

# Data-Driven Safety Training Urban 4-Leg Signalized Intersection Part 2 Desired Data

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#### **Outline**

- 1 U4SG required data
- 2 Landing observed intersection crashes
- 3 Desired/optional data
- **4 Predictive structure**
- 5 Salem MO-32/MO-19 example



#### **Desired Data**

- ped
- bus stops
- alcohol sales establishments
- educational facilities



#### Ped Volumes Cross All Intersection Legs

Estimate vehicle-pedestrian collisions

Estimate pedestrian activity based on surrounding

land-use

	Estimate of PedVol
General Level of	(pedestrians/day)
Pedestrian Activity	4SG Intersections
High	3,200
Medium-High	1,500
Medium	700
Medium-Low	240
Low	50



### Maximum Number of Lanes Crossed by Pedestrians

- Longest crossing path
- Both through and turning lanes
- Refuge or raised/depressed island resets the counting
  - flush or painted island does not reset



Maximum Number of Lanes Crossed by

**Pedestrians** 





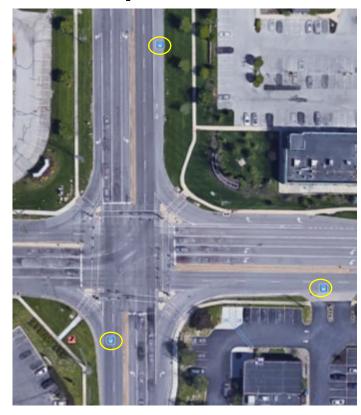
# Number of Bus Stops within 1,000 ft of Intersection

- Sources: transit publications, aerial photos
- Every stop is counted, even at adjacent intersections



Number of Bus Stops within 1,000 ft of

Intersection





### Number of Schools within 1,000 ft of Intersection

- Counted if any portion of the school grounds is within 1,000 ft of the intersection
- Sources: local school registers, aerial photo



# Number of Schools within 1,000 ft of Intersection





# Number of Alcohol Sales Establishments within 1,000 ft of Intersection

- Counted if any part of alcohol establishment is within 1000 ft
- Examples: liquor store, bar, restaurant, convenience store
  - verify if serving alcohol
- Sources: local business registers, aerial photo



# Number of Alcohol Sales Establishments within 1,000 ft of Intersection





### **Default HSM Values**

Crash Modification Factor	Base Condition
Intersection Left-Turn Lanes	Not Present
Intersection Left-Turn Signal Phasing	Permissive Left-
	Turn Phasing
Intersection Right-Turn Lanes	Not Present
Right Turn on Red	Permitting
Lighting	Not Present
Red-Light Cameras	Not Present
Bus Stops within 1,000 ft of the Intersection	Not Present
School within 1,000 ft of the Intersection	Not Present
Alcohol Sales Establishments within 1,000 ft of the Intersection	Not Present



### Safety Prediction Structure

- $N_{\text{predicted } int} = C_i \times (N_{bi} + N_{pedi} + N_{bikei})$ 
  - combine vehicle (bi), pedestrian (pedi), bike crashes (bikei)
- *C<sub>i</sub>* calibration factor
- $N_{bi} = N_{spfint} x (CMF_{1i} x CMF_{2i} x ... x CMF_{6i})$
- $N_{spfint}$  predicted number of total intersection crashes (excluding ped & bike)



#### **Vehicle Crashes**

- Split into multi vehicle and single vehicle
- $N_{spfint} = N_{bimv} + N_{bisv}$
- multi vehicle
  - $N_{bimv} = exp[a + b \times ln(AADT_{mai}) + c \times ln(AADT_{min})]$
- single vehicle
  - $N_{bisv} = exp[a + b \times ln(AADT_{mai}) + c \times ln(AADT_{min})]$
- Note the coefficients a, b, c are different for mv vs. sv
- AADT<sub>mai</sub> combined major road AADT (both directions)
- AADT<sub>min</sub> combined minorroad AADT (both directions)



#### Ped & Bike

- Ped Crashes
  - $N_{pedi} = N_{pedbase} \times CMF_{1p} \times CMF_{2p} \times CMF_{3p}$
  - N<sub>pedbase</sub> predicted vehicle-pedestrian collisions
- Bike Crashes
  - $N_{bikei} = N_{bi} \times f_{bikei}$
  - f<sub>bikei</sub> bicycle crash adjustment factor