

Intersection Safety Analysis

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Intersection Database

TxDOT project (2015-19)

Contains all variables

Includes pedestrian volumes



Data Collection

Existing Databases

- TxDOT's CRIS
- TxDOT's RHINO
- City Databases

Office Data

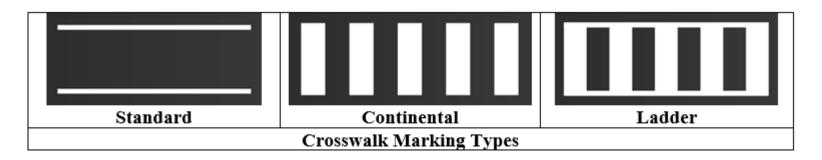
- Aerial Photography
- Street View

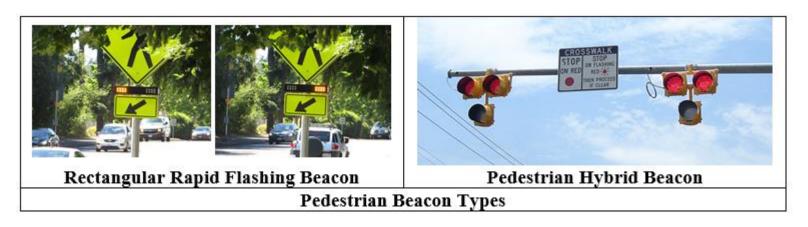
Field Data

- Video Data
- Manual Observation



Field Data Worksheet







Final Data

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Database Size

Houston

- 225 Signalized Intersections
- 33 Midblock locations

San Antonio

- 225 Signalized Intersections
- 31 Midblock locations

DFW

• 100 Signalized Intersections

Austin

• 75 Signalized Intersections

Total

- 625 Signalized Intersections
- 64 Midblock locations



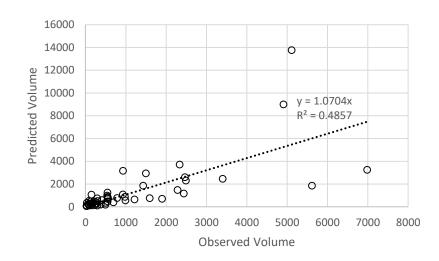
Dallas Pedestrian Safety

- Identified Hot Spots:
 - High Risk intersections (on-system)
- High Risk Intersections
 - Signals (19)
 - Stops (23)
- High Risk Intersection Investigations
 - Reviewed Crash Reports
 - Collision Diagrams in Google Earth
 - Developed potential countermeasures



Negative Binomial Model Pedestrian Volume at Signals

- Increases 4 times if in CBD
- 12% increase per school within 1 mile
- Increases 4.8 times per 1% increase in Commercial/MF residential
- Increases 4.7 times with higher education, hospitals, or malls
- 36% decrease per 5mph increase in max. speed limit

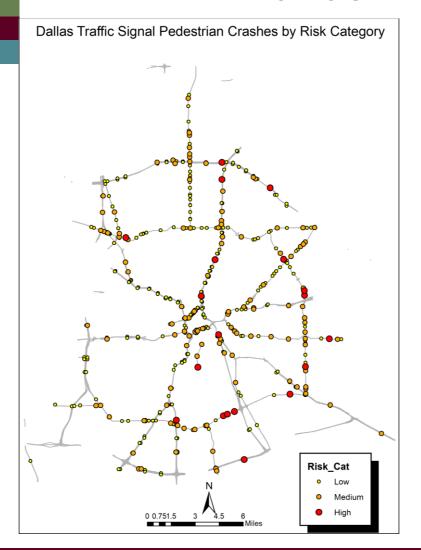


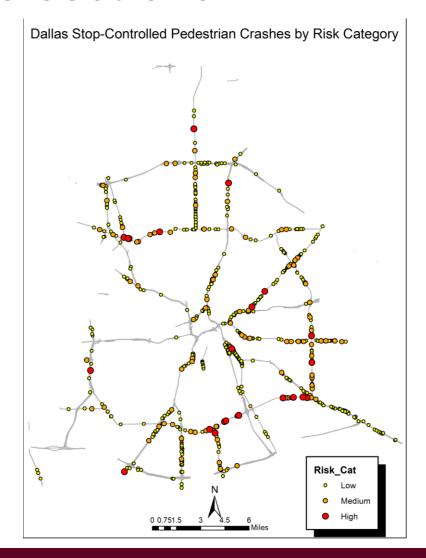
Safety Performance Function

$$N_{ped} = \exp\left[b_0 + b_{tot} AADT_{tot} + b_{ratio} \frac{AADT_{min}}{AADT_{maj}} + b_{ped} PedVol + b_{cmf} p_{comm + MF} + b_{bus} n_{bus}\right]$$

N_{ped}	=	Number of pedestrian crashes
$AADT_{tot}$	=	Sum of major street AADT and minor street AADT.
AADT _{min}	=	Minor street AADT,
$AADT_{maj}$	=	Major street AADT,
PedVol	=	Sum of daily pedestrian volumes (pedestrians/day) crossing all intersection legs,
$p_{comm+MF}$	=	Proportion of commercial and multi-family land use,
n_{bus}	=	Number of bus stops within 300ft of the center of the intersection, and
b_j	=	calibrated coefficients.

Dallas Intersections







LP 12 (NW Hwy), Starlight/Kendale to community

- @ Starlight/Kendale 14 ped. crashes (1 fatal + 4 incapacitated)
- @ Community 12 ped. crashes (5 incapacitated)
- Multiple crashes were "dark, not lighted"; consider roadway lighting
- Two crashes involved drivers running up onto the curb and striking pedestrians who were not in the roadway; consider roadway lighting
- The raised median there appears too narrow for a formal refuge area (5 ft. min.); consider providing refuge area
- Sidewalks are not continuous and might contribute to people crossing at places near (but not at) the intersection; consider installing sidewalks

35 mph zone; consider PHB with advanced markings/signs, Raised Ped Crosswalks





LP 12 (Buckner) @ John West

- 11 ped. crashes
- 4 minor (≤ 16) ped. crashes and 1 wheelchair
- High pedestrian activity node, comm+ MF housing, elementary & middle school
- High ADT and multiple bus stops
- 40 mph on Buckner; 35 mph on John West

Consider Leading Ped. Interval, Ext. Ped Phase, Ped Refuge Island/Raised Median on south leg, Auto Ped Detection



LP 12 (great trinity) @ jim miller

- 12 ped. crashes
- 2 fatal and 3 incapacitated ped. crashes
- Multiple crashes were "dark, not lighted" and away from intersection
- SF housing
- Sidewalks are not continuous
- 50mph on LP 12 but has a 20mph school zone without proper transition

Consider Improve Lighting (away from intersection), provide speed transition, sidewalks



Corinth @ Morrell Ave.

- 8 ped. crashes (3 incapacitated)
- 3 minor (≤ 16) ped. crashes
- Multiple crashes were "dark, not lighted"
- Faded crosswalks (especially west leg)
- Multiple bus stops
- 35mph on Corinth but changes to 40mph at ped. crossing warning beacon on south leg

Consider Improve Lighting on west leg, High-Viz Ped Crosswalks, Ped Countdown Timer





Current work

- SPF for intersection and pedestrian crashes
 - Indicator for city
- Transferability of Pedestrian volume model to other city
- An interactive map where the users can access and visualize the data





THANK YOU

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