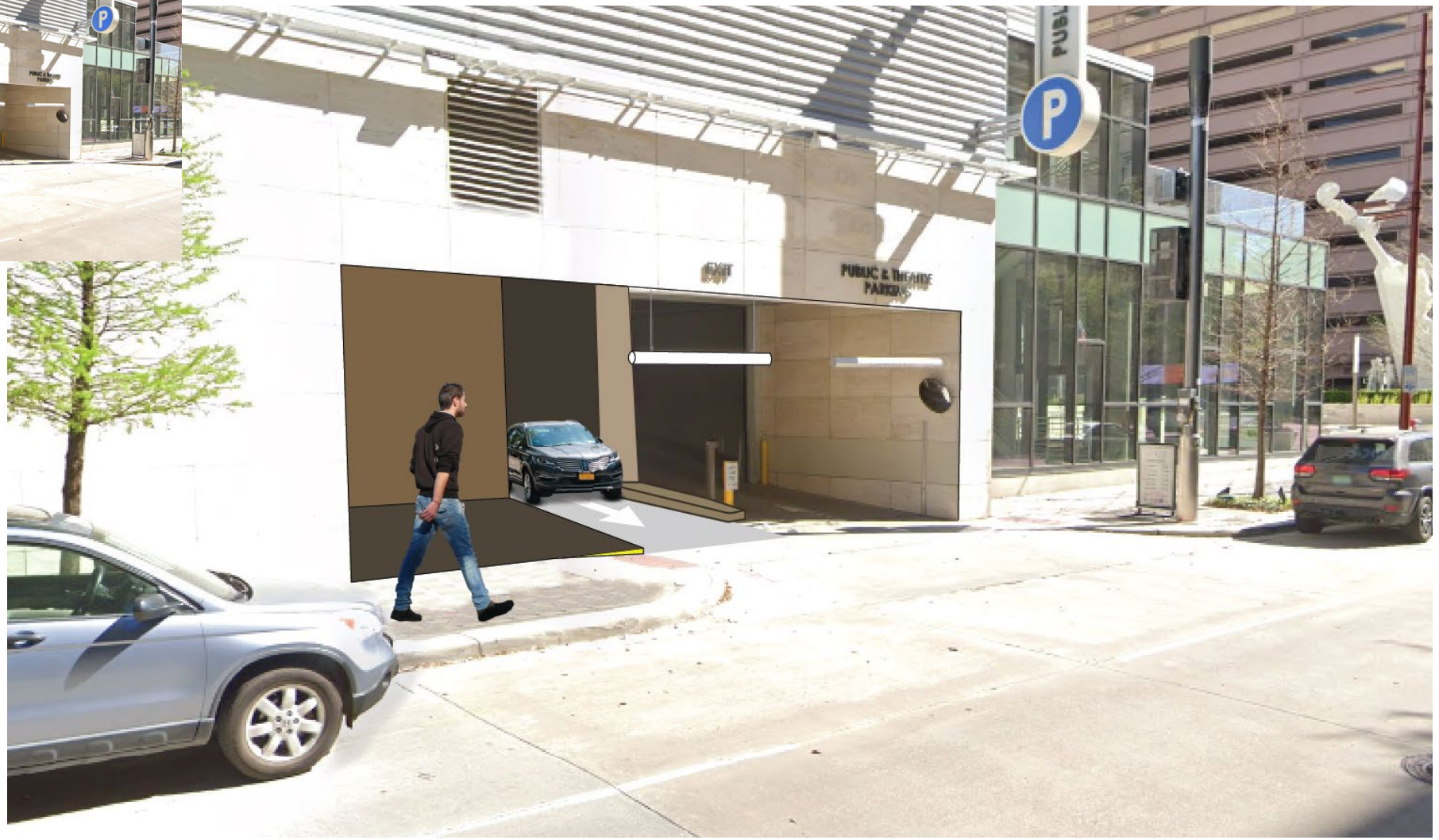


Figure 17.8 – Pedestrian Safety and Visibility Buffer – One-Way Driveway[7]

SAFETY & VISIBILITY BUFFER



WHAT COMES NEXT?

2022-2023

IDM Updates

Ch 15: Traffic

Ch 17: Ped/Bike/Transit

Formal comment period: Aug 22 – Sept 22

Until then, send comments to: **safestreets@houstontx.gov**

thank you!

The True MVPs of HPW

HOUSTON PUBLIC WORKS

HoustonPublicWorks.org | @HouPublicWorks