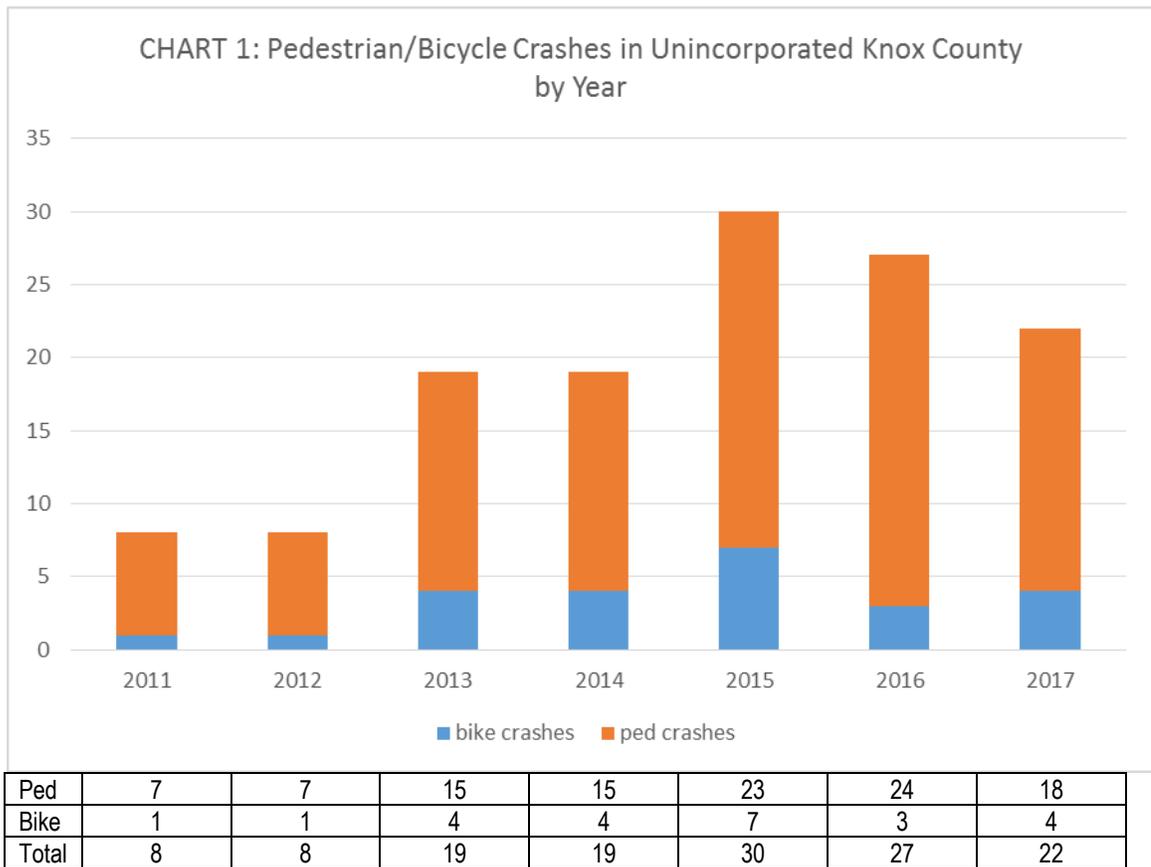


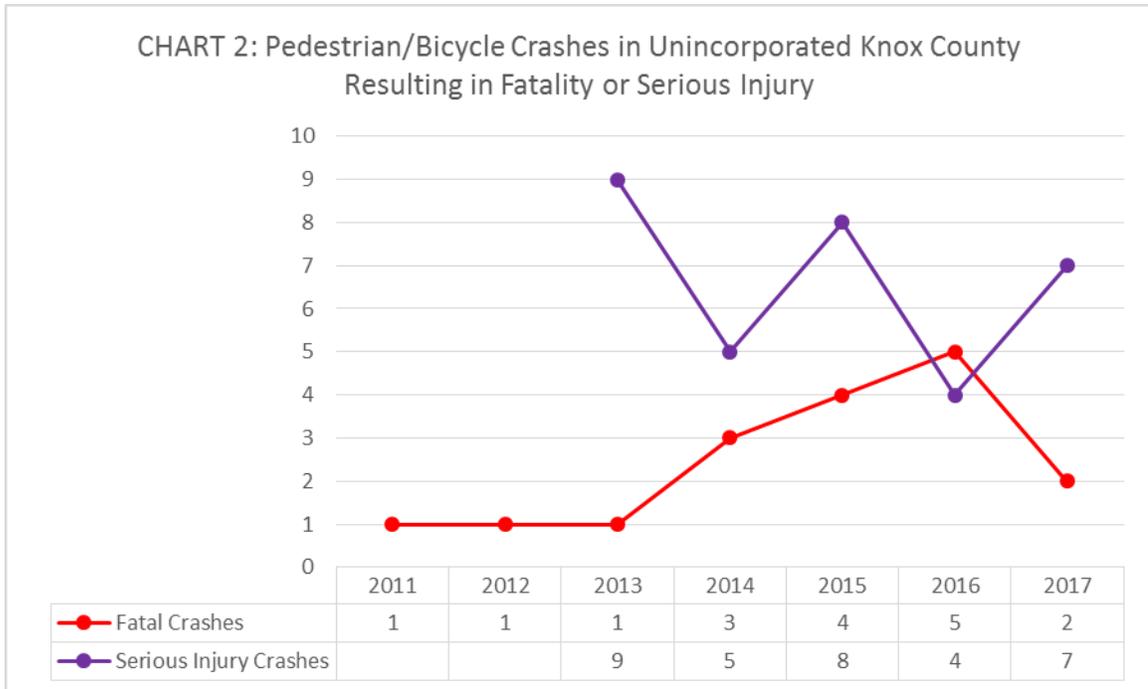
Knox County ped/bike crashes: Jan. 2011-March 2018

Overview

- Between January of 2011 and March of 2018, there were 135 crashes involving either pedestrians or bicyclists. This results in a rate of 1.6 crashes per month, 18.6 crashes per year.
- 109 crashes (81 percent) involved pedestrians, while 26 involved bicyclists.
- Almost all of the crashes (126, or 93 percent) involved the injury or death of a person walking or bicycling.
 - 109 crashes involved injuries only, and another 17 involved a fatality. All of the fatal crashes involved a person walking.
 - Between January 2013 and March 2018, 30 percent of injury-only crashes involved serious injuries.¹
- Chart 1 shows the number of crashes by year. Chart 2 shows the number of fatal and serious injury crashes by year.



¹ Crash reports rank the severity of crashes as either fatal, suspected serious injury, suspected minor injury, possible injury, or no injury. Suspected serious injury crashes used to be reported as “incapacitating,” and suspected minor injury were reported as “non-incapacitating.” For this report, suspected serious and incapacitating crashes are combined as “serious injury” crashes. Knox County crash reports began to include reliable information about the severity of injuries in 2013.



- The location of 4 crashes (3 percent) is uncertain because of incomplete information in the crash reports. This report focuses on the 131 remaining crashes where the location is certain.
- Major arterials make up 1.4 percent of the surface street mileage within Knox County. A disproportionate share of pedestrian/bicycle crashes and fatalities occur on major arterials (streets such as Maynardville Pike and Clinton Highway).
 - 16 percent of crashes (21 crashes) occurred on major arterials.
 - Crashes on major arterials resulted in 8 fatalities, which is 47 percent of all fatalities resulting from pedestrian/bicycle crashes.
 - Since 2013, crashes on major arterials resulted in no serious injury crashes.
 - For more information on crashes along major arterials, see the Appendix.

Types of crashes analyzed in this report

This report analyzes certain crash factors. It focuses on identifying locations and behaviors where interventions – in the form of design changes, education, or enforcement – may help to prevent future crashes. 61 (45 percent) of the total crashes fit into one of these categories. Categories of crashes analyzed in this report are:

- **Drivers failing to yield while turning.** These are crashes where the report indicates that the pedestrian or bicyclist was behaving properly while traveling along or across a street, and the driver failed to yield while making a turn. These crashes suggest the need for changes to the geometry of the intersections and/or to the function of the traffic signals to prevent future crashes. Education and traffic enforcement can also help prevent these types of crashes.

- **People struck by cars while walking in locations without sidewalks.** These are crashes where the report indicates the pedestrian was walking along a street without sidewalks and was struck by a car. These crashes indicate the need for sidewalks to be installed.
- **Drivers failing to yield while going straight.** These are crashes where the report indicates that the pedestrian or cyclist was crossing the street in a legal crosswalk², either marked or unmarked, and was struck by a driver. These crashes indicate the need for better design of crossing locations, which may include reducing crossing distances and the addition of signs, beacons, or signals. Education and traffic enforcement can also help prevent this type of crash.
- **Bicyclists riding in locations without safe facilities.** These are crashes where the report indicates a bicyclist was struck from behind or while riding on the sidewalk.³ These crashes indicate the need for a safe bicycle facility along a corridor.
- **People struck by cars while crossing a street outside of an intersection or marked midblock crossing.** These are crashes where the report indicates a pedestrian was struck while crossing a street at a location other than an intersection or a marked midblock crossing. These crashes suggest the need for additional crossings, as the existing crossings may be dangerous or inconvenient. Education of pedestrians can also help prevent this type of crash.
- **Bicyclists riding in an unsafe manner or location.** These are crashes where the report indicates that the bicyclist either riding on the street against traffic, or riding at night with no lights. These crashes suggest the need better education of bicyclists.

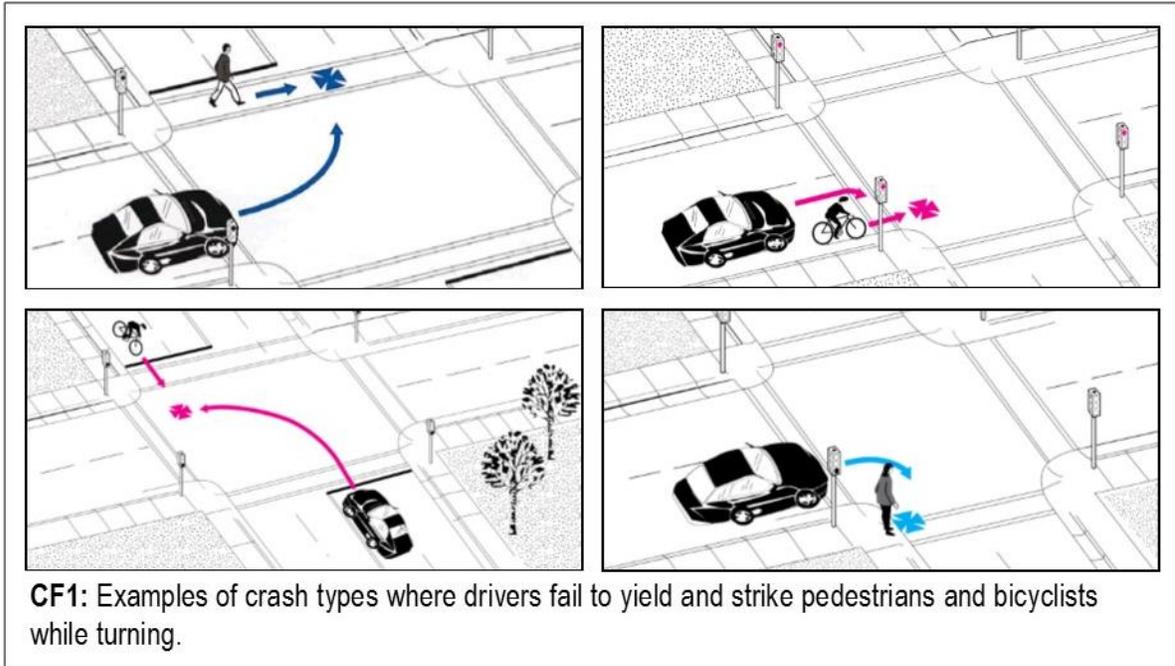
² Tennessee Code Annotated 55-8-101 (11) defines “crosswalk” as “(A) That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or, in the absence of curbs, from the edges of the traversable roadway; or (B) Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface.”

³ Riding a bicycle on the sidewalk is legal. Bicycle safety educators generally warn against it, because of the danger from turning motor vehicles.

TABLE 2: Crash Factors		Number of Crashes	Percent of Crashes*
1. Drivers failing to yield while turning (17 total crashes)	Turning left	9	15
	Turning right (not right on red)	7	11
	Turning right on red light	1	2
	Direction of turn unclear	0	0
2. Pedestrian struck while walking along corridor without sidewalks		21	34
3. Driver failing to yield while going straight		9	15
4. Bicyclist riding on sidewalk		0	0
5. Pedestrian crossing street outside of an intersection or marked crosswalk		9	15
6. Bicyclist riding against traffic		1	2
7. Driver striking bicyclist from behind		3	5
8. Bicyclist riding at night with no lights		1	2

*Percentages do not total to 100 due to rounding

Crash Factor 1: Drivers failing to yield while turning

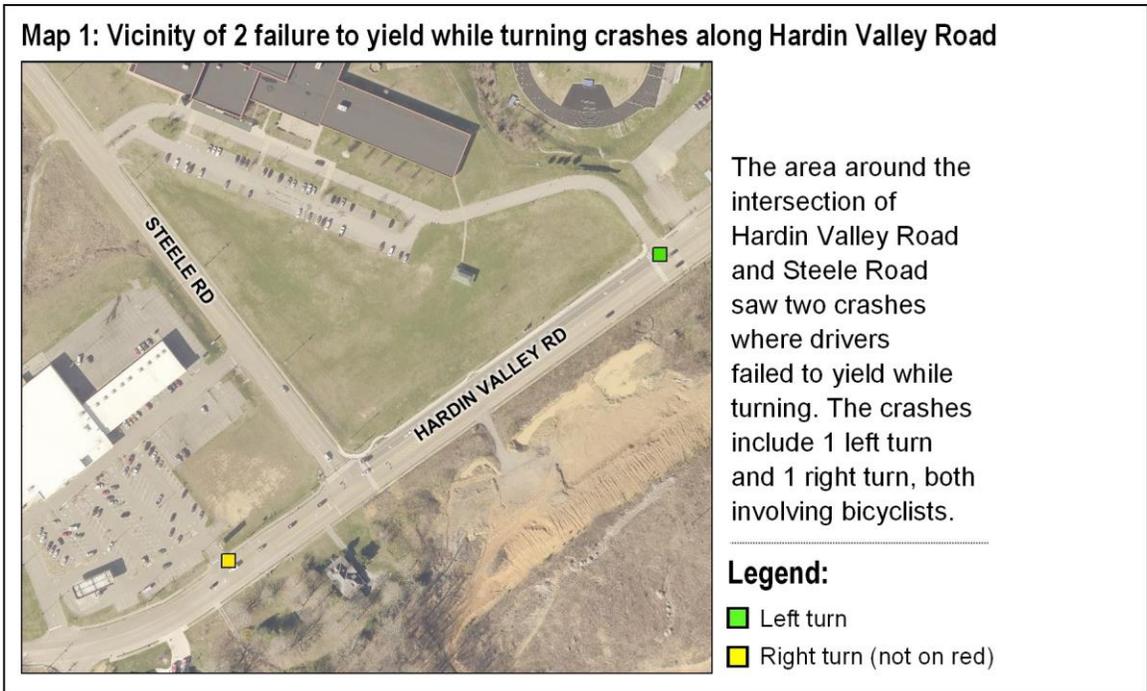


- Of the crashes where a crash factor has been identified, 17 (28 percent) involved pedestrians or bicyclists hit by cars whose drivers failed to yield properly when turning.⁴ Of these, 9 crashes involved drivers turning left; 7 involved a right turn (not on a red light); and 1 involved a right turn on red.
- 13 out of 17 of these crashes involved injuries, with no fatalities.
- 10 of these crashes involved bicyclists, and the remaining 7 involved pedestrians.
- Two corridors saw multiple crashes of this type:
 - 3 crashes along Hardin Valley Road, all involving bicyclists (see Map 1 for the location of 2 of those crashes in the same vicinity)
 - 3 crashes along Maynardville Pike, 2 involving pedestrians
- A table with more details about the locations of these crashes follows.

⁴ This crash factor is identified only where the bicyclist or pedestrian involved was traveling safely and within the law and the driver failed to yield.

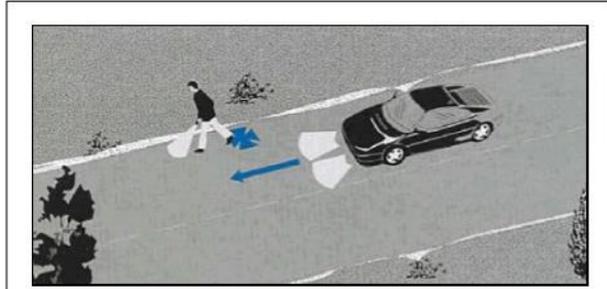
TABLE 3: Locations of failure-to-yield crashes					
Corridor	Cross street	Left turns	Right turn (not on red)	Right turn on red	Turn direction unclear
Dutchtown Rd	west of Simmons Rd	1			
E Emory Rd	east of Andersonville Pk	1			
Hardin Valley Rd	Charlevoix Rd	1			
	east of Steele Rd	1			
	west of Steele Rd		1		
Joyce LN	W Beaver Creek Dr		1		
Ledgerwood Rd	access road to Halls High School		1		
Lovell Rd	west of Schaffer Rd		1		
Maynardville Pk	Cunningham Rd		1		
	north of Cunningham Rd		1		
	Fountain Valley Dr			1	
Old Clinton Pk	south of W Emory Rd	1			
Periwinkle Rd	Umber Dr	1			
Sevierville Pk	E Norton Rd	1			
Shoreham Blvd	Newfane Cir	1			
W Emory Rd	west of Brickyard Rd		1		
Yarnell Rd	west of Lovell Rd	1			

Number in red indicates that crashes involved a bicyclist.



Crash Factor 2: People struck by cars while walking in locations without sidewalks

In 21 crashes (34 percent), a person walking along a street without a sidewalk was hit by a driver.⁵ 16 of these crashes involved injuries, and 4 involved fatalities. One corridor saw multiple crashes of this type: Bob Kirby Road (2). The locations of all crashes of this type follows:



CF2: A frequent crash type in rural & suburban areas is pedestrians being struck while walking in locations lacking sidewalks.

TABLE 4: Locations of people being struck while walking along streets without sidewalks	
Crash occurred on this street	Near the intersection with this street
Asheville Hwy	Cash Rd
Bob Kirby Rd	Thunderbolt Way
Bob Kirby Rd	Secretariat Blvd
Clinton Hwy (fatality)	Stonebridge Dr
Crosslane Rd (fatality)	Byington Solway Rd
Dante Rd	Mundal Rd
Delray Rd	Bob Gray Rd
E Emory Rd	Hallbrook Rd
Governorwood Dr (fatality)	Montmorency Dr
Greenwell Rd	Crystal Point Dr
Hill Rd	York Rd
Maynardville Pk	Old Maynardville Pk
Millertown Pk	Huday Rd
Norris Frwy (fatality)	Archibald Way
Nubbin Ridge Rd	Hampson Ln
Pelleaux Rd	Western Rd
E Raccoon Valley Dr	I-275
Robinson Rd	Dana Ln
S Carter School Rd	Mill Chase Dr
Snyder Rd	Amber Meadows Cir
Tazewell Pk	Graceland Rd

⁵ This crash factor is identified only where the crash report finds that the pedestrian was walking along the side of the road when the crash happened, not cases where pedestrians entered the road to cross.

Crash Factor 3: Driver failing to yield while going straight

In 9 crashes (15 percent), drivers were going straight and failed to yield for a person walking or bicycling across the street in a legal crosswalk, either marked or unmarked, or who otherwise has the right of way.⁶ All of these crashes involved pedestrians. 8 of the crashes involved injuries, and the remaining 1 was a fatality. 3 of these crashes occurred around schools. The locations of all crashes of this type follows:

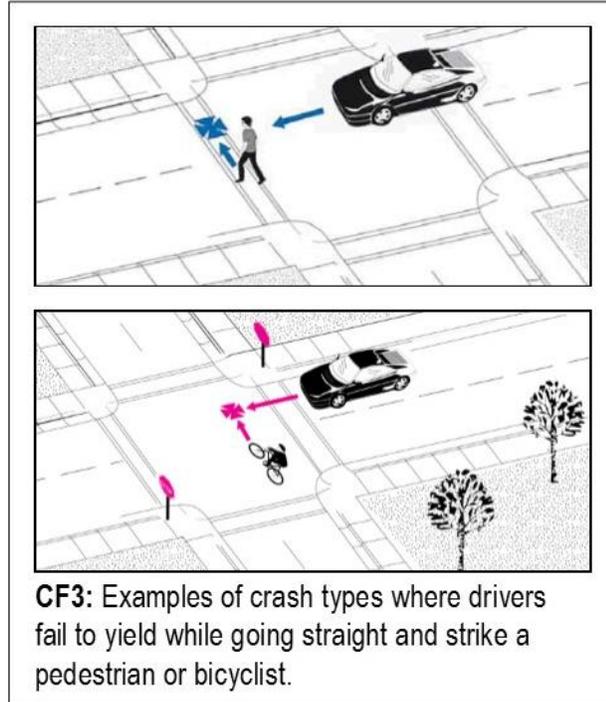


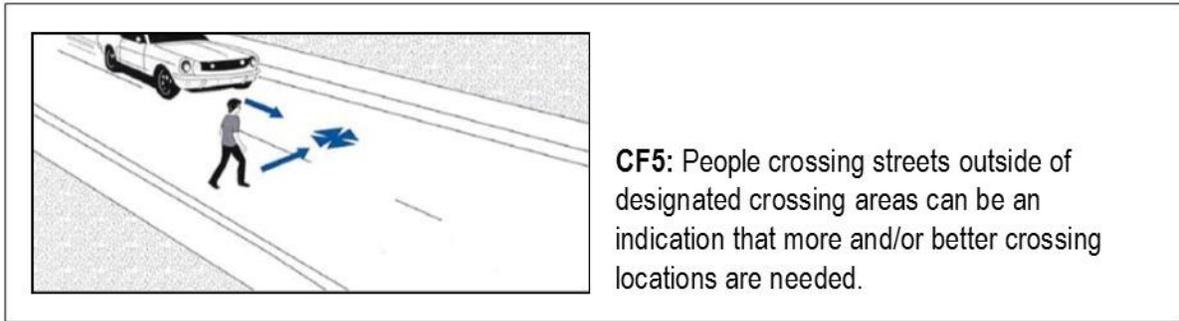
TABLE 5: Areas with pedestrians struck by drivers going straight and failing to yield	
Crash occurred on this street	In this area
Ballcamp Pk	at eastern access road to Ball Camp Elementary
Tipton Station Rd	at western access road to South-Doyle High School
Millertown Pk	at Lakin Rd
Ball Rd	at Hackberry Rd
S Northshore Dr	at Nantasket Rd
E Emory Rd (fatality)	at Ridge Creek Ln
Pedigo Rd	at Ideal Dr
Sedgewick Dr	at Penwood Dr
W Emory Rd	at western access road to Powell High School

⁶ This crash factor is not identified where the crash report finds that the person walking or bicycling entered the street in a way that failed to give the driver sufficient time to yield the right of way.

Crash Factor 4: Bicyclist riding on sidewalk

No crashes of this type were reported in unincorporated Knox County during the time analyzed in this report.

Crash Factor 5: Pedestrian crossing street outside of an intersection or marked crosswalk



In 9 crashes (15 percent), a pedestrian was crossing the street outside of an intersection or marked crosswalk. 4 of these crashes involved injuries, and 5 others were fatalities. 2 corridors saw multiple crashes of this type: Chapman Highway (3) and Clinton Highway (2). The locations of all crashes of this type follows. Map 2 shows the area along Chapman Highway where 2 fatal crashes of this type occurred.

TABLE 6: Areas with pedestrians struck while crossing outside of an intersections or marked crosswalk	
Crash occurred on this street	In this area
Bakertown Rd	east of Romulus Ln
Ball Camp Byington Rd	south of Foggy Ridge Way (fatality)
Chapman Hwy	2 crashes near W Circle Dr (both fatalities); 1 crash south of Simpson Rd
Clinton Hwy	1 crash east of Larkspur Ln; 1 crash east of Pentucket Way (both fatalities)
Mynatt Rd	west of Keithway Ln
N Cedar Bluff Rd	south of Dutchtown Rd

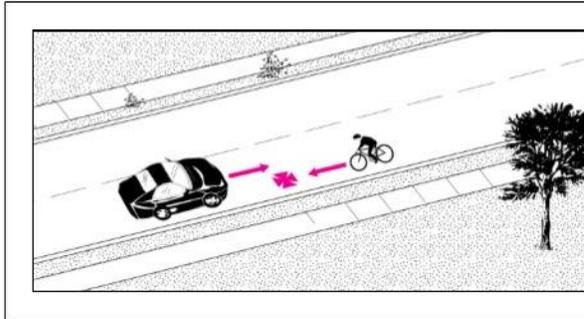
Map 2: Pedestrians crossing street outside of an intersection or marked crosswalk



Chapman Highway near the intersection with East Circle Drive and West Circle Drive saw 2 crashes where pedestrians were crossing midblock. Both crashes resulted in fatalities.

● Pedestrian crossing midblock

Crash Factor 6: Bicyclist riding against traffic

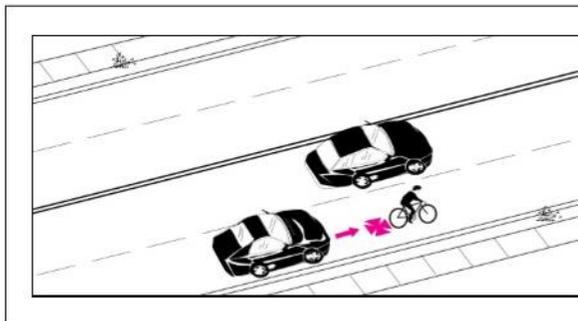


CF6: Some bicyclists ride against traffic in the mistaken belief that it's safer than riding in the same direction as other traffic.

One crash was associated with a bicyclist riding against traffic. It was an injury crash. The location was on Barnard Road near Woods Smith Road.

Crash Factor 7: Driver striking bicyclist from behind

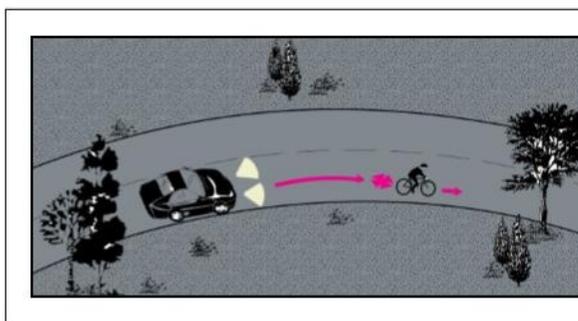
Three bicyclists were struck from behind by drivers. The crashes were scattered around the County. All 3 crashes involved injuries, with no fatalities.



CF7: Drivers striking bicyclists from behind is a relatively uncommon but very dangerous crash type, accounting for 25% of fatal bicycle crashes across the U.S.

Crash Factor 8: Bicyclist riding at night with no lights

One crash was associated with a bicyclist riding at night with no lights. It was an injury crash.



CF8: Tennessee law requires bicyclists riding after dark to use a mounted headlight and rear reflectors. A rear red light is also recommended.

Methodology

Crash data were downloaded from the TITAN database maintained by the State of Tennessee. Crashes were mapped in ArcMap GIS software based on latitude/longitude or closest intersection, where lat/long data were not available. TPO staff then reviewed the location of each crash to correct data errors. TPO staff assigned crash factors based on information obtained from individual crash reports, including crash narratives and information about citations issued.

Image credit

All crash type images are from the Pedestrian and Bicycle Crash Analysis Tool (PBCAT), which was developed by the Federal Highway Administration (FHWA), in cooperation with the National Highway Traffic Safety Administration (NHTSA). The purpose of the PBCAT is to assist with analysis of pedestrian/bicycle crashes with the goal of preventing them.

Appendix: Pedestrian/bicycle crashes on major arterials in unincorporated Knox County

As described in the full report on pedestrian/bicycle crashes in unincorporated Knox County, a disproportionate share of crashes and fatalities occur on major arterials (streets such as Maynardville Pike and Clinton Highway).

This confluence of pedestrian/bicycle crashes along major arterials happens for several reasons. Major arterials tend to be wide streets with high volumes of fast-moving traffic. High speeds make drivers less able to detect people walking and bicycling, and less able to stop quickly to avoid a collision.

Major arterials also tend to feature frequent destinations for people walking and bicycling, resulting in a concentration of walkers and bicyclists on these streets.

- Major arterials make up 1.4 percent of the surface street mileage within Knox County.
- Of the crashes where locations are certain, 16 percent (21 crashes) occurred on major arterials.
- Crashes on major arterials resulted in 8 fatalities, which is 47 percent of all fatalities resulting from pedestrian/bicycle crashes.
- Since 2013, crashes on major arterials resulted in no serious injury⁷ crashes.

The table that follows provides more data about crashes on major arterials.

APPENDIX TABLE 1: Ped/bike crashes along major arterials in unincorporated Knox County – Jan. 2011-March 2018					
Major arterial	Number of Crashes	Length of arterial (in miles)	Crashes per mile	Number of fatalities	Fatalities per mile
Chapman Hwy	4	2.8	1.4	2	0.71
Clinton Hwy	6	3.1	1.9	3	0.97
Maynardville Pk	7	7.1	1.0	1	0.14
Oak Ridge Hwy	3	9.1	0.3	2	0.22
Rutledge Pk	1	4.2	0.2	0	0

⁷ Crash reports rank the severity of crashes as either fatal, suspected serious injury, suspected minor injury, possible injury, or no injury. Suspected serious injury crashes used to be reported as “incapacitating,” and suspected minor injury were reported as “non-incapacitating.” For this report, suspected serious and incapacitating crashes are combined as “serious injury” crashes. Knox County crash reports began to include reliable information about the severity of injuries in 2013.