Dangerous Crossings: The Relationship Between Intersections and Crashes in Houston

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1. Executive Summary

Traffic accidents involving pedestrians and bicyclists have increased both in Houston and nationally in recent years. Coverage of this situation relies mainly on statistics that list the number and possibly the location of crashes. However, this information alone is not enough to help policymakers address this deadly problem. This report identifies how the attributes of intersections in Houston correlate with higher crash risks.

This report uses a technique called colocation, which identifies spatial patterns — such as the physical distance between two objects or events — in order to analyze the impacts of the built environment on collisions between bicycles or pedestrians and automobiles in Houston.

The colocation analysis identifies both the physical characteristics that make an intersection likely to attract future collisions and specific intersections that require attention in Houston. The analysis does not provide a prediction of the number of incidents that will occur at a given intersection; instead it identifies intersections that will likely attract incidents in the future. This work should help policymakers and engineers identify troublesome areas and improve street design to promote greater safety for all users.

Background

As cities continue to grow and increase in density, walking and bicycling will likely become more popular. Existing automobile-centric road design in Houston and other cities leaves pedestrians and cyclists vulnerable. In Houston, for example, there was a 42 percent increase in intersection-related collisions between 2012 and 2015. This disturbing increase, along with other factors such as a desire to encourage active transportation modes such as walking and biking, has led concerned citizens and Houston-area officials to pursue actions to make existing streets safer. The city of Houston passed a comprehensive bike plan in 2017. It has a Complete Streets and Transportation Plan executive order and advocates have pushed for the adoption of a Vision Zero Plan.

Methodology

Colocation analysis is novel in assessing traffic crashes, but it is often used to identify physical relationships between objects in other fields such as business (e.g., the patterns of CVS and Walgreens located near one another) or crime studies (e.g., burglaries clustered around bars). In this report, two colocation measures are used to analyze the spatial associations between pedestrian- or bicyclist-automobile crashes and intersections.

First a “global” colocation measure is used to take a high-level look at the overall physical relationship between recorded crashes and intersection types. Then, a “local” colocation analysis zooms in to examine the relationship between specific intersections and crashes.

Put simply, the global analysis indicates what types of intersections are more likely to attract what categories of crash incidents. With this information, we can begin to identify particular types of potentially problematic intersections (e.g., traffic light-controlled intersections). The local analysis then identifies specific locations of those types of intersections (e.g., Rusk Street and Louisiana Street) that are likely to attract accidents in the future.

Findings

Overall, this analysis found that traffic light intersections are the most likely intersections in Houston to attract future crash incidents, especially fatalities. This suggests, counterintuitively, that the intersections perceived to be the most controlled are, in fact, those that present the greatest risk. These risks are especially high at complicated and heavily trafficked intersections such as Rusk Street and Louisiana Street downtown and at Main Street and Sunset Drive. On the whole, engineers and policymakers should work to reduce the risk at traffic light intersections by continuing to improve safety for all users and encouraging lower speeds through traffic enforcement.

Nonsignalized intersections on major roadways are also problematic. Wide roadways such as Bellaire Boulevard, Westheimer Road and Richmond Avenue have signalized intersections that are far apart. This reality contributes to crash incidents at uncontrolled intersections when pedestrians jaywalk in the middle of wide streets. This suggests that more signalized, pedestrian crosswalks at shorter intervals may be needed on some streets.

In addition to the presence or absence of traffic signals, intersection structure and proximity to bus/rail stops also matter. Complicated intersections with four or more arms and those that have bus/rail stops nearby are more likely to attract incidents. Actions that simplify traffic flow at complicated intersections and considerations of how to design transit stops in safer ways — such as midblock boarding bulbs — could be considered.

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1Andrew Kragie, "Pedestrian deaths spike in Houston, spurring calls for better urban planning," Houston Chronicle, Nov. 4, 2016
Introduction

Active transportation modes such as walking and bicycling are crucial to efforts to build sustainable urban transportation systems. Many cities, including Houston, are grappling with how to reduce vehicular traffic, energy consumption and the greenhouse gas emissions that come with car travel. Beyond their clear environmental benefits, the large-scale embrace of active modes of travel could lead to significant gains in public health.\(^3\)

The pursuit of this type of city and transportation network is challenged, though, by the continued automobile-centric street design of most U.S. cities. This approach prioritizes car traffic and leaves pedestrians and bicyclists vulnerable.

The dangers of the public street for pedestrians and bicyclists have become increasingly apparent over the past several years. According to the National Highway Traffic Safety Administration, an average of 4,500 pedestrians were killed and 66,000 injured in automobile-related crashes each year between 2004 and 2013. Nationally, pedestrians are involved in 14 percent of all fatality crashes, despite the fact that walking remains a minimal part of the overall share of trips taken.\(^3\) The percentage of cyclist fatalities increased from 1.5 percent in 2003 to 2.2 percent in 2012. In Houston, according to the Texas Department of Transportation, the percentage of pedestrian-involved crashes increased by 88 percent between 2010 and 2015, and the percentage of bicyclist-involved crashes increased by 42 percent during the same period.

The majority of pedestrian/bicyclist crash injuries and fatalities occurred in cities, where activity is concentrated and where bicycling and walking rates are at their highest.\(^4\) Moreover, cities tend to have large populations of residents who are both likely to walk and who are more vulnerable on the streets — specifically the elderly and the young. And these populations are on the rise. If little attention is paid to the vulnerability of pedestrians and bicyclists during the street design process, these users will likely continue to suffer from high crash risks.

The analysis of typical crash statistics rarely analyzes the spatial patterns of crash incidents. Some studies employ density analysis to look for crash-clustering patterns and identify the most dangerous locations based on past crash incidents. But these approaches do not clarify why crash incidents cluster at specific locations. As a result of this limitation, most of the policy and engineering solutions aimed at creating safer streets are being implemented without a complete picture.

This limitation is being addressed by researchers and practitioners who are increasingly focusing on the ways elements of the built environment — such as land use types, number of traffic lanes, and public transit stop density — are connected to crash incidents.\(^3\)

This report, on the other hand, turns to an even more detailed look at the urban intersections. Here, the traffic patterns are more complex and pedestrians and cyclists are more exposed to vehicular traffic. Using two colocation techniques, we conceptualize where accidents happen and where they may happen based on the types of intersections.

Colocation

Two colocation measures, global and local, are used to analyze the spatial relationship between pedestrian- and bicyclist-automobile crashes and intersections.

Global colocation

The global measure considers the overall relationship between any two types of objects or events — in this case some form of recorded crash and some iteration of an intersection. To search for a pattern, the analysis starts with the observed number of times that a specific intersection type, say a traffic light-controlled intersection, has a specific crash type, say a fatality, in close proximity to it. That number is then compared with those expected to occur by chance through multiple simulation runs. If the resulted metric is greater than one, it indicates a colocation pattern (i.e., fatalities are attracted to traffic light-controlled intersections). If the result is less than one, it denotes an isolation pattern (i.e., fatalities are separated from traffic light-controlled intersections).

Local colocation

The global analysis looks at the general pattern across the entire city but cannot reveal the pattern at specific locations. This is where the local colocation method can step in. It examines the localized pattern between specific points of one variable and the overall set of points from the other. Using the same fatality and traffic light-controlled intersection examples as above, the local analysis shows how a specific traffic light-controlled intersection either attracts or is isolated from all fatality incidents nearby. This approach identifies the locations of those crashes that were spatially tied to certain types of intersections.

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3. Dangerous Crossings: The Relationship Between Intersections and Crashes in Houston
These analyses initially only suggest a “possible” pattern between two objects. Then a Monte Carlo simulation, a computerized mathematical technique that relies on repeated random sampling to obtain the distribution of an unknown probabilistic event, generates a series of “sample” results and compares those with the detected patterns to achieve a confidence level with the colocation findings.

**Scope of the Study**

This study was conducted completely within the city of Houston. Traffic crash records were collected from the Texas Department of Transportation for a six-year period between January 2010 and September 2016. These records include the latitude/longitude of the crash, the time, the injury severity (e.g., fatality, injury and no injury), the actors involved (e.g., driver, passenger, bicyclist and pedestrian), and whether the incident occurred near an intersection. Over this time period, there were 3,952 intersection-related pedestrian- or bicyclist-automobile crashes in Houston. Of those incidents, 90 resulted in a fatality, 1,802 resulted in an injury, and 2,060 were no-injury crashes. Figure 1 displays the locations of these incidents within the city. Those accidents that appear to be outliers are within the city limits along strip annexations.

There are some built-in limitations to this study that should be acknowledged. First, not every element of an intersection was examined independently. We did not investigate the relationship between road width, number of lanes, or the presence of a crosswalk. Such analysis could be repeated when and if that data becomes easily available, however. Second, this research only targeted intersections, not road segments, so it does not fully account for all crashes. Finally, there is not consistent data such as city boundary, road network, locations of traffic lights, stop signs, and bus/rail stops for each year between 2010 and 2016 and thus there may be some inconsistencies over time.

![Figure 1. Three types of pedestrian- or bicyclist-automobile crashes in the city of Houston](image-url)
There are 78,372 intersections in the city of Houston. Of these, 2,286 are traffic light-controlled intersections, 18,882 are stop sign-controlled intersections, and 57,204 are noncontrolled intersections. Figure 2 displays the location of these intersections.

The Metropolitan Transit Authority of Harris County (METRO) operates 9,004 bus stops on 83 bus routes and 44 rail stations across three rail lines. In addition to intersection control type, all intersections are grouped into two categories based on the presence or absence of a bus/rail stop within 400 feet.

Findings

1. Global pattern

The overall relationship between pedestrian- or bicyclist-automobile collisions and intersections is captured by the global measure. This analysis compares the three types of crash incidents and the three different types of intersections.

Our analysis found that pedestrian- or bicyclist-automobile crashes are far more attracted to traffic light intersections than to either stop sign-controlled intersections or noncontrolled intersections (see Appendix 1, Page 13, for full statistical results). The most significant pattern was between traffic light intersections and fatality crashes. The results suggest, perhaps counterintuitively, that our most controlled intersections are those that are likely to attract the most pedestrian- or bicyclist-automobile crashes. Given the location of traffic signals in heavily traveled areas with

![Figure 2. Three types of intersections in the city of Houston](image-url)
often-complicated traffic patterns, this relationship makes sense. It also suggests that greater attention be paid to addressing the challenge of making these intersections safer.

In that vein, it is also worth highlighting that noncontrolled intersections had no significant relationship with any of the crash categories on the global level. The pattern is likewise understandable because nonsignalized intersections are often located in neighborhoods where vehicle speeds are lower. This suggests, perhaps, that slowing speeds around intersections may help reduce the high crash risks for pedestrians and cyclists at signalized intersections.

Patterns between crashes and intersections based on either the number of arms (the number of streets that meet at an intersection) or the presence of a bus/rail stop also proved to be important. The more complicated the intersection, with four or more arms, the more likely it is to attract incidents than more simple designs. The presence of bus/rail stops in intersections is another factor that may lead to high crash risks, as crash incidents were significantly drawn toward these areas. Bus/rail stops draw pedestrians and are likely to increase the number of vulnerable actors in and around an intersection.

2. Local pattern

The global measure helps identify the general patterns across the city. The local measure goes a step further by examining patterns at specific locations and therefore can help highlight issues at particular places.

2.1 Traffic light-controlled intersections

The local colocation analysis identified two fatality incidents (marked by orange dots in Figure 3) with an extremely high degree of attraction to their nearby traffic light intersections of Rusk Street and Louisiana Street, and Rusk Street and Travis Street, in downtown Houston.

Looking at the local colocation pattern between injury incidents and traffic light-controlled intersections, there were 48 injury incidents (marked in blue in Figure 3) significantly attracted to traffic light-controlled intersections. Of these, 45 incidents were concentrated in downtown Houston and the other three were located at the intersections of Hardy Street and Cavalcade Street, Main Street and Sunset Boulevard, and South Rice Avenue and Elm Street.

The analysis between no-injury incidents and traffic light-controlled intersections found 51 no-injury crash locations (in gray in Figure 3) that were significantly affected by traffic light-controlled intersections. Most of these incidents were also clustered in downtown Houston.

Consistent with the global pattern, the local analysis for traffic light-controlled intersections demonstrates that these intersections significantly draw crash incidents across injury severity. However, the local analysis goes a step further by showing how incidents concentrate at certain spots such as downtown Houston. Drilling down from the global to local is essential in cities because of their quickly changing land use patterns and different forms of built environment. While a global measure helps identify patterns across the city,
the local points out differences between a variety of urban spaces and uses.

Figure 3 displays all 101 crashes that were significantly colocated with traffic light intersections together. Clearly, downtown remained the focal point of incidents. The analysis identified just three injury crashes and eight no-injury crashes with high colocation results beyond the immediate downtown area. To more fully examine these crash hotspots and identify possible underlying factors, the 65 traffic light-controlled intersections related to these crash hotspots are drawn out in Figure 4.

Looking closely at the structure of several of these highlighted traffic light intersections can help us identify possible reasons why crash incidents are most likely to occur next to them and to consider new ways to make these intersections safer for all users. These example intersections are highlighted (in blue outline) in Figure 4.

Downtown

As shown in Figure 4, the majority of the 65 traffic light controlled intersections were clustered in downtown Houston, including the two intersections with the greatest likelihood of attracting future fatality incidents (Rusk Street and Louisiana Street and Rusk Street and Travis Street).

What makes the traffic light intersections in downtown Houston more prone to crashes than those in other areas?

Visually examining the intersections (Figures 5 and 6) allows several complicating factors to pop out.

Figure 4. Locations of traffic light controlled intersections that significantly attracted all three types of crashes

Figure 5. Rusk Street and Louisiana Street intersection in downtown

Figure 6. Rusk Street and Travis Street intersection in downtown
• **Mixture of modes**
  • Pedestrians, bicycles, light-rail, buses, and private automobiles all share the same spaces.

• **Heavy traffic**
  • High number of daily commuters. In 2014, there were 154,338 workers who commuted from outside downtown Houston to the area for jobs every day. Specifically, the blocks around the two intersections in Figure 5 and Figure 6 contain 15,122 jobs, roughly 10 percent of all jobs in the downtown area.
  • Numerous activity centers that attract range of users throughout day and night

• **At-grade light rail**
  • Automobiles, pedestrians and bicyclists can all cross its path with few barriers.
  • Mixture and density traffic control signals

• **Pedestrians, automobiles, light-rail all have different signals**

• **Large number of traffic lights in close proximity may distract drivers looking at the wrong intersection**

• **One-way streets**
  • Higher-speed traffic and a more complicated traffic pattern for pedestrians to pay attention to. Those unfamiliar with the setup are more likely to cause incidents

• **Corner bus stops**
  • Attract additional activity to busiest points

• **High levels of construction**
  • Can lead to sidewalk and street closures and additional confusion
  • Often puts pedestrians and bicyclists into more vulnerable positions

Given the noticeable clusters of intersections where future accidents are more likely to occur in downtown Houston, greater attention should be paid to this area.

**Possible interventions:**
• Better coordination of the various types of traffic control signals
• More consistency in construction signage and detouring. This would also require more significant enforcement.
• Enforcement of safer traffic speeds at or around intersections in downtown
• Shifting of bus stops in particular away from intersection corners. Consider midblock boarding bulb-out stops in high-traffic areas.
• Reconsider extensive use of one-way streets.
• Continue to improve caution signage and barriers around at-grade rail.

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*Emily Badger, “Why one-way streets are bad for everyone but speeding cars,” The Washington Post, April 17, 2015.*

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**Main and Sunset**

The intersection at Main Street and Sunset Boulevard (Figure 7), which separates Rice University from Hermann Park, is another location that is dangerous for pedestrians and people on bikes to cross.

![Main Street and Sunset Boulevard intersection in Rice — Hermann Park area](image)

Several factors contribute to its attraction of incidents.

• **Complicated intersection**
  • There are several directions of traffic for automobiles in particular. This makes it a difficult space to navigate for all users.

• **Mixture of modes**
  • There are spaces where automobiles, trains, pedestrians and people on bikes all converge.

• **Numerous traffic-control mechanisms**
  • There are two traffic lights for vehicles within the intersection.
  • The light-rail and pedestrians also have their own signals, similar to downtown.
• **Wide intersection**
  • Pedestrians and people on bikes need to cross an exceptionally long intersection in front of cars, buses and trains. The signals are also timed differently resulting in confusion of which section of road pedestrians should be crossing.

• **At-grade light-rail**
  • Automobiles, pedestrians and bicyclists can all cross its path with few barriers.

This location has also been the site of a number of high-profile incidents, including a recent crash between a light-rail train and a person on a bike that resulted in the death of the cyclist. In response to that incident, METRO and the city of Houston have added a number of attention-grabbing elements to the intersection to alert users to pay additional attention.

**Possible interventions:**
• Consider ways to shorten the intersection for pedestrians such as installing a median island.
• Give pedestrians and bicyclists a longer crossing time or consider giving those users a head start on the light before automobiles are given a green light.
• Investigate new approaches to coordinating signals between Fannin Street and Main Street to remove confusion for pedestrians and bicyclists crossing the two intersections.
• Simplify the directions of travel for vehicles at the intersection.
• Add additional signage and warnings to the intersection around the light-rail in particular. Especially focus on alerting drivers to the dangers of the intersection.

### 2.2 Stop sign/noncontrolled intersections

As for the pattern with stop sign/noncontrolled intersections, the analysis identified 232 crash incidents that were significantly tied to stop sign intersections across all three injury types. It also identified 64 crashes that were significantly attracted to noncontrolled intersections. The degree of attraction between crashes and stop sign and noncontrolled intersections was far less pronounced than that between crashes and traffic light-controlled intersections (see Appendix 1).
In Figures 8 and 9, we map the locations of the stop sign-controlled intersections and noncontrolled intersections that significantly attract pedestrian- or bicyclist-automobile crashes. The stop sign intersections were mostly located in central Houston (within I-610 loop), while the noncontrolled intersections were clustered outside the loop to the west and often along major roadways.

Interestingly, while the global analysis did not identify any overarching relationship between noncontrolled intersections and crashes, the local analysis highlighted 55 noncontrolled intersections where we are more likely to expect crash incidents. This indicates that the higher-level global analysis did not capture the small number of noncontrolled intersections that were tied to crashes, proving the importance of running the two colocation analyses together.

Investigating several case studies of stop sign-controlled and noncontrolled intersections that are significantly associated with crashes can help to identify repeated issues and suggest some possible safety interventions. These selected intersections are highlighted (in red outline) in Figures 8 and 9.

**Figure 9.** Locations of noncontrolled intersections that significantly attracted all three types of crashes
Stop sign-controlled intersections

Westheimer Road and Hullsmith Drive

As shown in Figure 10, this stop sign intersection connects Hullsmith Drive with the busy and wide Westheimer Road.

There are several issues that indicate why the intersection is potentially dangerous.

- **Wide street with high speeds**
  - Westheimer Road is an eight-lane road (four lanes in each direction) at this juncture with a 35 mph speed limit.

- **No signals**
  - The closest traffic light-controlled intersection is 0.3 miles away, a distance greater than most people are likely to walk.

- **Nearby bus stop**
  - There is a bus stop located right next to this intersection and it is the only east-bound stop on the popular 82 bus route. To access it from the north, users must either cross eight lanes of traffic without aid or walk to the traffic light-controlled intersection and then walk back.

West 42nd Street and North Shepherd Drive

The intersection of North Shepherd Drive (six to eight lanes) and West 42nd Street is a four-way intersection with the east-west traffic controlled by stop signs. Shepherd splits a residential area from a commercial strip, and it is highly probable that residents living to the west of North Shepherd Drive walk to the other side to visit businesses such as CVS and Sears.

Possible interventions for stop sign-controlled intersections:

- Install a midblock crosswalk with pedestrian islands.
- Look at possibility of additional traffic lights in strategic locations.
- Consider lowering the speed limit or narrowing wide roads in areas with heavy pedestrian activity. Could consider bulb-out curbs or briefly narrowed roadways at midblock crossings.
- Move bus stops closer to traffic light-controlled intersections (but not at an intersection corner), and consider using additional design approaches for greater safety.
Noncontrolled intersections

Greens Road and Tom Wussow Park

This intersection does not have any lights or signs. Rather than two roads meeting, it is the site of a pedestrian trail crossing Greens Road. The trail connects pedestrians and people on bikes to Tom Wussow Park.

- High speeds
  - Despite being next to a neighborhood and a park, Greens Road has a high speed limit of 35 mph.

- Nontraditional intersection
  - Most drivers and road users are not attentive at such intersections, as they are out of character from typical intersections. Greater care is required around spaces where pedestrians and people on bikes are encouraged to cross.

- No signals or crosswalk
  - There are no lights, signs or other indicators to alert users of either the path or the street of the high-risk intersection.
  - There also is no crosswalk.

Park Row Drive

Another common example of high-risk noncontrolled intersections are intersections of major roads with nonsignaled entrances or exits to businesses, housing developments, or homes. The entrance to a retail strip in the 19000 block of Park Row Drive near the Park Falls apartments is one such example.

- No signals or crosswalk
  - The egress from the community has no stop sign or other traffic control signal. Drivers are expected to yield to crossing traffic, but there is no indication of proper pedestrian spaces or formal regulation of a driver's behavior.
  - Despite being the exit of a housing development, there is no crosswalk to direct pedestrians or signal to alert drivers to the possibility of their presence.

- Wide street and high speed
  - Many noncontrolled intersections are found leading onto relatively high-trafficked streets with higher speed traffic than a typical residential street would have.

Possible interventions for noncontrolled intersections:

- Add additional pedestrian crossing signs and crosswalks to currently unmarked areas. Consider narrowing roadways at crosswalks.
- Install special signage and attention-grabbing practices, such as bright paint or other markers at points of egress for shopping centers and apartments located on busy roads.
- Lower speeds near such intersections with speed tables or other traffic-slowing approaches.

Conclusions

Given the increasing number of crashes and injuries to pedestrian and cyclists, actors across the nation — from cities, to law enforcement agencies, to citizen advocates — are working on ways to improve. The need for this focus will only grow as our cities and suburbs become more dense and walking and biking become more heavily used modes of transportation. Although many studies have targeted this issue by reporting crash statistics, this work is not providing policymakers with enough information to understand where and why collisions happened and may happen. Using colocation at both the global and local level, this analysis provides another method to understand crash incidents and to inform the ways officials make decisions about future street-level safety and design interventions.

Many of the examples cited above are high-risk intersections because of Houston's automobile-centric street design. Too often the primary concern for street design has been vehicle throughput and flow. Historically and today, the needs of pedestrians and people on bikes are afterthoughts when streets are redesigned or built out. The results are intersections that are confusing for all users. Thankfully, through the efforts of many groups, this trend is changing. In Houston, the recently approved Houston Bike
Plan promises to move considerations for people on bikes to a more central part of the design process. Likewise, the city’s Complete Streets and Transportation Plan executive order, while not mandating design features that increase safety and account for all users, compels the Public Works and Engineering Department to consider pedestrian and bicycle needs more than before.

The key finding of this research — that bicycle- and pedestrian-automobile crashes are collectively colocated with signalized intersections — suggests that these intersections require attention to make our streets safer for all. While traffic light intersections are the most controlled in terms of signage, it is clear that they are not the most safe. Both the global and local findings provide useful policy implications for planners and decision-makers. Physical improvements that alert users to proceed with caution around other road users or in complicated intersections — such as pedestrian visibility via crosswalks, traffic lights or protected medians — could make a big impact. Likewise, attempts to induce slower speeds in or near intersections would likely benefit safety. This might mean reducing speed limits as they approach high-risk intersections and adding additional notification and warning features like rumble strips or painting. Finally, attempts to shorten the distance pedestrians and people on bikes have to cross via protected medians or narrower streets would likely reduce risks as well.

This report is not suggesting that every intersection in Houston needs to undergo this transformation. Instead it uses the colocation analysis to identify some high-risk areas that might be used as test-beds.

### Appendix

**Table 1.** Global colocation analysis of pedestrian- or bicyclist-automobile collisions versus intersections

<table>
<thead>
<tr>
<th>Crash type</th>
<th>Signals</th>
<th>Number of Arms</th>
<th>Bus/rail stops</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Controlled</td>
<td>Stop sign</td>
<td>Traffic light</td>
</tr>
<tr>
<td>Fatality</td>
<td>0.5</td>
<td>1.48</td>
<td>9.81</td>
</tr>
<tr>
<td>Injury</td>
<td>0.57</td>
<td>1.49</td>
<td>7.79</td>
</tr>
<tr>
<td>No injury</td>
<td>0.58</td>
<td>1.44</td>
<td>7.90</td>
</tr>
</tbody>
</table>

Any numbers in the above table are statistically significant. The larger the number (when it is larger than 1), the greater the relationship between the intersection type and the crash type.
The mission of the Kinder Institute is to:

• Advance understanding of the most important issues facing Houston and other leading urban centers through rigorous research, policy analysis and public outreach

• Collaborate with civic leaders to implement promising solutions to these critical urban issues