

children's optimal health

Transportation Related Child Injury

Map Group 1

Motor Vehicle Crashes Involving Children

Map Group 2

Child Passenger Safety: Restraint Use and Resources

Map Group 3

Child Pedestrian and Cyclist Injuries

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Project Overview

In 2009, the Injury Prevention Program at Dell Children's Medical Center of Central Texas approached Children's Optimal Health (COH) with a desire to utilize mapping technology to identify areas of concern for child injury. As a Level I Trauma Center, Dell Children's houses a registry of data containing information about injured children, but the program knew more information was needed to truly understand how and where children are injured. Children's Optimal Health, through relationships with the Austin Police Department and other community agencies, was able to meet this need. The maps presented here display child injury indicators from Dell Children's Medical Center and the Austin Police Department.

In the Fall of 2010, a sub-group of these maps was utilized in a collaborative effort to begin further study of areas that ranked among the top 10 for child pedestrian and cyclist injury. The City of Austin Transportation Department and the Injury Prevention Program at Dell Children's provided training to graduate students at the University of Texas at Austin School of Social Work, who then performed observational analyses of the intersections. The students presented their results and recommendations for environmental changes and enforcement strategies to the City of Austin and the Austin Police Department. The data they collected is also currently being analyzed by Dell Children's Medical Center.

Background

In the United States, preventable injury is the leading cause of death for people between the ages of 1 and 44.¹ In 2007, injuries were responsible for 3.7 million years of potential life lost before age 65. The injury burden is especially high in the pediatric population. In 2007, injuries took the lives of 6,534 children aged birth through 14 years in the United States. Injury impacts many more children than it kills, affecting more than 6.3 million children in 2009. Annually, child injuries result in billions of dollars in medical care expenses and thousands of years of productive life lost.

Injury is also the leading cause of death and disability for children in Texas, cutting short the lives of 651 children annually. In Texas in 2007, as many children 1-14 years of age died from unintentional injury causes (n=399) as from the next nine leading causes of death combined (n=400).

¹All data from the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, using the Web-based Injury Statistics Query and Reporting System, 2007 (www.cdc.gov/injury/wisqars).

Transportation-Related Child Injury Maps

The maps presented here are intended to address two of the leading causes of child injury: motor vehicle collisions and pedestrian/cycling injuries. The maps are presented in three groups in order to address three distinct approaches to preventing injury:

- Group 1: Motor Vehicle Crashes Involving Children
- Group 2: Child Passenger Safety: Restraint Use & Resources
- Group 3: Child Pedestrian and Cyclist Injuries

Group 1: Motor Vehicle Crashes Involving Children

Sadly, motor vehicle crashes are the leading cause of injury-related death to children over the age of 1 year.

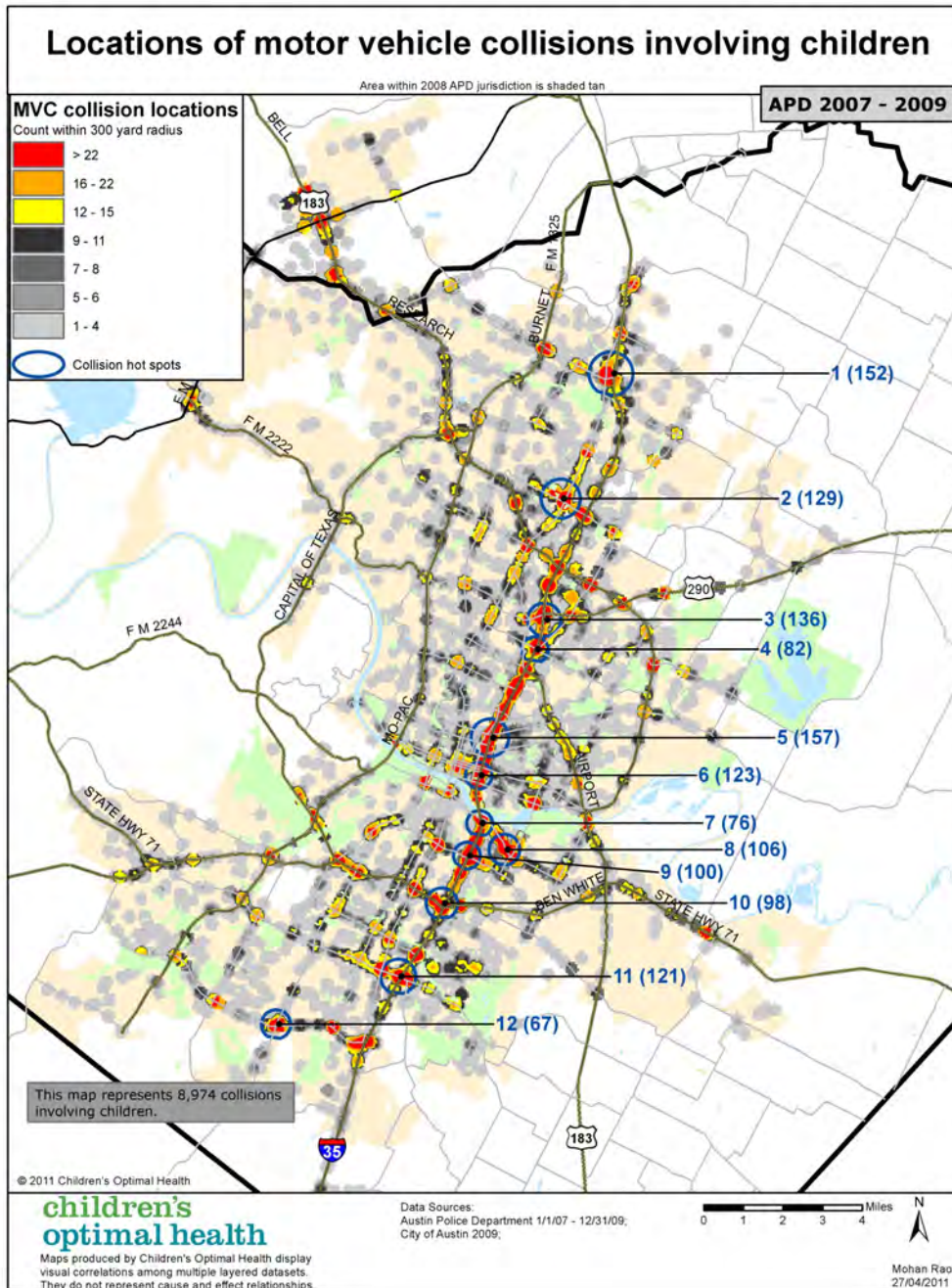
The maps in Group 1: Motor Vehicle Crashes Involving Children, visually demonstrate where motor vehicle collisions involving children occur and highlight a number of additional factors (e.g., time of day, alcohol involvement).

Potential uses include:

- Further study of the built environment, leading to environmental improvements (e.g., lighting, traffic signals, speed reduction measures)
- Allocation of law enforcement resources
- Driver education / skills training programs
- Placement of public awareness campaigns
- Coordination between local and state transportation entities

Group 1: Motor Vehicle Crashes Involving Children

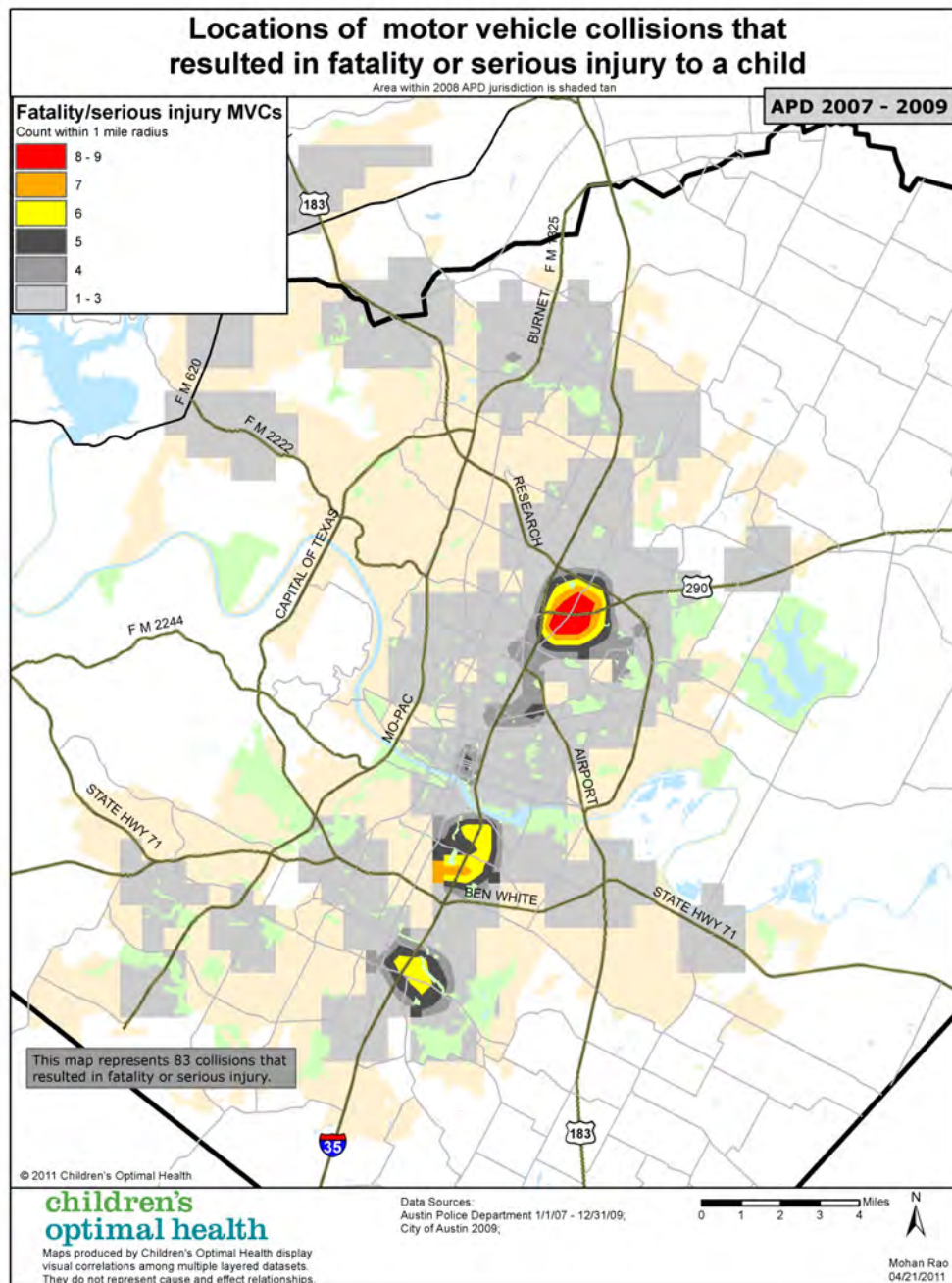
Observations



- This map shows the locations of 8,974 motor vehicle collisions involving children (ages birth through 17).
- Incidents in the maps were recorded by the Austin Police Department between January 1, 2007 and December 31, 2009. See Tables 1-3 and Chart 1 on page 20 and Tables 4-9 on page 21 for further information about citation types, insurance status, age and ethnicities of children involved in collisions.
- Children involved could have been driving or riding as passengers in one of the vehicles at the time of the collision.
- Collisions are concentrated along IH-35, and are especially concentrated at major exchanges, including Parmer Lane, Highway 290, from 51st through the Downtown streets, Riverside Drive, Oltorf and Ben White (Highway 71), and William Cannon.
- There are high concentrations along Riverside Drive east of IH-35, at the intersection of Rundberg Lane and Lamar Blvd, and at the intersection of Slaughter Lane and Manchaca Road.
- These roadways are managed by both the City of Austin and the Texas Department of Transportation. This map may be useful to enhance conversations between the two agencies focused on child passenger safety, as well as identifying priorities for future study.

Group 1: Motor Vehicle Crashes Involving Children

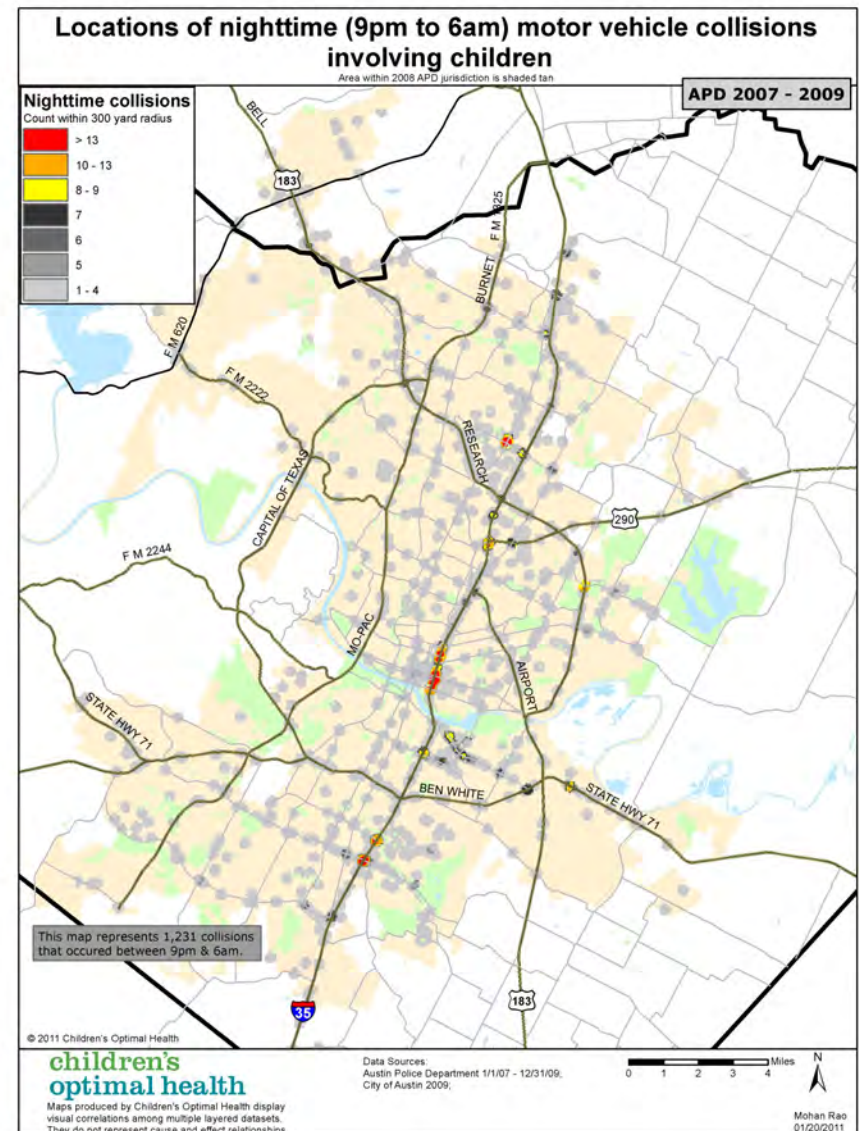
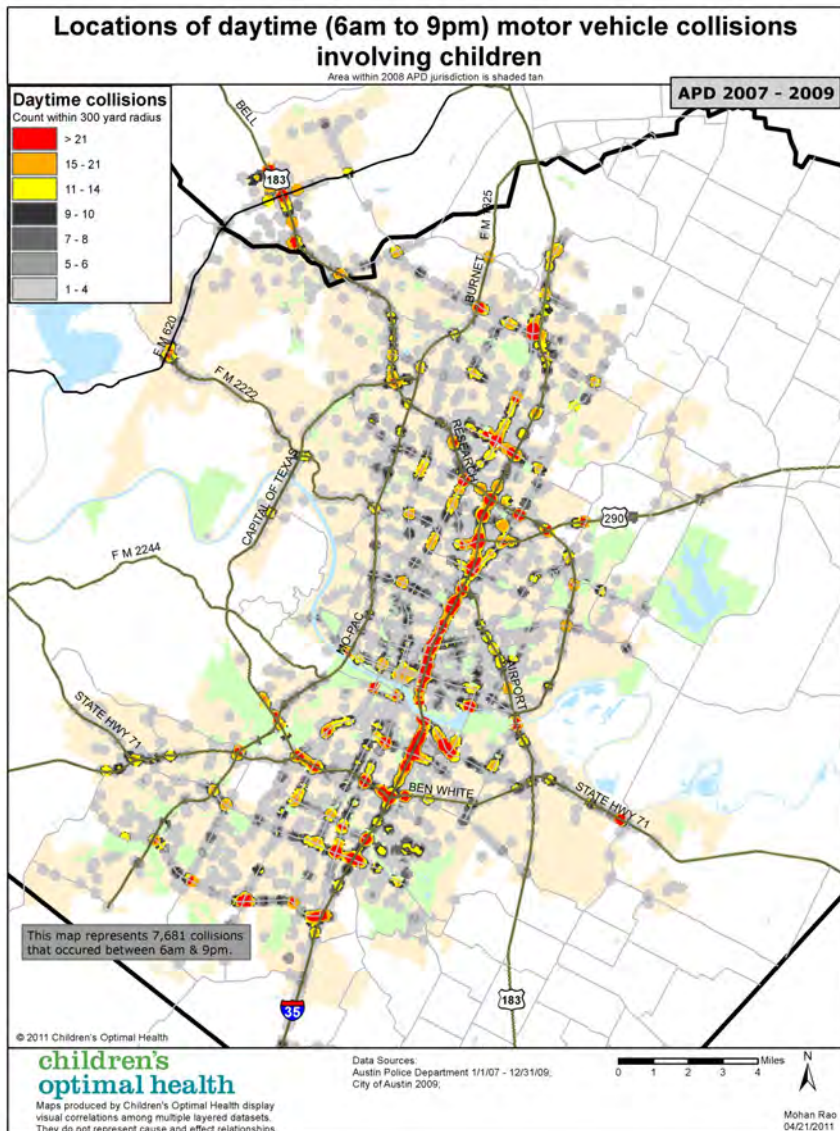
Observations



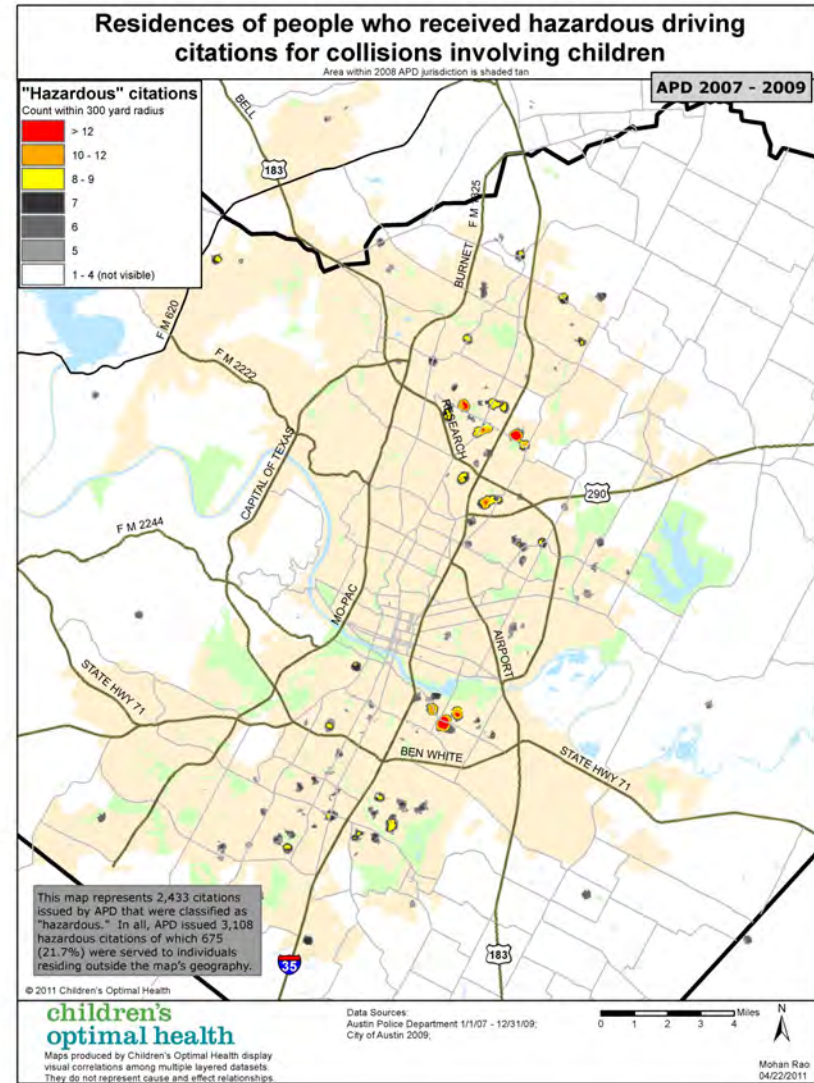
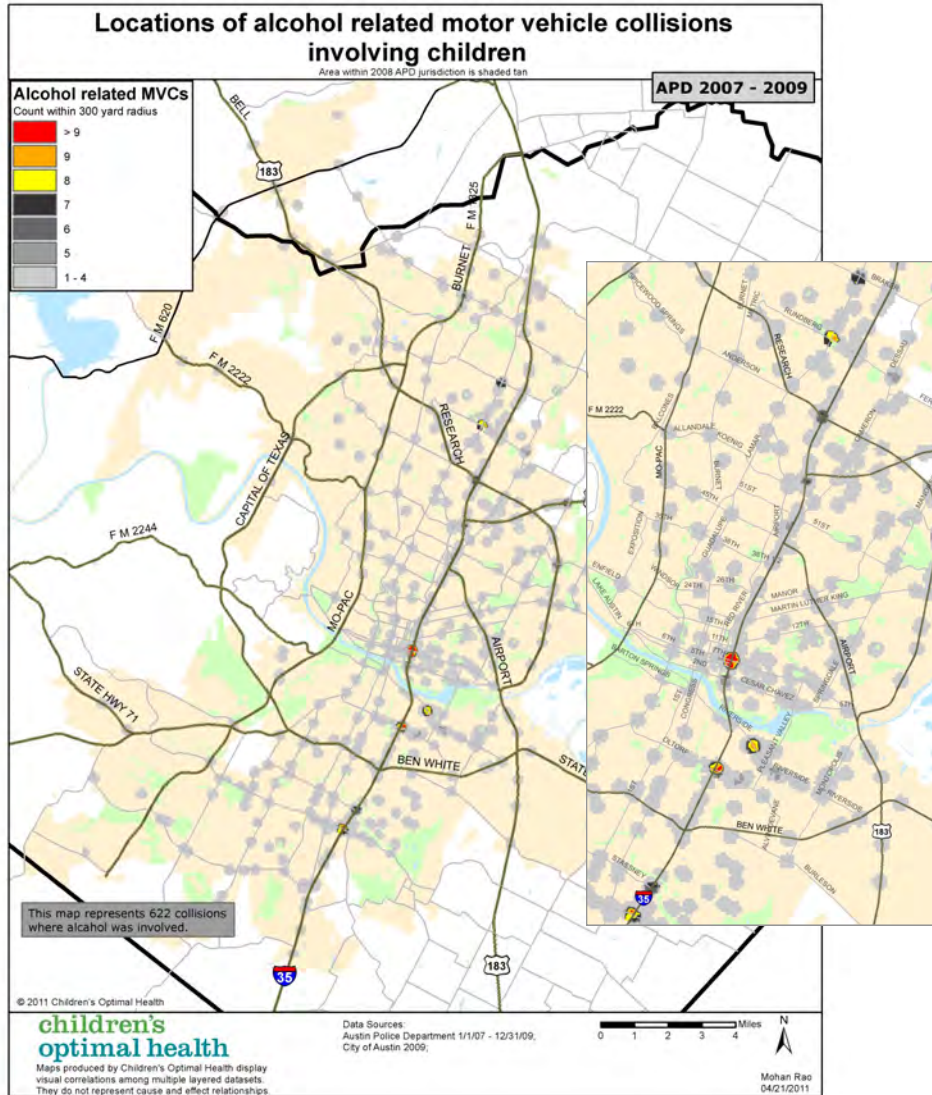
- This map displays concentrations of the 83 collisions that resulted in either a child fatality or serious injury to a child. See data set descriptions (APD) on page 24 for definitions and further information.
- The most concentrated area is located at the intersection of Highway 290 at Cameron Road, east of IH-35. An additional concentration is located along IH-35 south of Oltorf and north of Ben White Blvd. (Highway 71).
- Children are more likely to die or sustain serious injuries in motor vehicle collisions if they are improperly restrained at the time of the collision. Additional factors can include collision speed, vehicle safety and roadway design.
- Further study of these areas is needed to determine if changes to the environment could reduce the number of collisions as well as the severity of the collisions.
- This map may be useful to law enforcement for planning education and enforcement campaigns for child restraint utilization. This information may also be useful in the planning and placement of public awareness messaging regarding the proper restraint of passengers

Group 1: Motor Vehicle Crashes Involving Children

- These maps compare 7,681 collisions occurring in daytime hours to 1,231 collisions occurring at night, involving children. The majority of child-involved collisions occurred during daytime hours and follow the same pattern as the map of all child-involved collisions on page 4.
- Nighttime collisions appear to be clustered in just a few areas, with a series of clusters forming around the intersections of downtown streets and IH-35. Further study could determine if certain factors, such as roadway lighting or concentrations of intoxicated drivers, may be contributing to the nighttime collision pattern.



Group 1: Motor Vehicle Crashes Involving Children



Observations

- In 662 collisions, the Austin Police Department issued a citation for alcohol impairment.
- This map may be useful for law enforcement efforts to prevent intoxicated driving collisions.

Observations

- This map, in contrast with previous maps, shows the *home locations* of individuals who received citations for hazardous driving.
- Hazardous driving citations encompass a range of offenses, including distracted driving and intoxicated driving. This map could be useful for determining the need for and allocation of driver education programs.
- For more information on citations served see Tables 4 and 5 on page 21.

Group 1: Motor Vehicle Crashes Involving Children

Observations



- This map zooms in on one of the most concentrated areas of collisions from the Map on page 4 (the exchange at Highway 290 and IH-35).
- Please note that higher bars represent higher numbers of collisions.
- This map demonstrates the complexity of the roadways and the density of collisions shown in the concentrated areas. Detailed maps of this nature could be used to identify specific locations where collisions are occurring.

Group 2: Child Passenger Safety: Restraint Use and Resources

Introduction

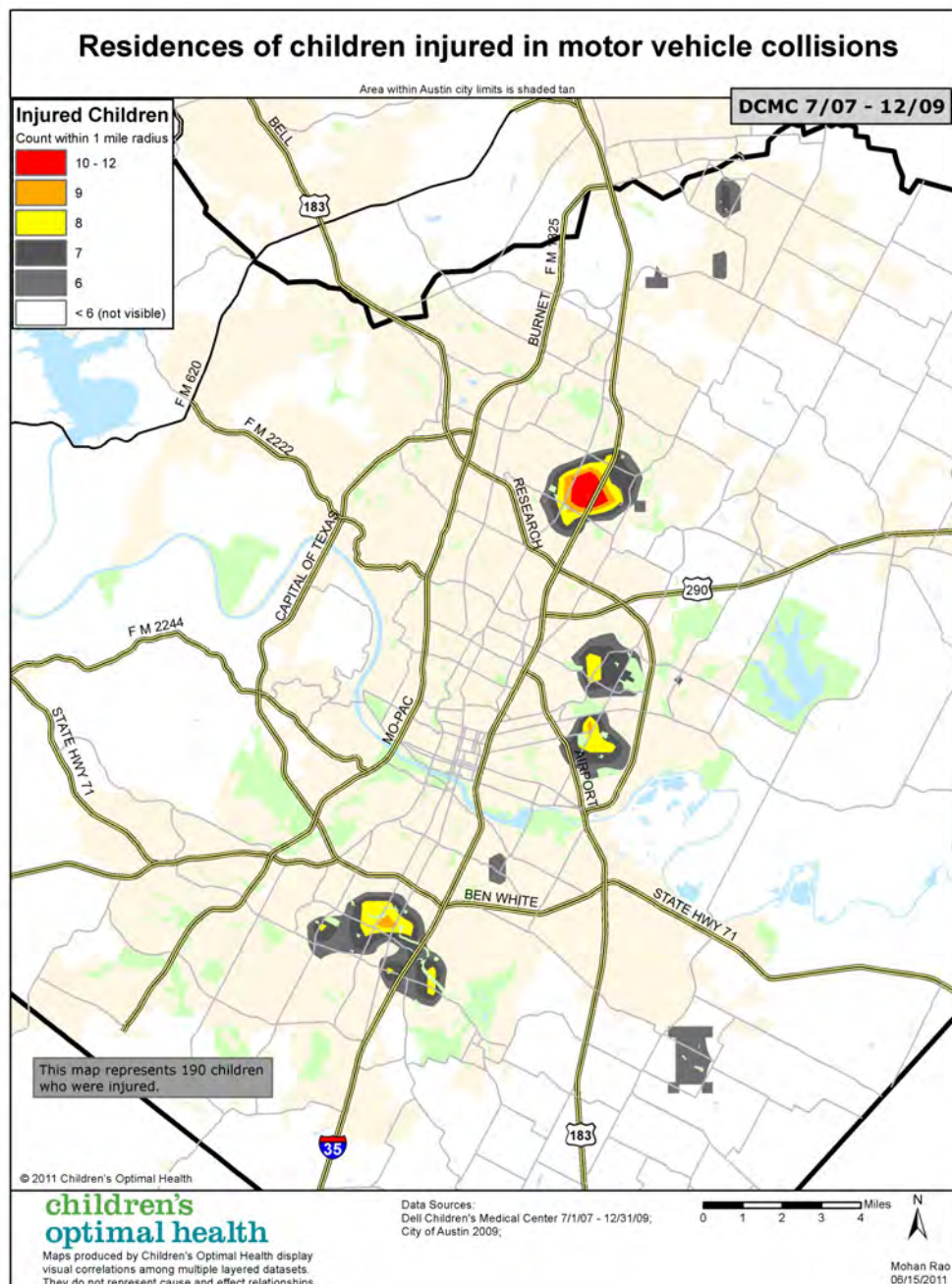
The maps included in Group 2: Child Passenger Safety: Restraint Use and Resources show the home locations of children injured in motor vehicle crashes, highlighting restraint use, and the spatial relationships between the residential clusters and child safety seat education and resource programs (e.g., community-based car seat distribution programs).

Potential uses include:

- Reallocation of existing child transportation safety education and resource programs to areas where clusters of injured children are located
- Prioritization of locations for new child safety seat education programs
- Allocation of law enforcement resources (e.g., enforcement of child passenger restraint laws)
- Placement of public awareness campaigns

Group 2: Child Passenger Safety: Restraint Use and Resources

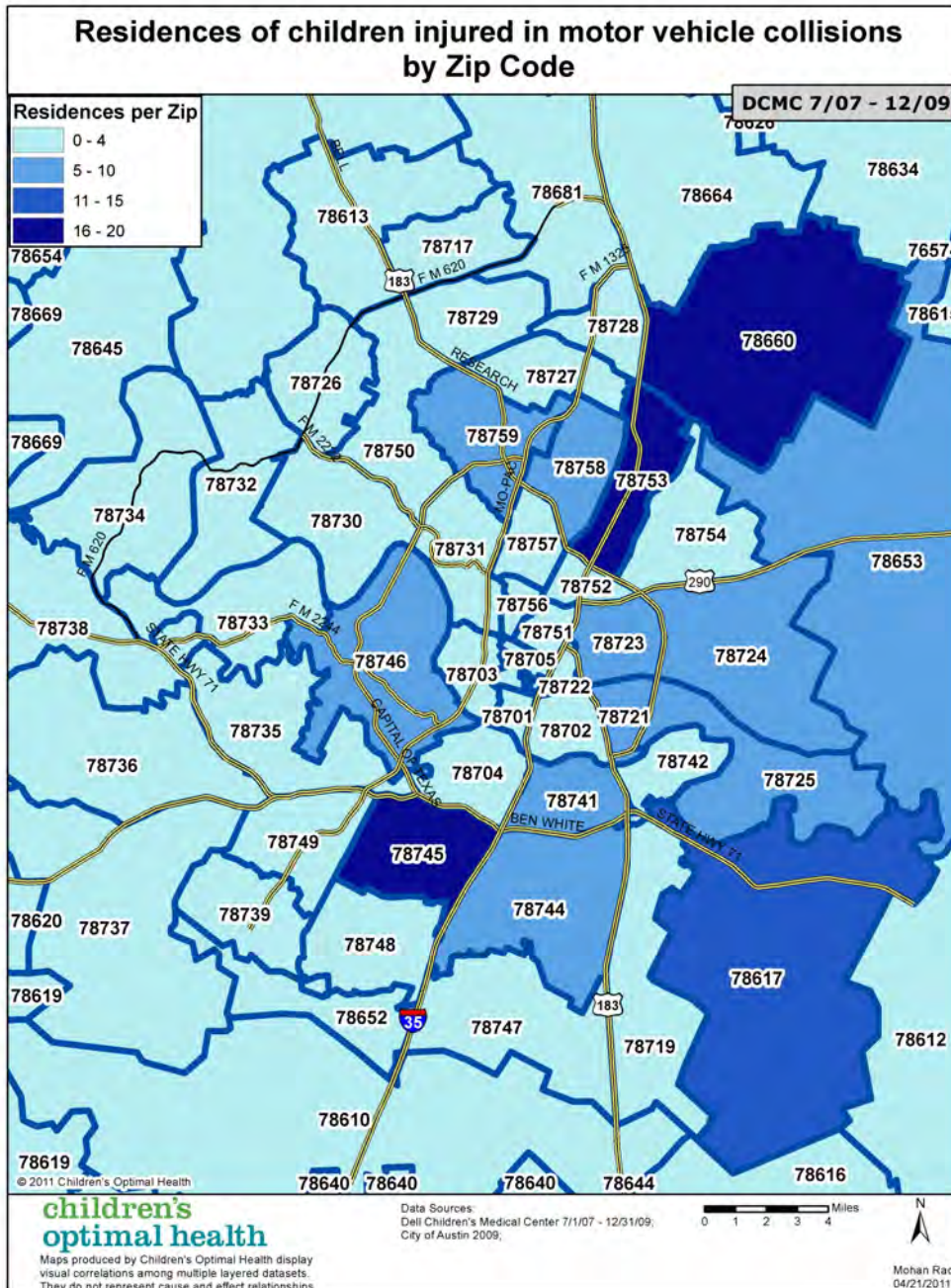
Observations



- This map displays the home residences of 190 children who were injured in motor vehicle collisions from July 1, 2007 to December 31, 2009, and were treated at Dell Children's Medical Center.
- These children were either known to be injured, or the circumstances surrounding the collision (e.g., speed of the collision, ejection from the vehicle) created concern that they were likely to be injured.
- Upon arrival at Dell Children's these patients were examined, and treated if needed, by the Trauma Service, and data about their visit was entered into the Dell Children's Trauma Registry.
- The largest concentrations of children injured in motor vehicle collisions are located in North Austin, North and Central East Austin, and Southwest Austin.
- This map is useful for allocating resources for child safety in vehicles (e.g., car seat programs) to areas where the most families and children are impacted by motor vehicle collisions.

Group 2: Child Passenger Safety: Restraint Use and Resources

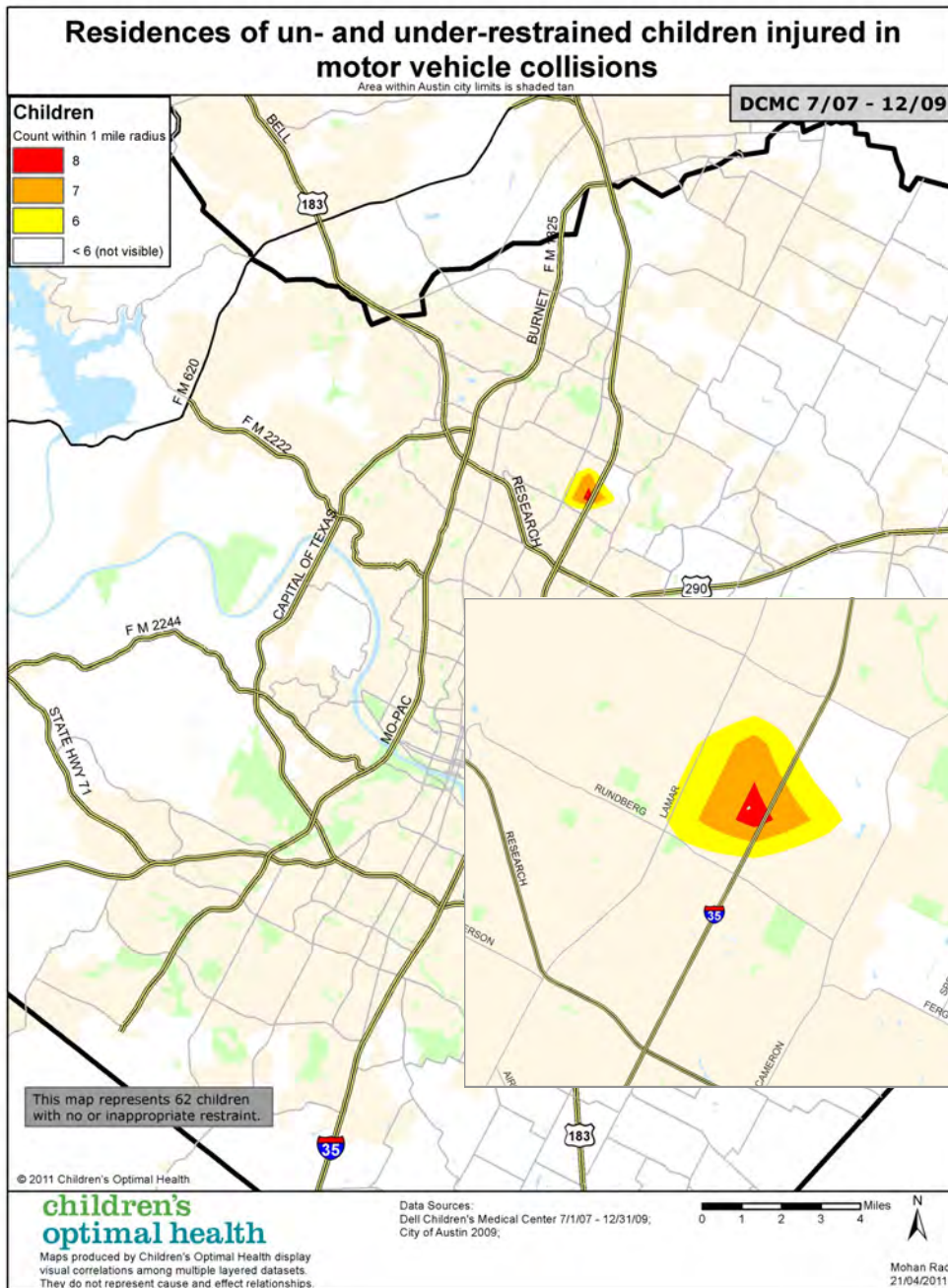
Observations



- This map also displays the home residence of all children injured in motor vehicle collisions, but the density of injured children is arranged by zip code.
- This map is useful for targeting education and resources, especially for community agencies who plan programs based on zip code, or who use zip code level data (e.g., US Census Data) for assessments and reporting.
- For a zip code level scale, this map uses a larger geographic area for mapping so that additional data can be displayed without risking the patients' confidentiality. This enables the identification of an additional area of concern in Southeast Austin, in zip code 78617.

Group 2: Child Passenger Safety: Restraint Use and Resources

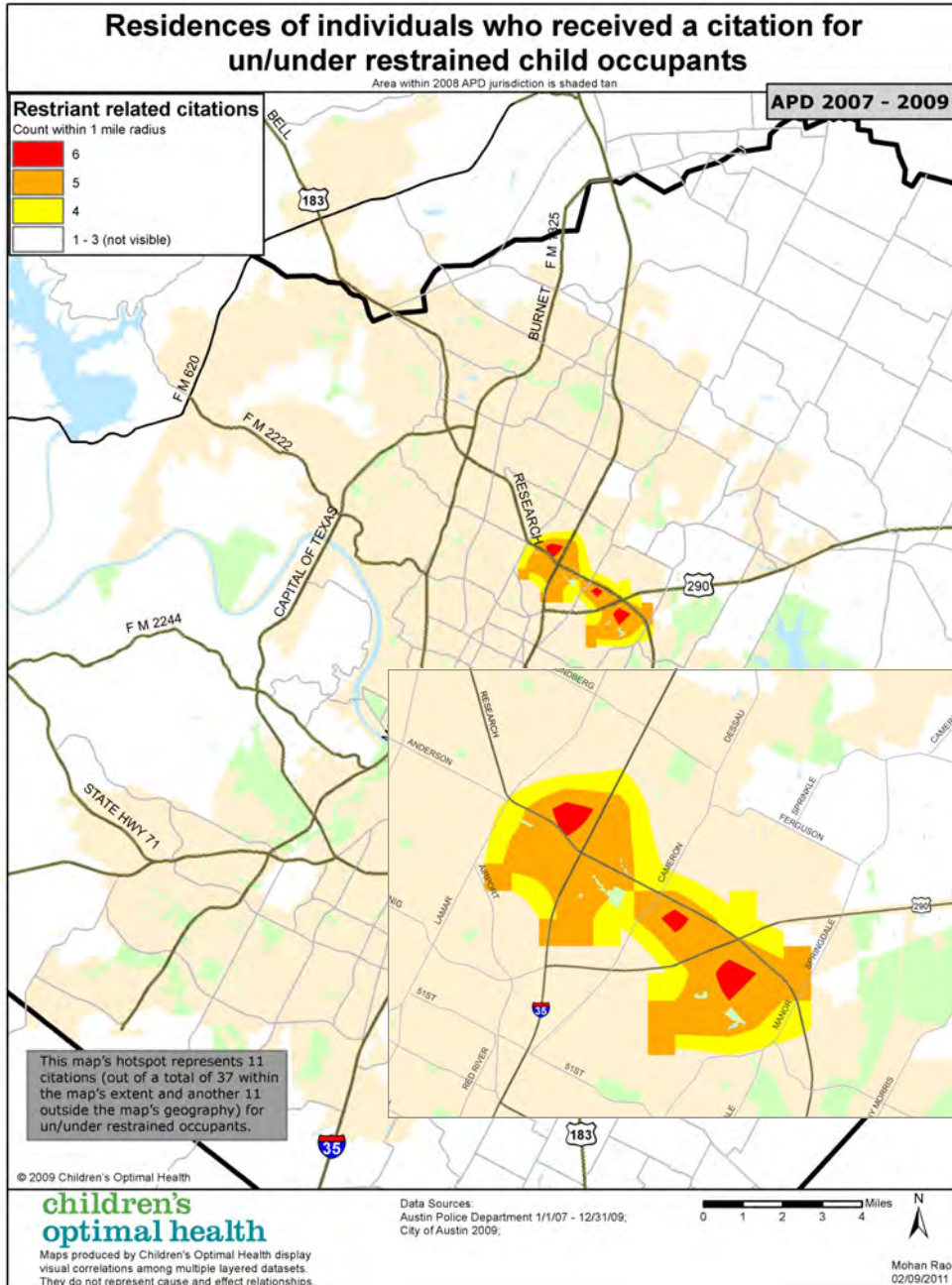
Observations



- This map shows the home residences of 62 children who were either completely un-restrained or were under-restrained at the time of injury in a motor vehicle collision. This data was collected from the Dell Children's Trauma Registry.
- Children who are not safely restrained at the time of motor vehicle collisions, have a greatly increased risk of serious injury, disability and death.
- Children were considered un-restrained if they were not wearing a seat belt or secured in a car seat at the time of the collision.
- Children were considered under-restrained if they were using a restraint system inappropriate for their age and weight. For example, a three year old child who was using a seat belt instead of a car seat would have been considered under-restrained.
- Children were considered properly restrained if they were using a restraint system appropriate for their age and weight, in accordance with Texas law.

Group 2: Child Passenger Safety: Restraint Use and Resources

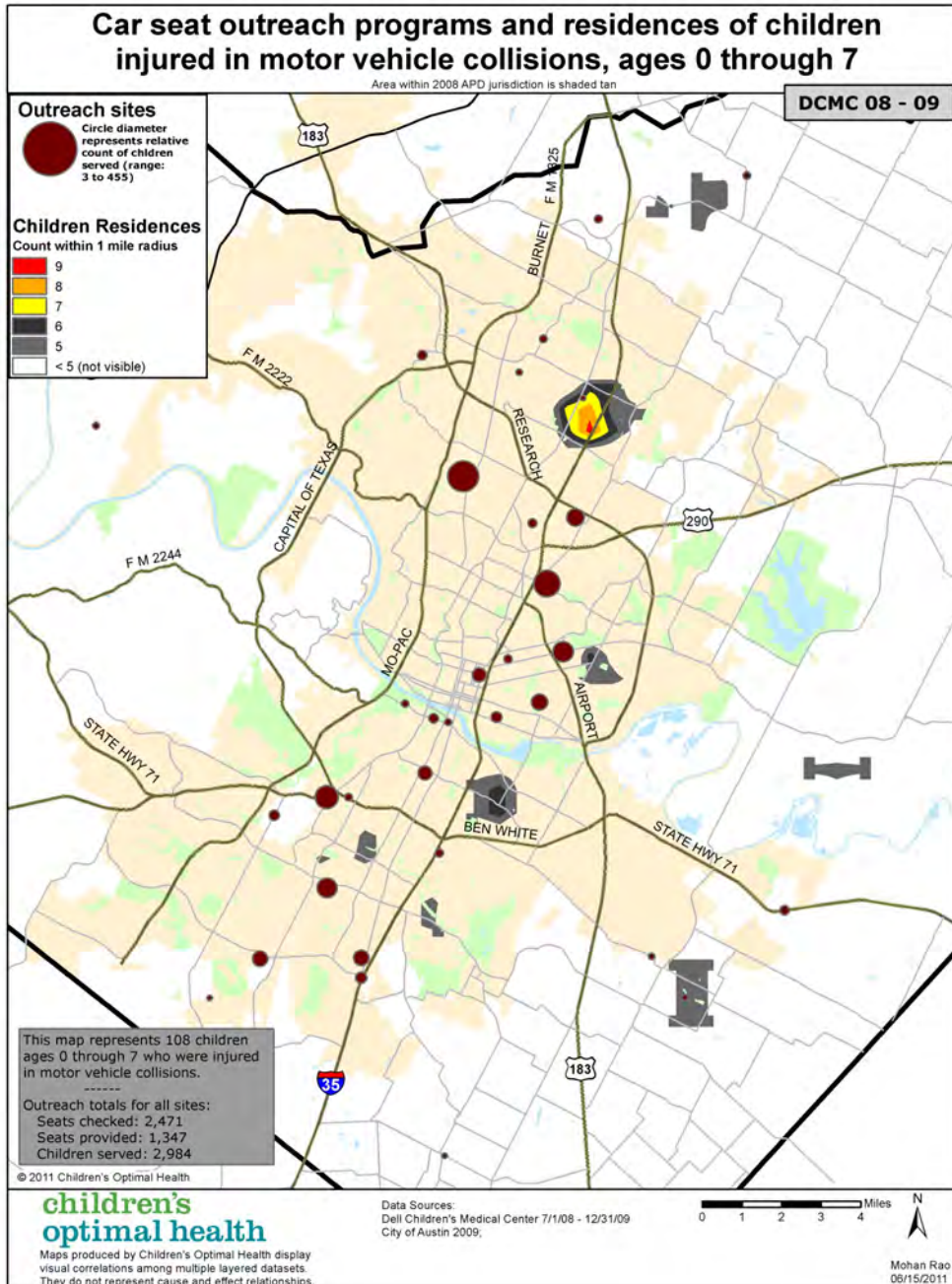
Observations



- This map displays concentrations of the home locations of drivers receiving citations for un- or under-restrained child occupants in vehicles. This data was collected from the Austin Police Department.
- These children, according to the police officer administering the citation, were not restrained according to the Texas law.

Group 2: Child Passenger Safety: Restraint Use and Resources

Observations



- Children under the age of 8 are required by Texas law to use a car seat of some kind (an infant or toddler car seat, or a booster seat).
- In Central Texas, there are three agencies (pg. 24) serving as the primary resources for car seat education and free or reduced-price car seats. These resources primarily do one of the following three activities: (1) provide a car seat inspection, (2) provide a car seat and a car seat inspection, or (3) provide a car seat and classroom instruction.
- Car seat inspections consist of one-on-one sessions between certified car seat technicians and caregivers in the caregiver's vehicle. The goal of a car seat inspection is to ensure the car seat fits the child, fits the vehicle, and is used safely, in accordance with the vehicle and car seat manufacturer's instructions. In a nutshell, car seat inspections teach parents to use car seats correctly.
- Provision of a car seat along with education (either through a class or a car seat inspection), is widely known to be a very effective strategy for preventing injuries to children in motor vehicle collisions.
- This map shows the location of car seat resources and their proximity to areas where children injured in motor vehicle collisions live. Only children who fall within the age range of children who are required to use car seats (0 to 7 years) are included on this map.
- This map is important for generating community discussion about the placement of future car seat resources.

Group 3: Child Pedestrian and Cyclist Injuries

Introduction

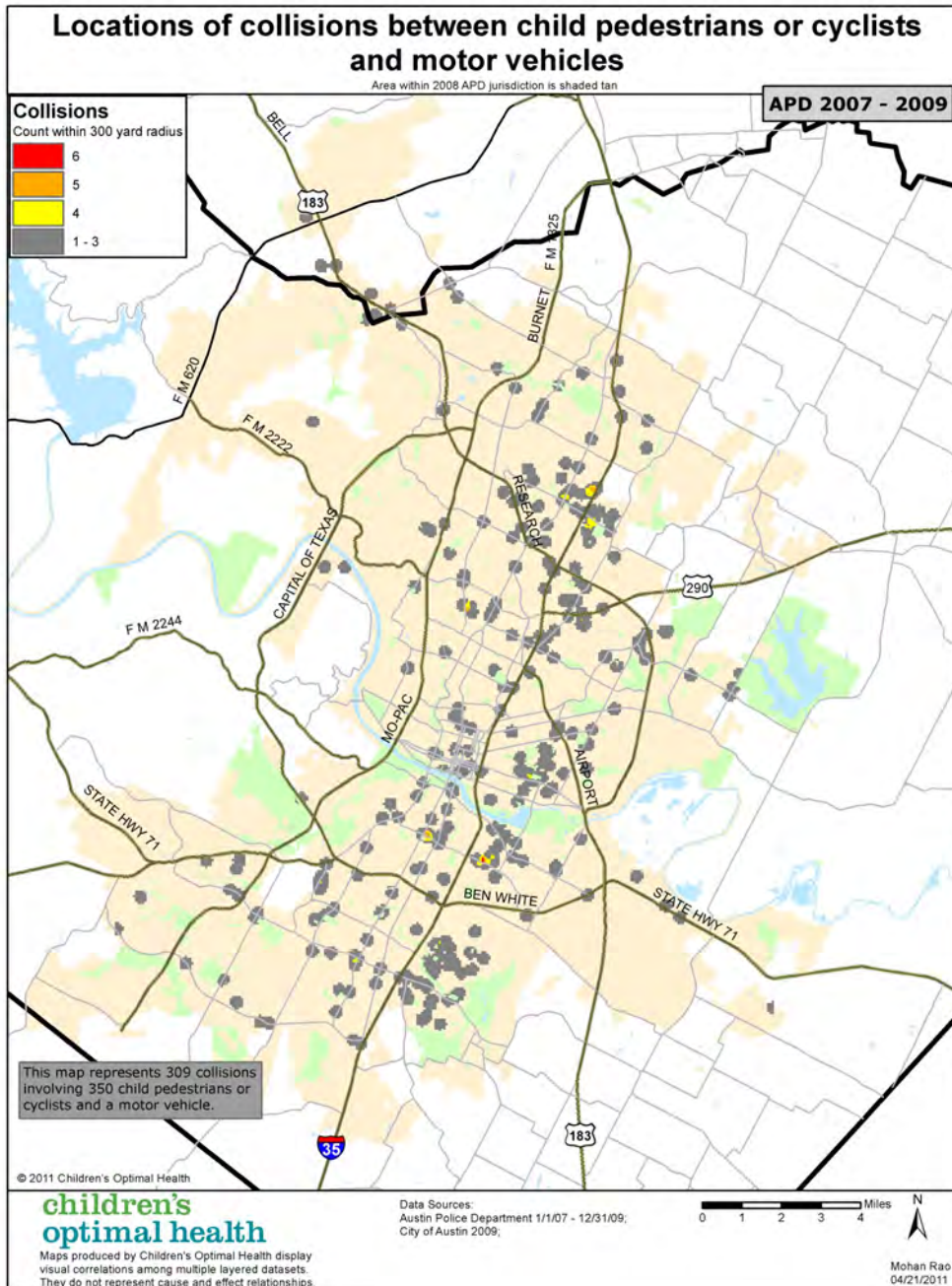
The maps in Group 3: Child Pedestrian and Cyclist Injuries show the locations of child pedestrian and cyclist collisions. This group includes a ranking of collision clusters that allow for prioritization of areas for future study.

Potential uses include:

- Further study of the built environment, leading to environmental improvements (e.g., crosswalks, pedestrian signaling, signage)
- Allocation of law enforcement resources (e.g., school zone enforcement)
- Placement of pedestrian, cyclist and parent education programs
- Placement of public awareness campaigns

Group 3: Child Pedestrian and Cyclist Injuries

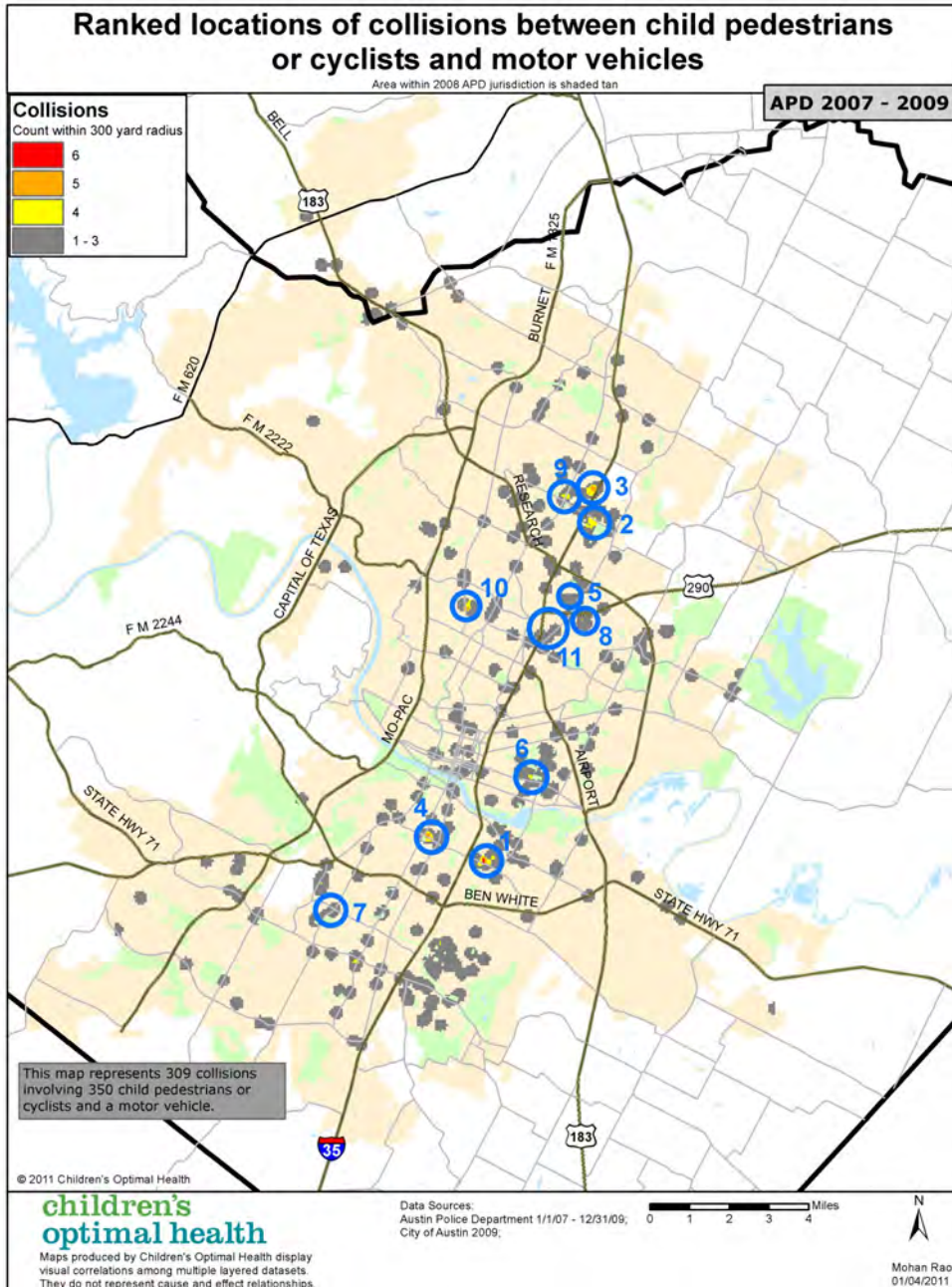
Observations



- This map shows the locations of 309 collisions involving a motor vehicle and a child pedestrian or cyclist from January 1, 2007 to December 31, 2009.
- See Tables 10 and 11 on page 22 for the number of child pedestrians or cyclists involved in collisions by gender and injury severity.

Group 3: Child Pedestrian and Cyclist Injuries

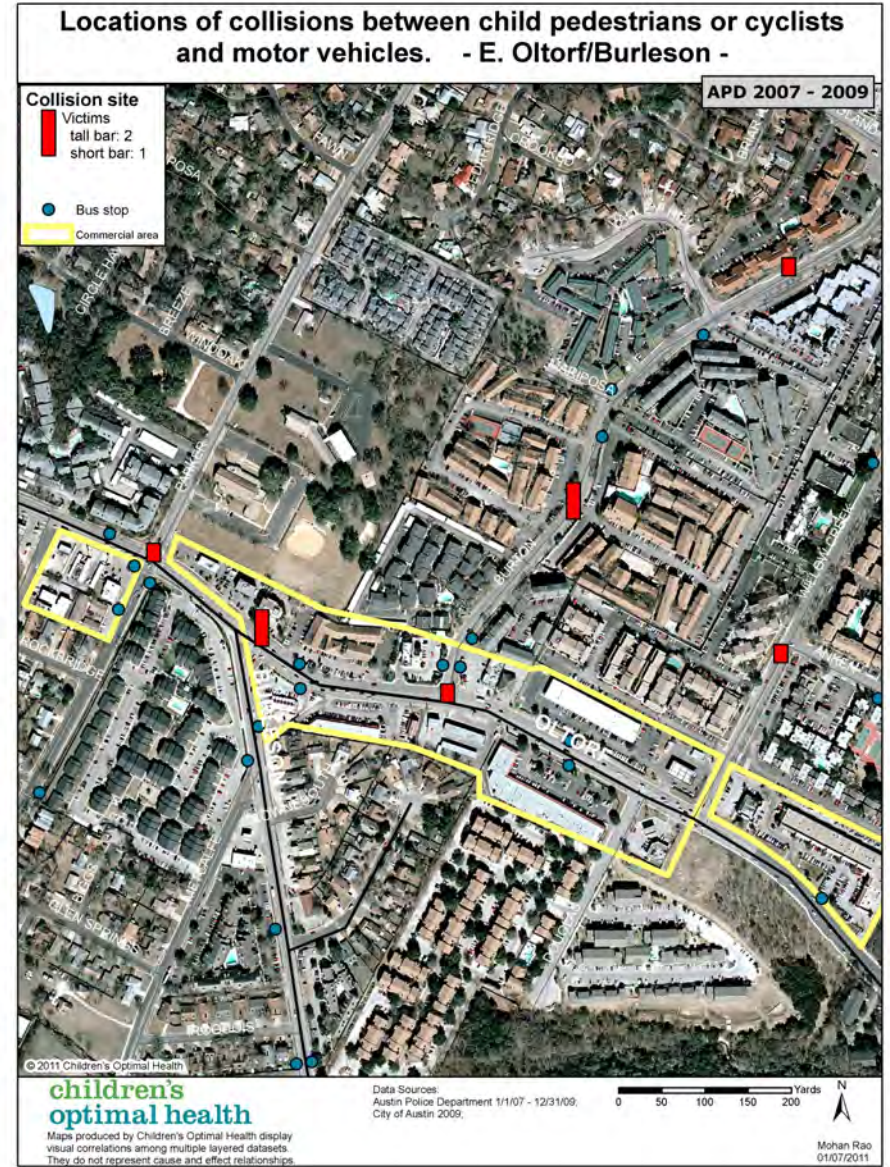
Observations



- This map is identical to the first map in Group 3, except that the collision locations have been grouped and ranked according to how many collisions occur within a small geographic area.
- These rankings are based on the number of collisions, however, when the numbers between areas were the same, the severity of the collisions (i.e., whether they resulted in injury or death) was used to select a higher vs. lower ranking. Area 1 is the area with the highest number of collisions; area 11 has the 11th highest number of collisions.
- Ranking the intersections is helpful in identifying priority areas for analysis and allocation of resources for improvements to the built environment (e.g., pedestrian crosswalks and signals).

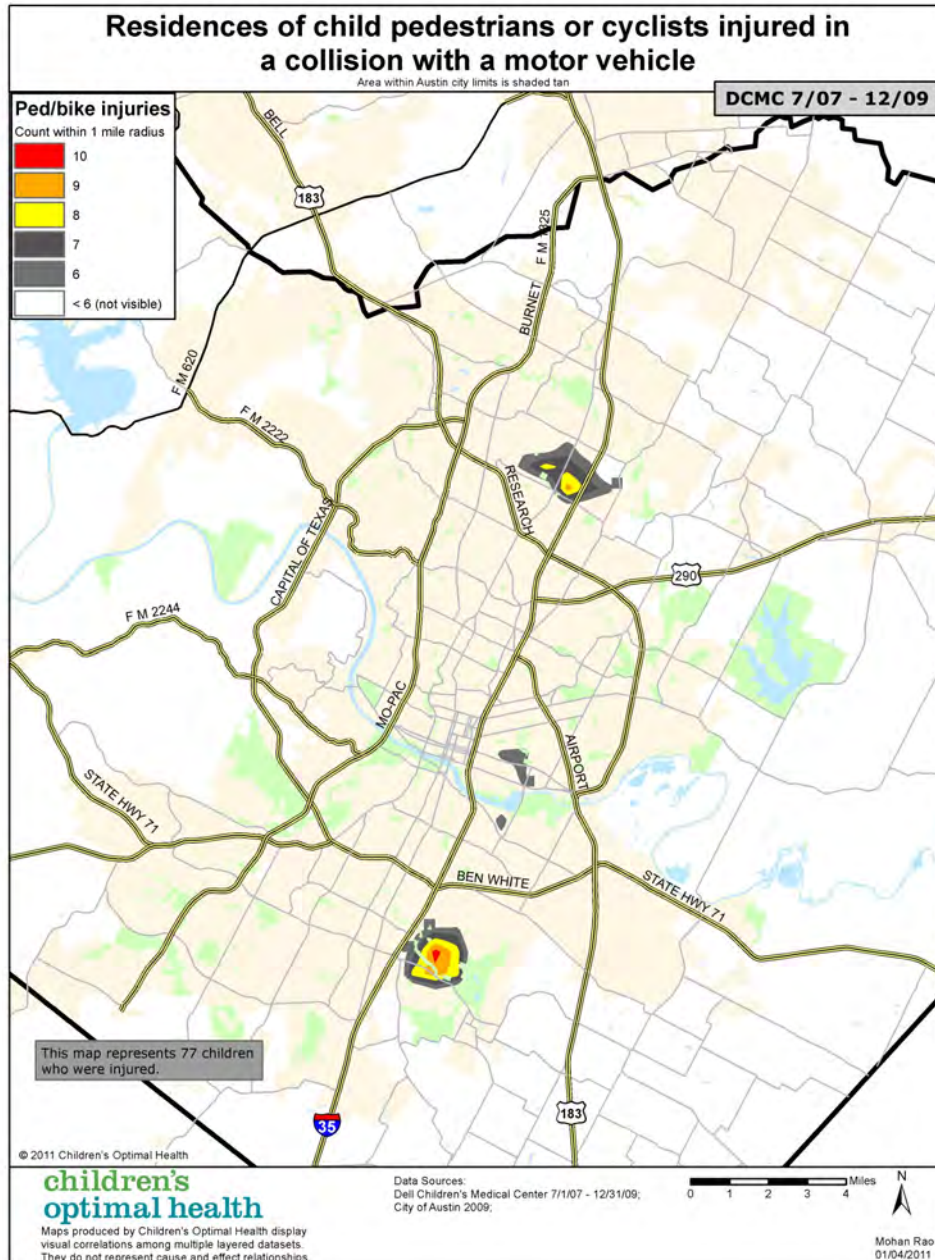
Group 3: Child Pedestrian and Cyclist Injuries

- These maps display additional views of the highest ranked intersection from the previous map (pg. 17).
- These 'drill down' maps allow for in-depth study of the intersections of most concern. The built environment adds a great deal of information about the intersection. In this case, we see very dense multi-family housing interacting with large businesses and busy roadways.



Group 3: Child Pedestrian and Cyclist Injuries

Observations



- This map shows the home locations of children who were injured in a collision with a motor vehicle while acting as a pedestrian or a cyclist, from July 1, 2007 to December 31, 2009, and were treated at Dell Children's Medical Center.
- These children were either known to be injured, or the circumstances surrounding the collision created concern that they were likely to be injured. Upon arrival at Dell Children's these patients were examined, and treated if needed, by the Trauma Service, and data about their visit was entered into the Dell Children's Trauma Registry.
- This map may be especially helpful in allocating resources for community and family education about pedestrian and cycling safety, including the need for appropriate supervision.

Data Tables

Table 1	
Motor Vehicle Collisions Involving Children by Year	
<i>Source: Austin Police Department Collision and Citation Data Survey January 1, 2007 - December 31, 2009</i>	
Year	Count
2007	3352
2008	2885
2009	2737

Table 2	
Motor Vehicle Collisions Involving Children by Citation Types	
<i>Source: Austin Police Department Collision and Citation Data Survey - January 1, 2007 - December 31, 2009</i>	
Accident Type	Count
Alcohol related collisions	622
Collisions that resulted in DWI arrest	515
Red light related collisions:	835
Speed related collisions	1363
Inattention related collisions	2907
Failure-to-maintain-distance related collisions	2442
Failure-to-yield related collisions	2083
Left turn related collisions	1646

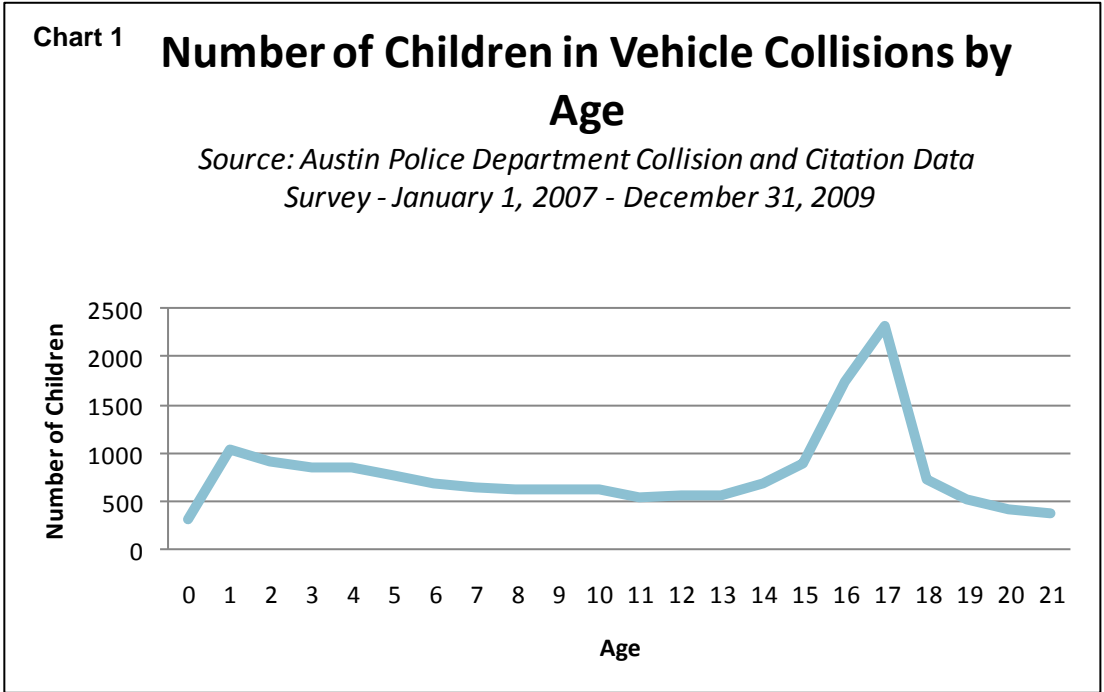


Table 3																						
Number of Children in Motor Vehicle Collisions by Age																						
<i>Source: Austin Police Department Collision and Citation Data Survey - January 1, 2007 - December 31, 2009</i>																						
Age	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Number of Children	308	1035	913	854	842	755	686	648	628	625	628	541	556	551	684	889	1733	2317	731	508	417	364

Data Tables

Table 4

Number of Citations Served to Individuals by Age
 Source: Austin Police Department Collision and Citation Data Survey - January 1, 2007 - December 31, 2009

13	4
14	11
15	41
16	205
17	482
18	485
19	263
20	247
21	234

Table 5

Percent of Collisions by Number of Citations Served for Collision
 Source: Austin Police Department Collision and Citation Data Survey - January 1, 2007 - December 31, 2009

Number of Citations Cited Per Collision	Percent of total Collisions
0	57.30%
1	25.00%
2	11.00%
3	5.40%
3 or more	1.20%

Table 6

Number of Children Involved in Motor Vehicle Collisions, by Gender
 Source: Dell Children's Medical Center Trauma Data Survey -

Gender	Count
Female	94
Male	98

Table 7

Number of Children Involved in Motor Vehicle Collisions, by Age
 Source: Dell Children's Medical Center Trauma Data Survey -

Age	Count
0-4 Years	72
5-7 Years	37
8-14 Years	83

Table 8

Number of Children Involved in Motor Vehicle Collisions, by Ethnicity
 Source: Dell Children's Medical Center Trauma Data Survey -

Ethnicity	Count
Asian	10
Black	24
Hispanic	97
Other	6
White	55

Table 9

Number of Children Involved in Vehicle Collisions, by Insurance Status
 Source: Dell Children's Medical Center Trauma Data Survey -

Count	Pay Type
57	Privately Funded
100	Publically Funded
35	Uninsured

Data Tables

Table 10	
Gender of Child Pedestrians and Cyclists Involved in Collisions	
<i>Source: Austin Police Department Collision and Citation Data Survey - January 1, 2007 - December 31, 2009</i>	
Gender	Count
Female	122
Male	228

Table 11	
Number of Child Pedestrians or Cyclists by Injury Severity	
<i>Source: Austin Police Department Collision and Citation Data Survey - January 1, 2007 - December 31, 2009</i>	
Description of injury	Count
No Injury	41
Possible Injury	99
Minor	153
Serious and Incapacitating	40
Killed	4
Unknown	4

What can you and/or your organization do to prevent child transportation injuries?

Injury is the leading cause of death for children in our community – but it does not have to be. Most injuries are preventable. Here are some prevention strategies that you, your agency and your community may be able to engage in: Local Government:

- Use injury data to allocate resources for safety improvements (to intersections that are especially dangerous for child passengers, pedestrians and cyclists).
- Enforce Texas child occupant protection law, which is considered a “best practice” law by national standards.
- Invest in prevention programming.

Community Organizations

- Help parents find car seat inspection events and resources by visiting the Car Seat Calendar at: www.dellchildrens.net, or calling the Dell Children’s TOTS line: 512-324-TOTS. Consider becoming certified as a Child Passenger Safety Technician so that you can help with these efforts.
- Provide opportunities for families to receive safe transportation, pedestrian and cycling education. Educational presentations can be requested from the Safe Kids Speaker’s Bureau by visiting: www.dellchildrens.net/safekidsaustin

Parents and Neighborhoods

- Inform the City of Austin of dangerous areas for child passengers, pedestrians and cyclists by calling 311. Involve your neighbors in these efforts.
- Secure your children in a car seat or booster seat, according to the manufacturer’s instructions, until their 8th birthday, unless they are 4 feet 9 inches tall. Make sure everyone else in your vehicle is secured with a seat belt, no matter their age or seating position. Both of these tips reflect current Texas law.
- Make sure students in your community are receiving education on being safe pedestrians and cyclists. Set a good example while walking and biking with your children by following safety rules and wearing a bicycle helmet. Teach children safety behaviors while you walk and cycle together.

What is the community doing to address injury?

With a coalition of more than 30 local and state agencies, Safe Kids Austin works to prevent childhood injuries affecting the Central Texas Community. Transportation injuries are addressed through active task forces for both

child passenger safety and pedestrian/bike safety. Upon request, Safe Kids Austin provides educational materials, community presentations and car seat inspection events in targeted communities. Through these methods, Safe Kids Austin works to increase the number of parents and caregivers in Central Texas that utilize child safety seats for their children, as well as the number of families practicing pedestrian and bicycle safety strategies. Community partners in transportation safety include: Austin Cycling Association, Austin-Travis County EMS, Austin-Travis County Health and Human Services Department - Safe Routes To School Austin, City of Austin Child Safety Program, Texans In Motion at Scott & White Healthcare, Texas Office for Prevention of Developmental Disabilities, Texas Department of State Health Services - Safe Riders, Texas Transportation Institute and Travis County Sheriff’s Office.

Map Legend Conversion

Population densities are expressed as a count of individuals within a given area. For example, “12 taxable properties per acre” and “324 people per square mile” express densities of two different types of populations in appropriate areal units. Density in these maps is expressed in terms of the number of individuals residing within a 300 yard radius circle. Such an area is easy to visualize, is appropriately scaled to represent a “neighborhood,” and contains easily understood student counts between five and one hundred.

Since human population densities are often expressed as a count of individuals within a square mile, we provide a table to convert densities from “300 yard radius” units to square mile. As the table (see below) shows, a square mile has approximately 11 times the area of a 300 yard radius circle.

Count in 300 yd radius	Square Mile Equivalent *	Count in 300 yd radius	Square Mile Equivalent *
1	11	30	329
5	55	40	438
6	66	50	548
7	77	60	657
8	88	70	767
9	99	80	876
10	110	90	986
12	131	100	1096
15	164	150	1643
20	219	200	2191
25	274		

* Square mile equivalent is rounded to the nearest whole number

Child Injury Project Data Sources

Dell Children's Medical Center, July 1, 2007 – December 31, 2009:

The Trauma Service at Dell Children's Medical Center (DCMC) provided injury data for children between 0 and 14 years of age that were brought to DCMC. Data provided included child residence location, demographic information including age and sex, injury cause (which could be either "motor vehicle occupant," "pedestrian," or "bicyclist"), hospitalization duration, hospitalization discharge status, and protection device used at the time of injury (such as seat belt, car seat, or helmet).

Austin Police Department data, January 1, 2007 – December 31, 2009:

The Austin Police Department (APD) provided us data for the collisions where a minor (ages 0 through 17) was involved in some capacity (passenger, driver, or victim). Collision data included location (street intersection and geocoded x,y coordinates), date and time, collision type (such as motor-vehicle to motor-vehicle, motor-vehicle to pedestrian, etc.), injury severity, collision's cause (such as alcohol, failure-to-yield, etc.), and whether minors were inside and/or outside the involved vehicles. Accidents that resulted in a "fatality or serious injury," are included in this map report (page 5). The severity or seriousness of the injury is determined by the APD officer who filled out the accident report for the collision. It should be noted that there are no set criteria for determining injury severity.

APD also provided data for the citations served due to the collisions. Citation data included the age, gender, ethnicity, and residence location (shifted to protect the individual's privacy) of the individual who received the citation. The offense category of the citation (such as speeding, running a red light, etc.) was also provided.

Data describing the people involved in the collisions were also provided in two separate tables: one table for passengers inside a motor vehicle and another table for pedestrians and bicyclists. In either table, age, gender, ethnicity, residence location (shifted to protect privacy), role (such as passenger, driver, pedestrian, bicyclist) and injury sustained, if any, for the individuals are provided. For people inside a motor vehicle, restraint use and position within the vehicle are described. For bicyclists, helmet use is described. A common key is provided to link collisions, citations and people descriptions appropriately.

A special thanks to Sharon Bauer with Research and Planning at the Austin Police Department for her assistance in obtaining data.

Ms. Bauer's knowledge of the APD database was greatly appreciated.

Outreach Data Set

Data on car seat outreach programs was gathered from each of the three community resources providing services in the Austin area:

Safe Kids Austin: this organization is a collaboration of more than 35 community agencies concerned with child safety, led by Dell Children's Medical Center. Child passenger safety is one of the focus areas for Safe Kids Austin, which holds car seat inspection events at regular intervals.

Texans in Motion at Scott & White Healthcare: this organization receives funds from the Texas Department of Transportation to provide child safety seat education and resources in an 11-county region. Texans in Motion holds car seat inspection events at regular intervals in Travis County.

Department of State Health Services - Safe Riders: this organization provides car seat education and resources through two mechanisms: (1) classes attended by low-income families, where car seats are provided, and (2) car seat inspection events held at regular intervals.

Each agency provided data regarding locations of their inspection events or classes, the number of car seats inspected, and the number of car seats provided. At a car seat inspection event, certified child passenger safety technicians work with families to ensure their car seat is safe for use, is appropriate for the child, and is properly installed in the vehicle. At some events, agencies provide car seats to families who do not have a car seat, or who have a car seat that needs to be replaced.

Child Injury Project Limitations

The limitations of each data set may impact the way an individual map can be interpreted as well as the story a map appears to tell. For additional questions regarding specific datasets and limitations, please contact COH.

For the purposes of this map series, collision data was only obtained from APD and not from any of the surrounding police departments. The APD boundary is represented as the area shaded in tan. Because of this, COH cannot draw inferences for any of the areas outside of APD's jurisdiction and a lack of representation on the map does not necessarily represent a lack of need.

Among the multiple datasets incorporated in this project, the individual timeframes are not necessarily identical. Refer to the Data Sources sections for dataset timeframes.

Visual correlations on a map (e.g., proximity of individuals' residences receiving traffic citations to a highway) do not necessarily represent causality; for more information about related research or possibilities for further research, please visit www.childrensoptimalhealth.org.

COH Methodology

Many Children's Optimal Health (COH) maps display *density* distribution of some particular population of interest. Density maps show where high concentrations of the mapped population live. All COH density maps are rendered from raster datasets. Our GIS tool, ESRI's ArcMap 10.0, supports a variety of ways to calculate and display density maps. We chose a methodology that we believe strikes a proper balance between accuracy and ease of interpretation without compromising individual privacy.

Spatial Analyst's *Neighborhood Statistics* tool was used to create the population density maps. The density maps' grid cells are squares representing an area equal to 100 yards by 100 yards. If the population size is sufficiently large (greater than 200) neighborhood setting was set to a circle with a radius of 300 yards. For small populations (200 or less), the corresponding radius was set to one mile. The above parameters smoothed out the distribution of cell values to make the interpretation of hotspots easier to interpret visually, but retained enough locality to be meaningful at the neighborhood level.

All density maps were categorized into deciles¹ with the top 3 deciles symbolized as red, orange, and yellow (in descending order). The remaining deciles were symbolized in a grayscale with lighter shades representing lower deciles. The symbolization of deciles forms the consistent thread across all density maps.

Thus, although density values may vary greatly from map to map, the red areas on a density map always represent the top decile's density values. When mapping data where privacy regulations apply, for example, data covered under HIPAA or FERPA, all pixels with values less than or equal to 5 were symbolized to "no color" to protect individual privacy. For populations of more than 200, density is expressed in terms of the number of individuals within a 300 yard radius circle. For populations of 200 or less, density is expressed in terms of the number of individuals within a mile radius.

To meet privacy-protection requirements of individuals' data, residence location latitude and longitude values were randomly shifted anywhere from 100 to 300 feet. This shifting can introduce significant errors for density values at the cell level. But at the neighborhood level, for example for a one mile by one mile zone, a shift of up to 300 feet does not significantly alter the overall distribution of the population within the zone. However, it is important to remember that the density value of a specific cell can vary substantially from the cell's true value due to the shifting algorithm used to protect privacy. Therefore, it is **not** appropriate to use density maps at a city block level.

For further information regarding the COH mapping methodology, contact Mohan Rao at mrao@childrensoptimalhealth.org.

¹ Decile: any one of nine numbers that divide a frequency distribution into 10 classes such that each contains the same number of individuals; **also: any one of these 10 classes** (source: Merriam-Webster).

How to Get Involved

If you are interested in gaining more information about the partners working with COH to address the issue of obesity, please visit www.childrensoptimalhealth.org or you can contact COH at (512) 324 – 5980.

About COH

Children's Optimal Health is a collective leadership initiative that unites the efforts of Central Texas organizations in promoting community change to help our children reach a brighter future.

COH strives to give agencies and communities access to formerly proprietary data by using GIS mapping to illuminate issues involving Central Texas children. By layering data from multiple sources, COH can help communities visualize the health of their neighborhoods, identify assets and needs, and unearth opportunities for collaborative change.

Through a commitment to shared data, collaboration, and ongoing communication, Children's Optimal Health is a collective leadership initiative to ensure that every child in Central Texas becomes a healthy, productive adult engaged in his or her community.

The goal of COH is to use visual images to inform policy, improve operations, promote research, and mobilize the community to better the lives of our children and youth.

Children's Optimal Health would like to acknowledge Paula Yuma, MPH, CHES, Injury Prevention Coordinator with Dell Children's Medical Center's Injury Prevention Program for her central role in the planning, development, writing, and execution of this project.

Children's Optimal Health

1345 Philomena St., Suite 350
Austin, TX 78723
(512) 324 – 5980

Maureen Britton, Executive Director
Dr. Susan Millea, Community GIS Facilitator
Matt Balthazar, Project Coordinator
Mohan Rao, Spatial Data Analyst
Lindsey Ripley, Project Manager

COH would like to extend special recognition and thanks to the Technical Advisory Committee for the time and effort they have dedicated to ensure the integrity of this project.

Co-Chairs:

Dr. Stephen Pont, Medical Director, Texas Center for the Prevention and Treatment of Childhood Obesity, Dell Children's Medical Center, Medical Director, Austin ISD Student Health Services, UT Southwestern, UT-Austin Department of Advertising

Dr. Steve Kelder, Professor, Division of Epidemiology, Co-Director, Michael & Susan Dell Center for Advancement of Healthy Living, UT School of Public Health Austin Campus

Participants: Dr. Anjum Khurshid, Beth Peck, Dr. Bill Sage, Dr. David Warner, Jesse Simmons, Dr. Paul von Hippel, Dr. Roberto Rodriguez, Dr. Karla Lawson, Tareka Wheeler