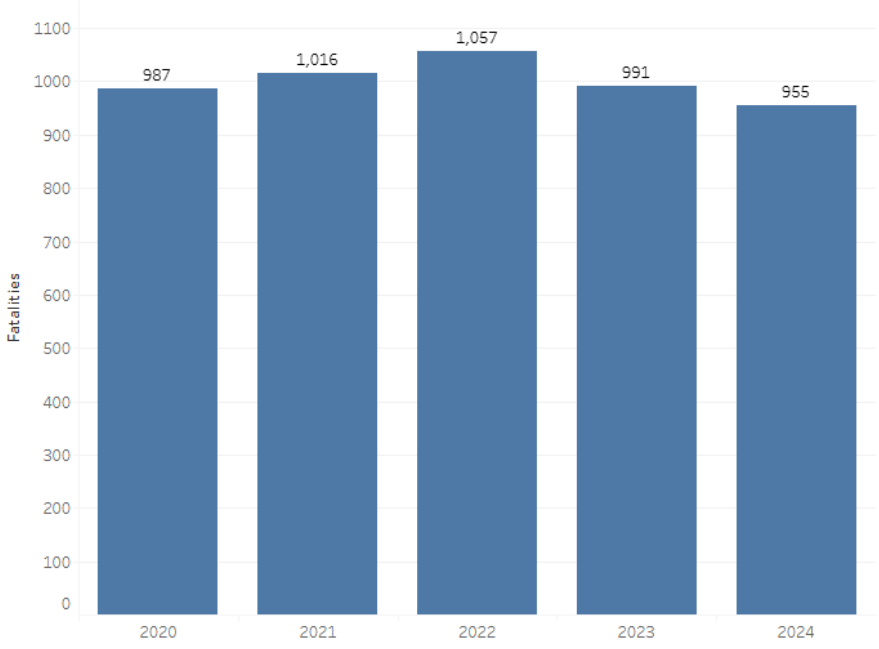
Street and Intersection Pedestrian Safety Study

City of Columbia, Missouri

June 16, 2025

The Highway Traffic Safety Problem

2020-2024 Missouri Traffic Crash Fatalities



NHTSA

10 LEADING CAUSES OF DEATH BY AGE GROUP, UNITED STATES, 2022

ALL

RANK	AGE GROUP (YEARS)										
	UNDER 1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65 & OVER	ALL AGES[1]
1	Perinatal Period 10,068	Accidental Drowning/ Submersion 458	Malignant Neoplasms 393	Suicide 493	MV Traffic Crashes (FARS) 6,753	Accidental Poisoning 22,295	Accidental Poisoning 26,767	Malignant Neoplasms 33,363	Malignant Neoplasms 105,133	Heart Disease 567,365	Heart Disease 702,880
2	Congenital Anomalies 3,970	Congenital Anomalies 441	MV Traffic Crashes (FARS) 312	MV Traffic Crashes (FARS) 462	Homicide 6,262	Suicide 8,663	Heart Disease 12,258	Heart Disease 32,298	Heart Disease 85,733	Malignant Neoplasms 452,490	Malignant Neoplasms 608,371
3	Homicide 252	Homicide 343	Congenital Anomalies 241	Malignant Neoplasms 442	Accidental Poisoning 6,205	MV Traffic Crashes (FARS) 8,104	Malignant Neoplasms 11,177	Accidental Poisoning 21,364	COVID-19 24,252	COVID-19 146,320	COVID-19 186,552
4	Heart Disease 241	MV Traffic Crashes (FARS) 285	Homicide 180	Homicide 366	Suicide 6,040	Homicide 6,712	Suicide 8,185	COVID-19 9,678	Accidental Poisoning 19,334	Stroke 142,513	Stroke 165,393
5	Influenza Pneumonia 154	Malignant Neoplasms 266	Accidental Drowning/ Submersion 119	Congenital Anomalies 205	Malignant Neoplasms 1,421	Heart Disease 3,789	MV Traffic Crashes (FARS) 6,702	Chronic Liver Disease/ Cirrhosis 9,401	Diabetes Mellitus 17,410	Chronic Lower Respiratory Disease 125,803	Chronic Lower Respiratory Disease 147,382
6	COVID-19 141	Influenza Pneumonia 129	Accidental Exp. Smoke/Fire/ Flames 102	Heart Disease 145	Heart Disease 848	Malignant Neoplasms 3,641	Chronic Liver Disease/ Cirrhosis 5,501	Suicide 7,781	Chronic Lower Respiratory Disease 17,138	Alzheimer's Disease 118,525	Alzheimer's Disease 120,122
7	Septicemia 123	Heart Disease 103	Influenza Pneumonia 77	Accidental Drowning/ Submersion 103	Accidental Drowning/ Submersion 454	Chronic Liver Disease/ Cirrhosis 1,786	Homicide 4,765	Diabetes Mellitus 7,364	Chronic Liver Disease/ Cirrhosis 16,484	Diabetes Mellitus 71,985	Accidental Poisoning 102,958
8	Stroke 87	COVID-19 101	Heart Disease 73	Accidental Poisoning 88	COVID-19 447	COVID-19 1,640	COVID-19 3,841	MV Traffic Crashes (FARS) 5,688	Stroke 14,173	Nephritis/ Nephrosis 47,086	Diabetes Mellitus 101,209
9	MV Traffic Crashes (FARS) 70	Accidental Exp. Smoke/Fire/ Flames 85	COVID-19 62	COVID-19 69	Congenital Anomalies 412	Diabetes Mellitus 1,188	Diabetes Mellitus 2,879	Stroke 5,563	Suicide 7,864	Accidental Falls 40,919	Nephritis/ Nephrosis 57,937
10	Meningitis 43	Accidental Poisoning 75	Chronic Lower Respiratory Disease 48	MV Other/ Non-Traffic Crashes 62	Diabetes Mellitus 324	Stroke 599	Stroke 2,150	Chronic Lower Respiratory Disease 2,987	Nephritis/ Nephrosis 6,668	Parkinson's Disease 38,931	Chronic Liver Disease/ Cirrhosis 54,803

The Pedestrian Safety Problem

National

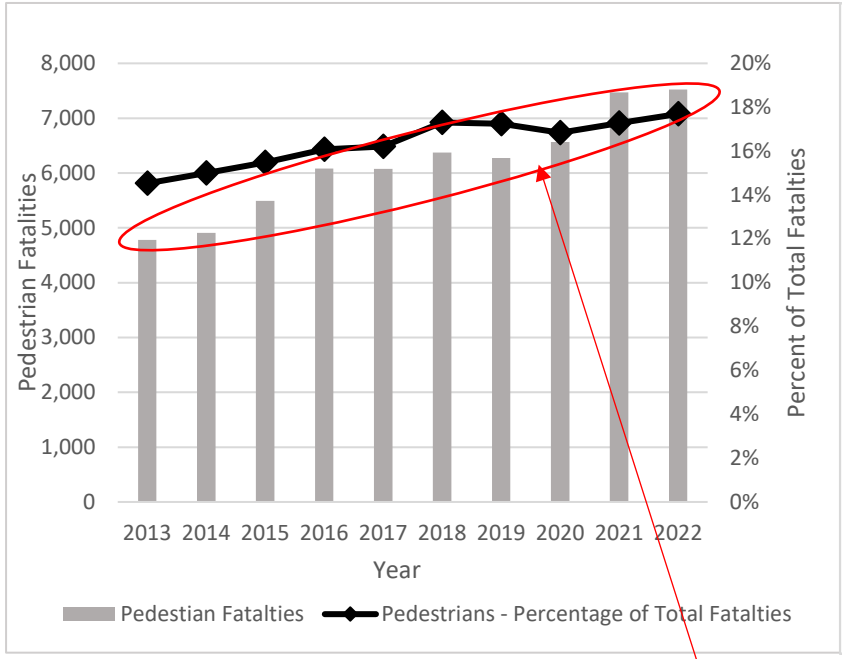
- ~67,400 pedestrians injured/ 7,522 killed in 2022.
- 18% of US Highway Fatalities are Pedestrians.
- 78% of Pedestrian Fatalities occur during dark conditions.

Missouri

- 1,189 pedestrians injured/ 128 killed in 2022.
- 12% of Missouri Highway Fatalities are Pedestrians.
- 85% of Pedestrian Fatalities occur during dark conditions.

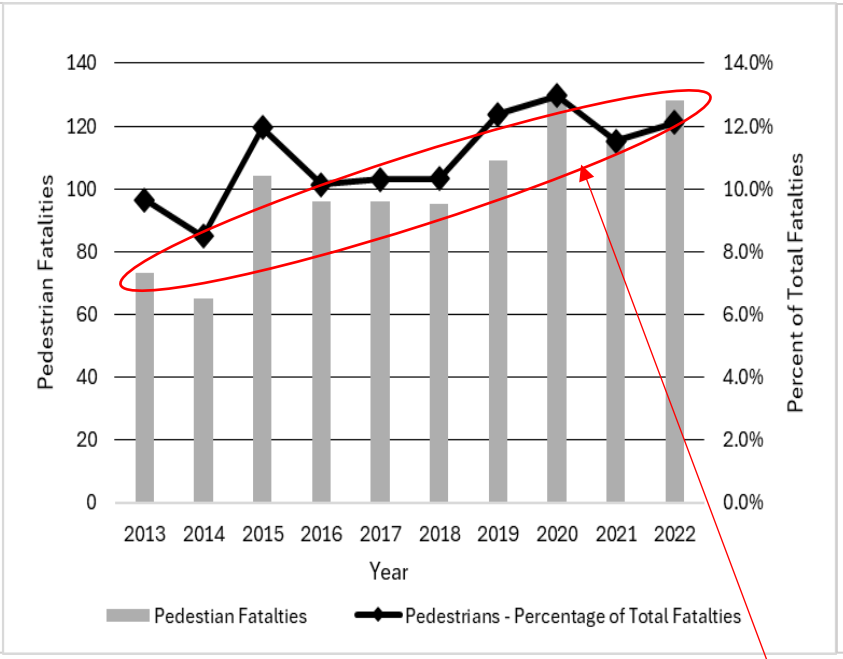
City of Columbia

- 2.6% of Missouri's pedestrian fatalities occur in Columbia (2019-2023).
- 32% of the fatal crashes in Columbia were pedestrians (2019-2023).
- 88% of Pedestrian Fatalities occur during dark conditions (2019-2023)



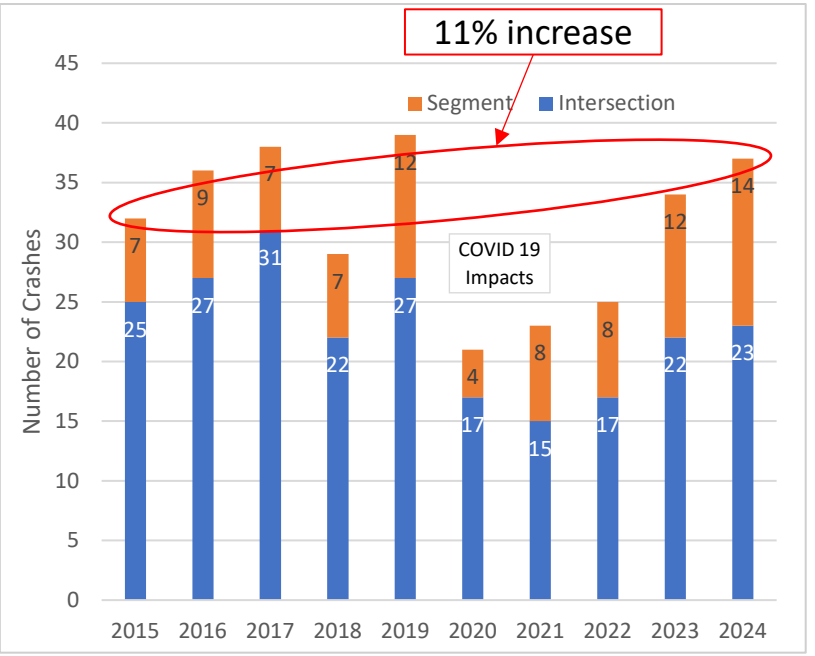
Fatal crashes involving pedestrians in the U.S. (2013-2022)

58% increase



Fatal crashes involving pedestrians in Missouri (2013-2022)

75% increase



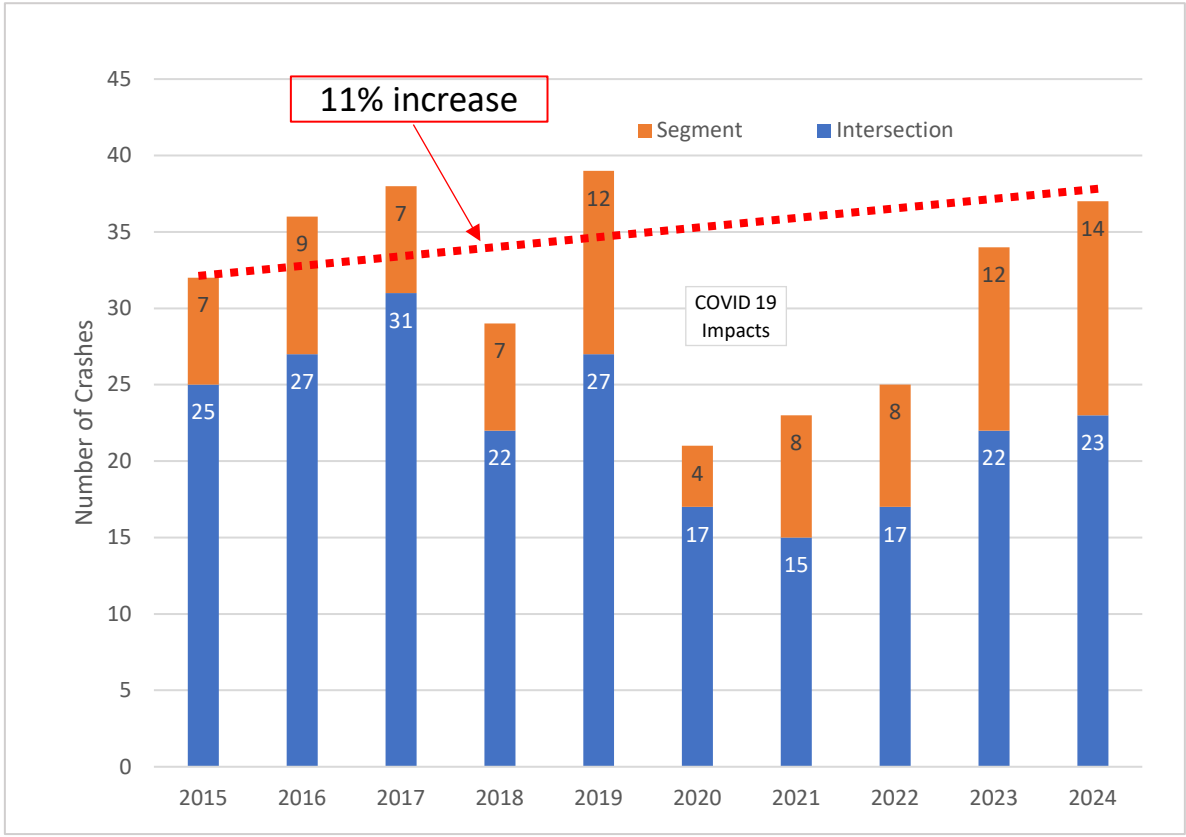
Crashes involving pedestrians in the City of Columbia (2015-2024)

The Pedestrian Safety Problem in Columbia

- 2.6% of Missouri's pedestrian fatalities occur in Columbia (2019-2023).
- 32% of the fatal crashes in Columbia were pedestrians (2019-2023).
- 88% of Pedestrian Fatalities occur during dark conditions (2019-2023).
- Overall, 93.6% of pedestrian crashes resulted in an injury or fatality.
- Overall, 72% of pedestrian crashes occurred at intersections.
- Overall, 30% of pedestrian crashes at intersections had medians.

Rank	Number of Pedestrian Involved Crashes	Presence of Medians	Location
1	12	Medians	College Avenue and University Avenue
2	6	Medians	College Avenue and Rollins Street
3	5	No Medians	Stadium Boulevard and Monk Drive/Champions Drive
4	4	Medians	Business Loop 70 and Providence Road (MO163)
5	3	Medians	Stadium Boulevard and Worley Street
	3	Medians	E. Broadway and Waugh Street
	3	No Medians	Hospital Drive and Hitt Street
	3	No Medians	S. Providence Road and E. Stewart Road
	3	No Medians	Rollins Street and Virginia Avenue
	3	No Medians	Hospital Drive and Monk Drive
	3	No Medians	E. Broadway and 9th Street
	3	No Medians	E. Broadway and 10th Street
	3	No Medians	Trimble Road and Brickton Road
	3	No Medians	S. Providence Road and Locust Street
	3	No Medians	University Avenue and Matthews Street

Top Intersections with Pedestrian Involved Crashes (2015-2024)



Crashes involving pedestrians in the City of Columbia (2015-2024)

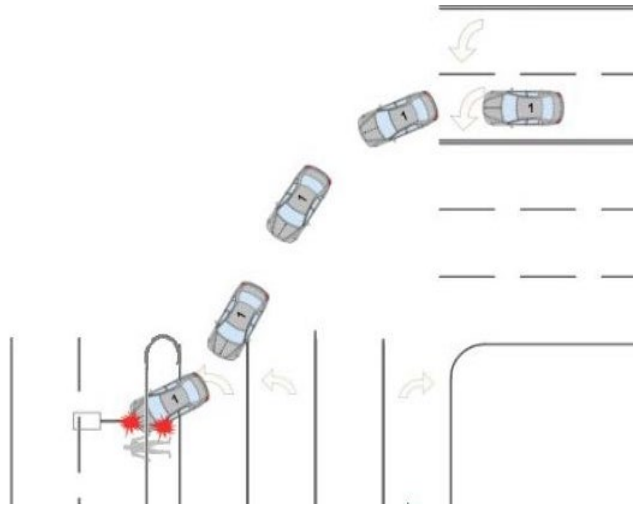
Injury Crashes: Pedestrians in Medians (2015-2024)

- Stadium & Worley (3)
- Stadium & Broadway
- Business Loop & Rangeline
- US 63 Connector & Clark Lane
- Stadium & I-70
- Business Loop & Providence
- College & Broadway

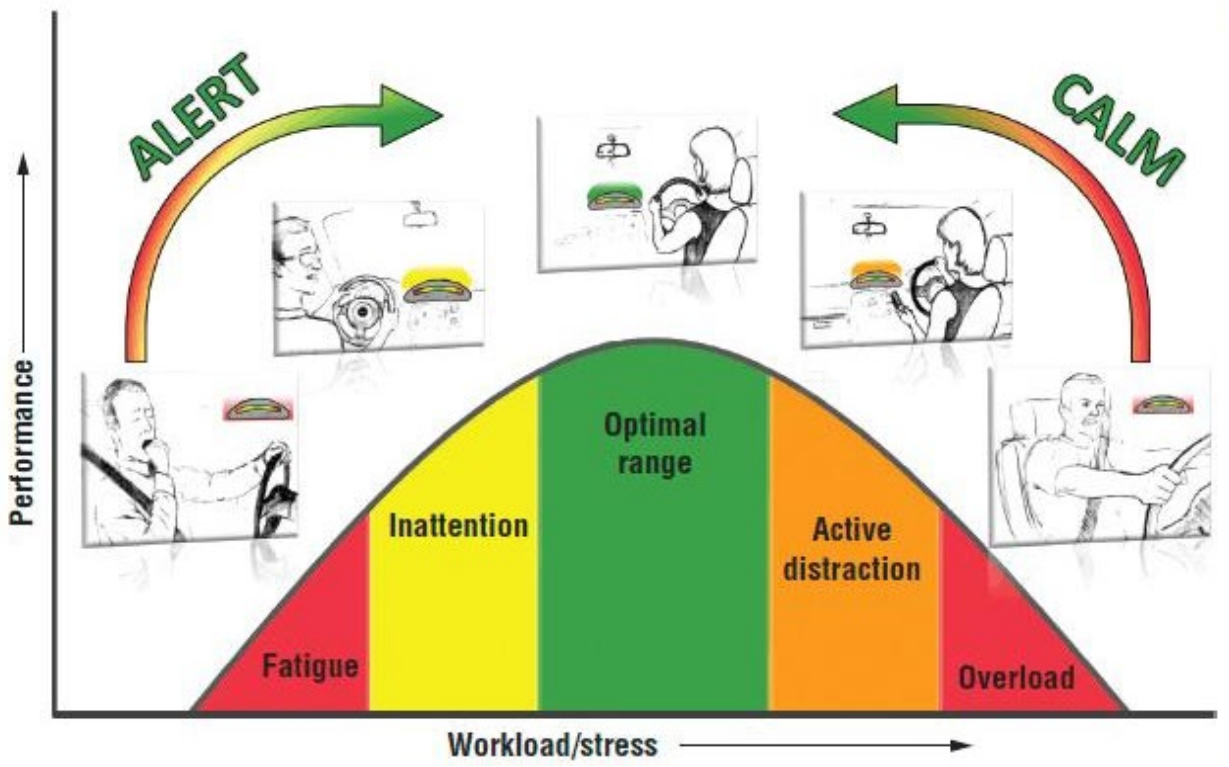
OFFICER STATEMENT:

The crash occurred when vehicle one was traveling Northbound on North Stadium Boulevard and was attempting to make a left hand turn to travel West on West Worley Street. Vehicle one turned short and began traveling in the eastbound land of West Worley. Driver one then tried to correct her lane of travel by turning vehicle one to the right to enter the westbound lane of travel on West Worley. Vehicle one then traveled over the raised concrete curb style median. As vehicle one traveled over the concrete median it struck a street sign with its front bumper.

Vehicle one also struck pedestrian one with the driver's side of the vehicle which caused its driver's side mirror to fold in. Pedestrian one was walking west on West Worley in the median when he was struck by vehicle one. Initially pedestrian one's injuries appeared to be minor and he did not want medical attention. However, pedestrian one was convinced to be taken to the hospital for his injuries after he was unable to balance or walk on his own without assistance. Pedestrian one was transported via ambulance to the hospital where he was treated for a brain injury and a broken hip.



Pedestrians in Unexpected Context: Expectancy



Yerkes-Dodson Law of performance and stress

Injury Crashes: Pedestrians in Unexpected Context

OFFICER NARRATIVE

VEHICLE 1 WAS IN LANE 1 OF EASTBOUND BROADWAY AT THE INTERSECTION OF BROADWAY AND COLLEGE AVE. VEHICLE 2 WAS IN LANE 2 OF EASTBOUND BROADWAY AT THE INTERSECTION OF BROADWAY AND COLLEGE AVE. VEHICLES 1 AND 2 GOT THE GREEN LIGHT AND BEGAN TO TRAVEL INTO THE INTERSECTION OF BROADWAY AND COLLEGE AVE WHEN VEHICLE 1 BEGAN TO SHIFT INTO LANE 2 OF EASTBOUND BROADWAY. VEHICLE 1 COLLIDED WITH VEHICLE 2 AND CONTINUED DRIFTING RIGHT INTO LANE 1 OF SOUTHBOUND COLLEGE AVE. VEHICLE 2 WAS SPUN AROUND AND ENDED UP IN LANE 1 OF EASTBOUND BROADWAY FACING SOUTH.

DRIVER STATEMENTS

V1 - I WAS TRAVELING EASTBOUND IN LANE 1 OF EASTBOUND BROADWAY, AND LOOKED TO THE LEFT AT A HOMELESS MAN WHO WAS ON THE MEDIAN ACTING UP. VEHICLE 1 STATED THAT THEN THERE WAS SUDDENLY A PRIUS IN FRONT OF ME, I AM NOT SURE WHAT HAPPENED AS I WAS NOT LOOKING AND I DID NOT FEEL THE COLLISION.

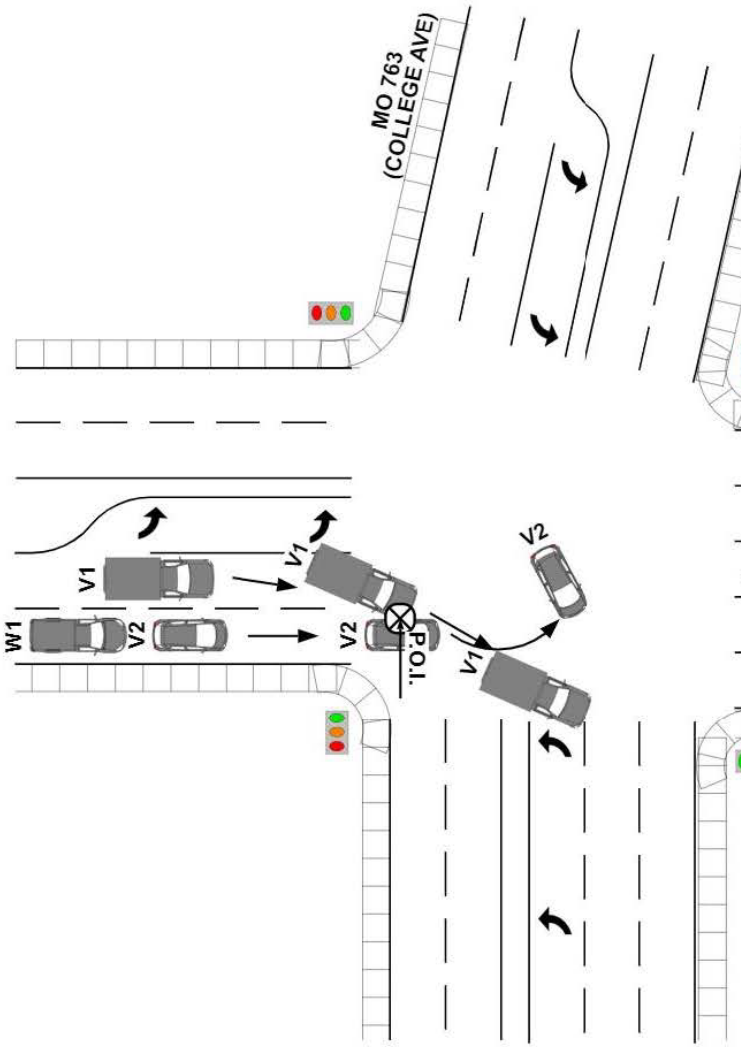
V2 - I WAS TRAVELING EASTBOUND IN LANE 2 OF EASTBOUND BROADWAY WHEN I WAS SUDDENLY STRUCK ON TH DRIVER'S SIDE BY ANOTHER VEHICLE.

WITNESS STATEMENTS

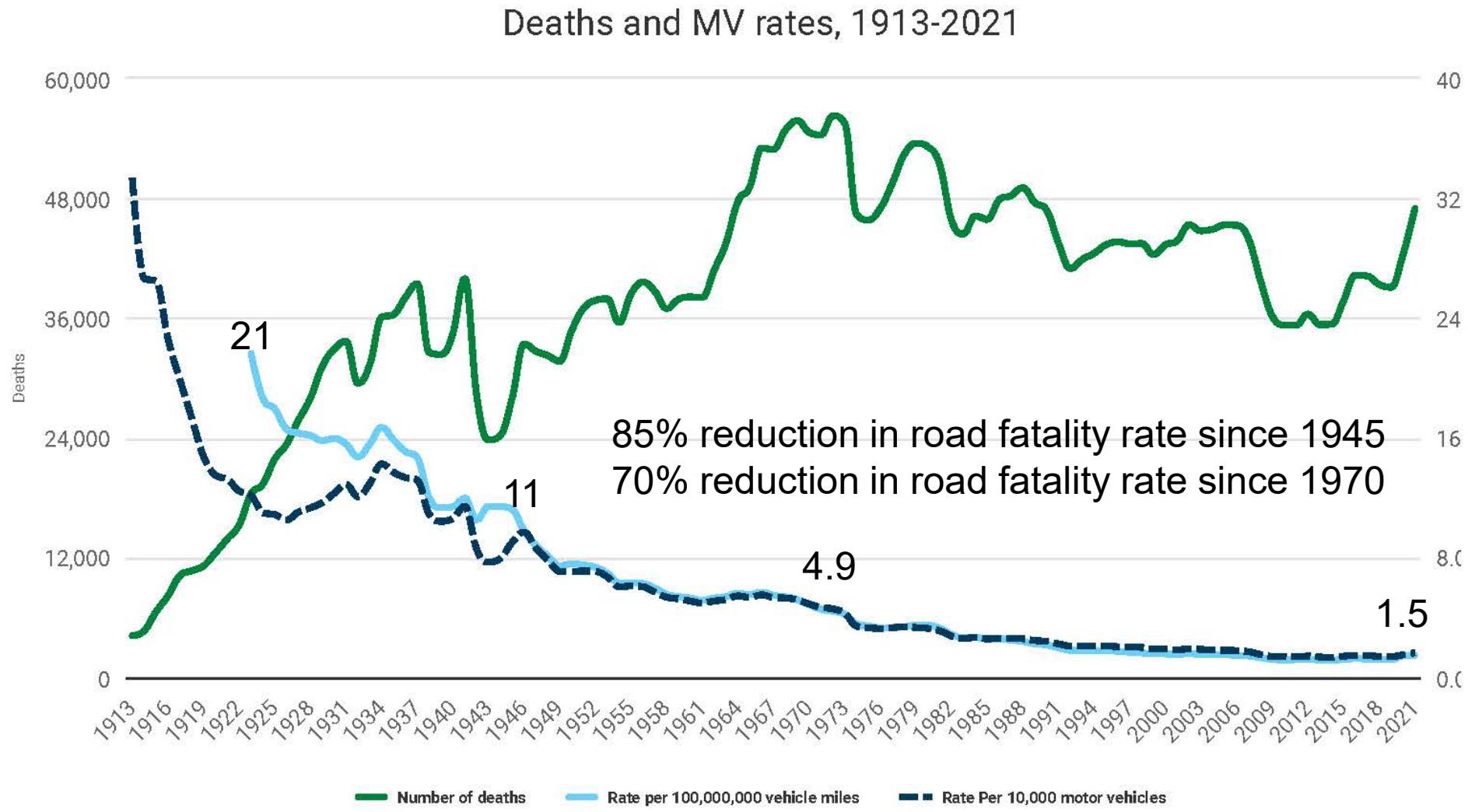
W1 - I WAS TRAVELING EASTBOUND IN LANE 2 OF EASTBOUND BROADWAY BEHIND VEHICLE 2 WHEN I SAW VEHIC 1 START TURNING RIGHT FROM LANE 1 OF EASTBOUND BROADWAY. VEHICLE 1 STRUCK THE SIDE OF VEHICLE 2, CAUSING IT TO SPIN AROUND IN THE INTERSECTION.

MISC INFORMATION

THE PASSENGER OF VEHICLE 2 ENDED UP BEING TRANSPORTED VIA AMBULANCE AND HOSPITALIZED FROM THE COLLISION. THE INJURIES INCLUDED ABDOMINAL INFLAMATION, FREE FLUID IN ABDOMINAL REGION AS WELL AS HIGH FEVER AND HIGH HEART RATE.

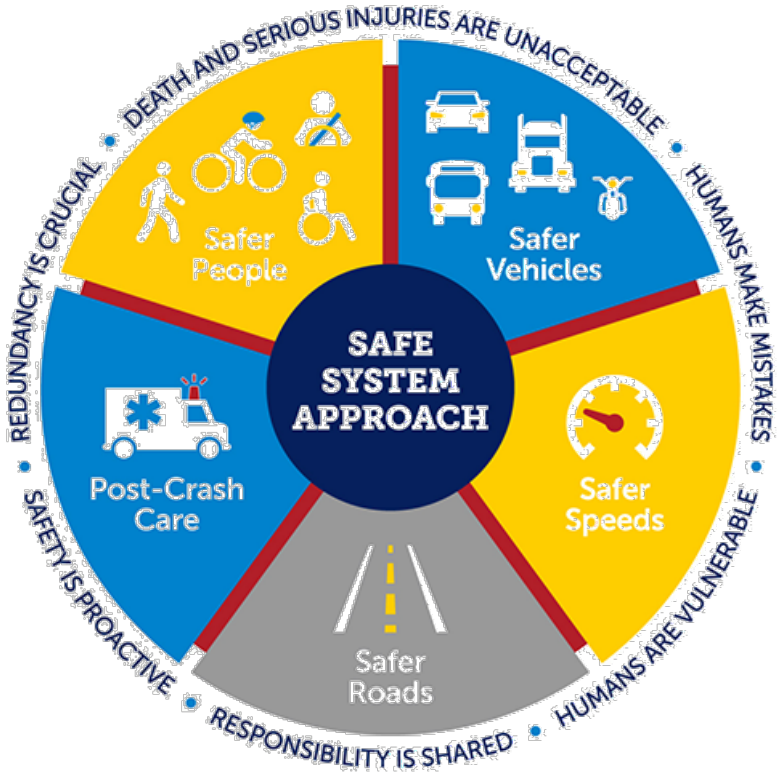


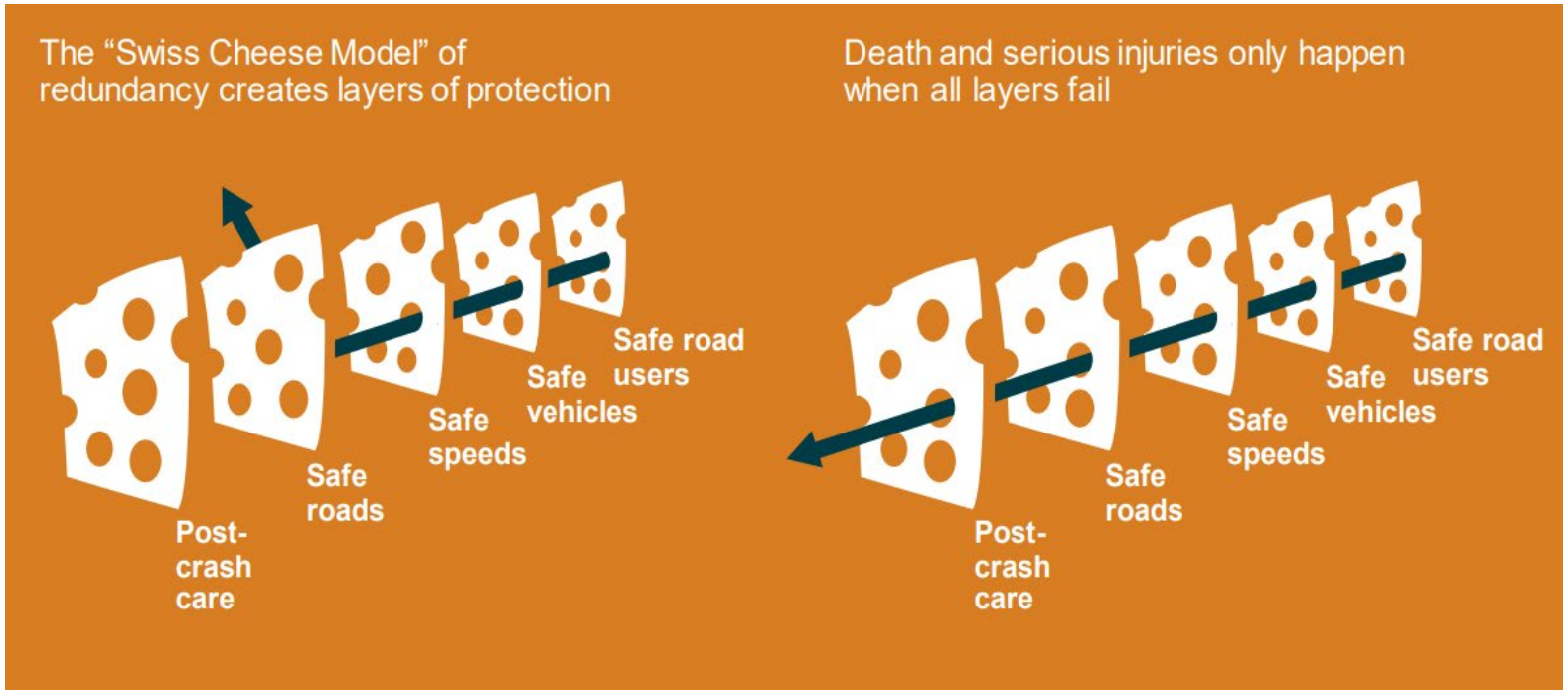
Moving the Needle



https://injuryfacts.nsc.org/motor-vehicle/historical-fatality-trends/deaths-and-rates/

Safe System Approach

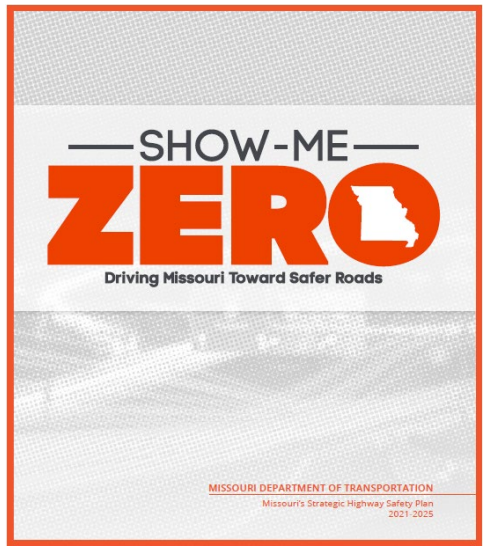




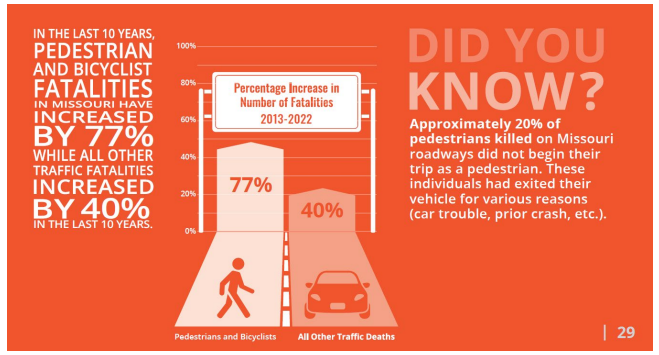
Efforts to Address Pedestrian Safety

Missouri's Strategic Highway Safety Plan: Show Me Zero – Driving Missouri Towards Safer Roads

A plan to reduce fatalities and serious injuries on Missouri roads.



Focus Group: Pedestrian and Non-Motorized Users.

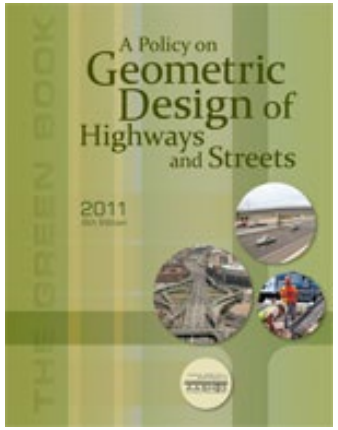


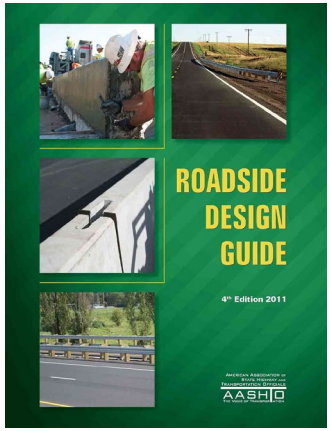
- **Organizations with Pedestrian Safety Initiatives**
  - Federal Highway Administration (FHWA)
  - Vision Zero Network
  - National Highway Traffic Administration (NHTSA)
  - Federal Motor Carrier Safety Administration (FMCSA)
  - National Safety Council (NSC)
  - Center for Disease Control and Prevention (CDC)
  - Missouri Coalition for Roadway Safety
  - Missouri Bicycle and Pedestrian Federation
  - International Federation of Pedestrians

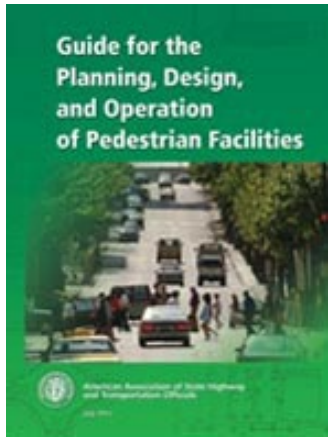
NHTSA National Highway Traffic Safety Administration
FMCSA Federal Motor Carrier Safety Administration
Missouri Bicycle & Pedestrian Federation
International Federation of Pedestrians
CDC Centers for Disease Control and Prevention
National Safety Council
VISION ZERO NETWORK
U.S. Department of Transportation Federal Highway Administration
Missouri Coalition for Roadway Safety

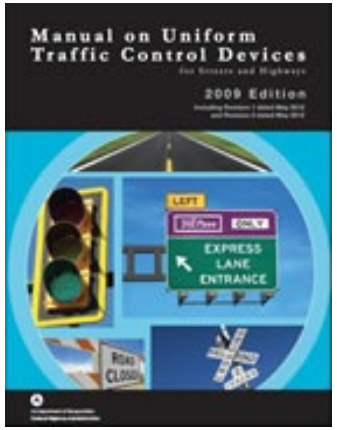
Standards and Guidelines

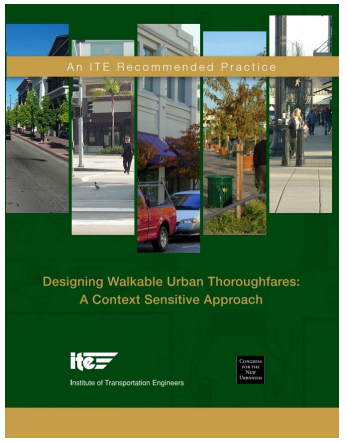
- **Many Standard Design Resources**
  - A Policy on Geometric Design of Highways and Streets (AASHTO Green Book)
  - Roadside Design Guide (AASHTO)
  - Guide for the Planning, Design, and Operation of Pedestrian Facilities (AASHTO)
  - Manual on Uniform Traffic Control Devices (MUTCD – FHWA)
  - Americans with Disabilities Act (ADA)
  - Designing Walkable Urban Thoroughfare: A Context Sensitive Approach (ITE)
  - Urban Street Design Guide (NACTO)
- **Consistency in Design**
  - Clarity in the use of pedestrian facilities (help pedestrians know where they should be).
  - Set clear expectations for drivers (help drivers know where they should expect to encounter pedestrians).











Columbia Pedestrian Safety Programs

- City follows national design standards and guidelines.
- Permits required for events when pedestrians will be located outside of typical pedestrian facilities.
- Vision Zero (launched 2017)
- Neighborhood Traffic Management Program

S College Ave between Wilson Ave & Rosemary Ln (HAWK)

Scott Blvd South of Abbington Terrace (RRFB)

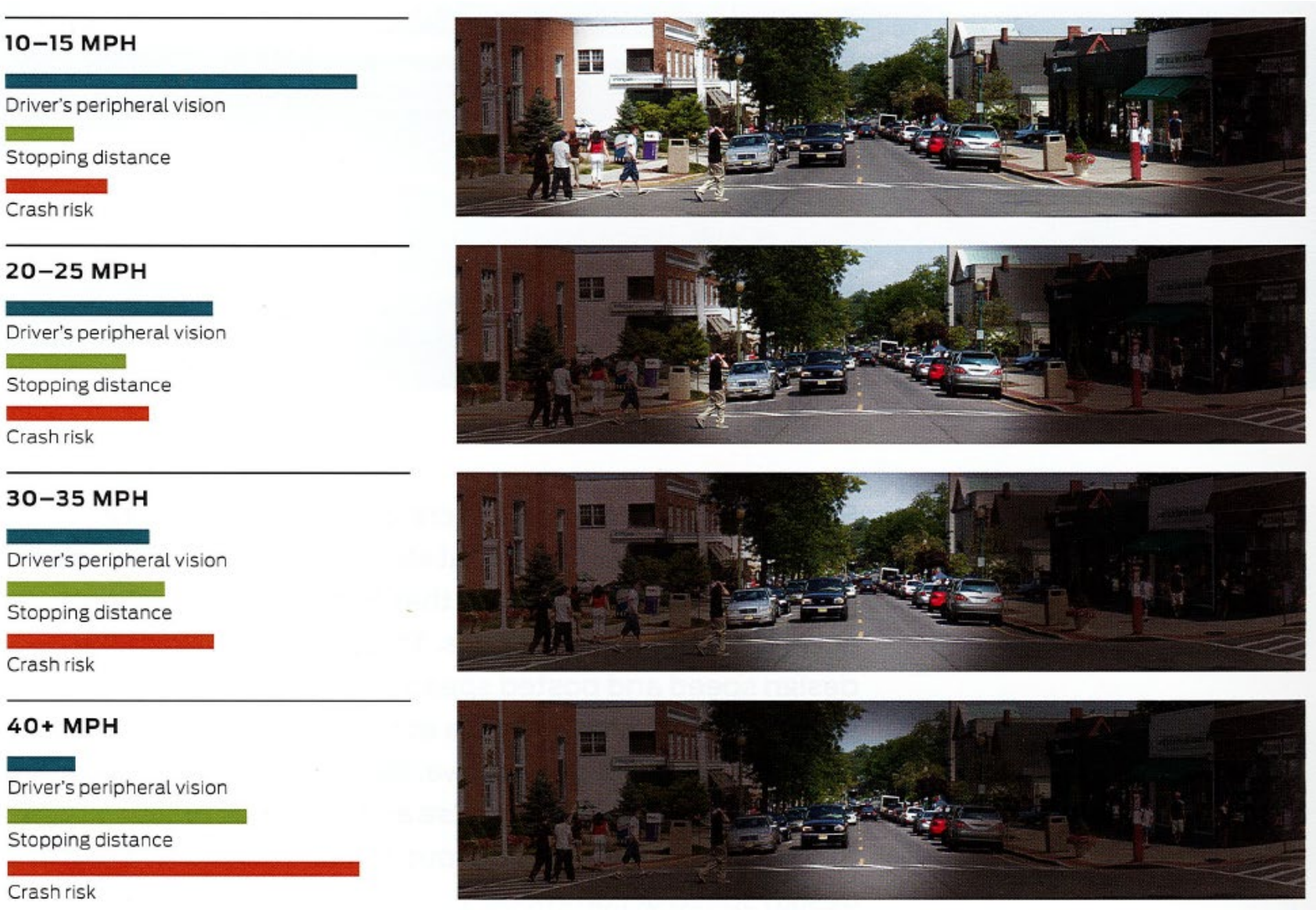
Foundational Recommendation

- To facilitate safety for pedestrians and motorists alike, pedestrians should **only be allowed in the roadway when**:
  - They **remain in designated pedestrian areas** where motorists reasonably expect them to be located (e.g., sidewalks and crosswalks); or
  - There is **temporary traffic control set up** to warn drivers that pedestrians will be present (e.g., maintenance or special events); or
  - Using particular roadways that sustain low traffic volumes and low speeds and are **designated as shared spaces** for both motorists and pedestrians; or
  - They **use temporary pedestrian refuge** as a necessary part of the process of crossing a road. (Someone who cannot get through in one traffic cycle).

Hierarchy of Concern

- Conditions that contribute to pedestrian risk.
- Primary contributory risk factors:
  1. Traffic Speed,
  2. Traffic Volume, and
  3. Median Width.

Hierarchy of Concern - Speed



Levels of driver peripheral vision, stopping distance, and crash risk with higher speeds

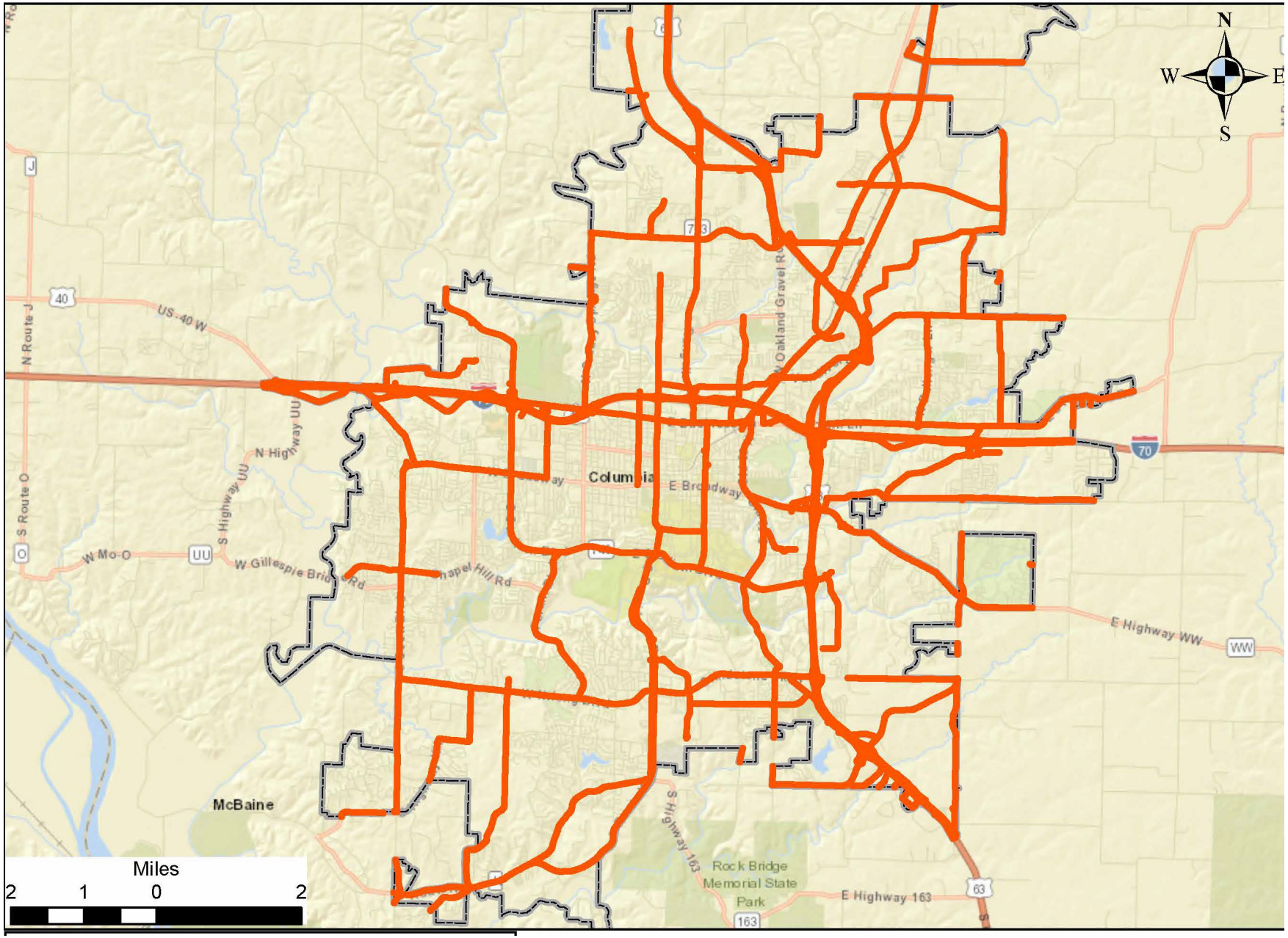
Hierarchy of Concern - Speed

Pedestrian survival rate by speed

Speed Limit 35MPH +

Columbia, Missouri

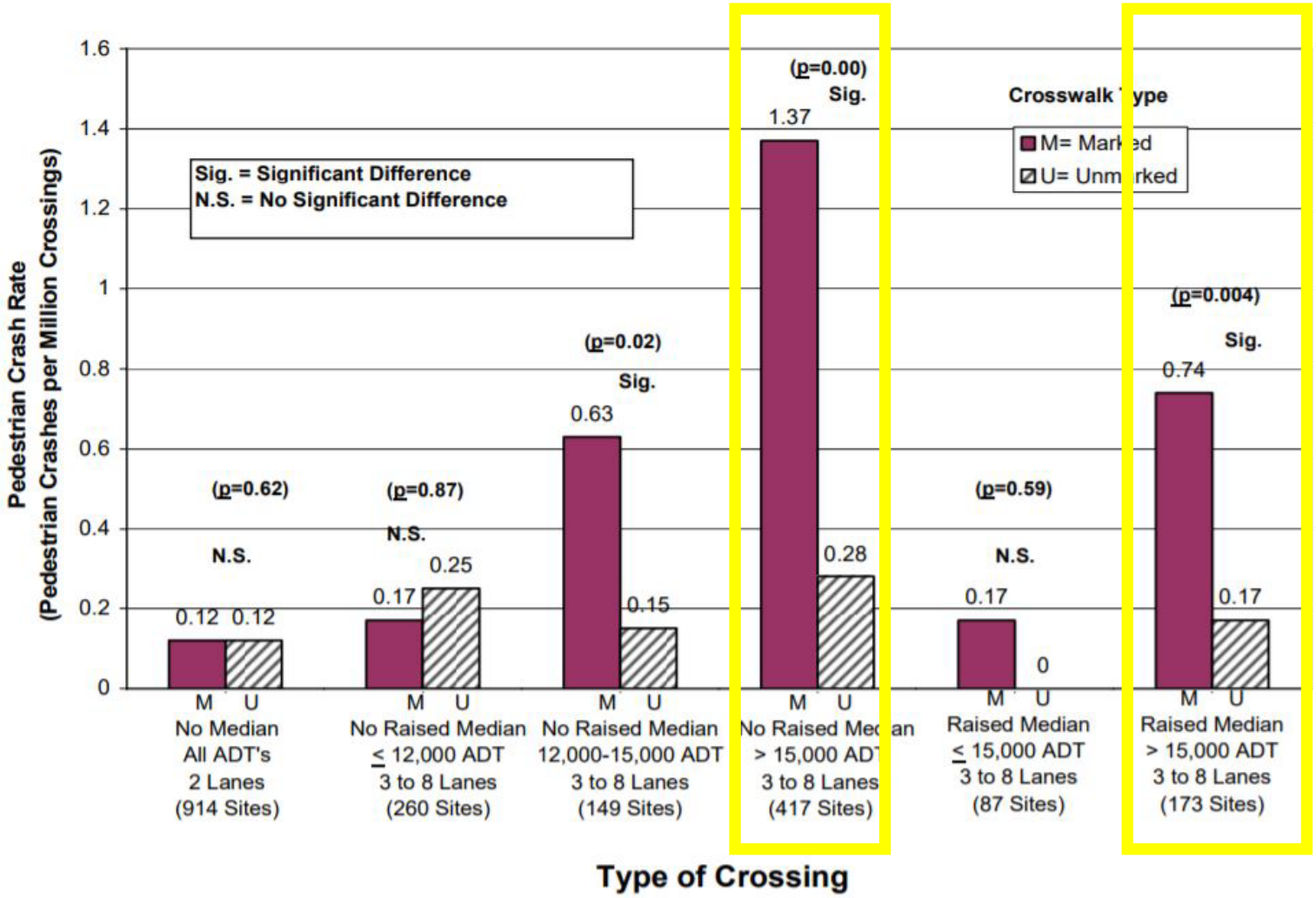
Roadways with Speed Limit of 35 mph or higher



Hierarchy of Concern - Volume

Volume and Exposure

- Pedestrian crash frequency increases with volume.
- 15,000 VPD threshold

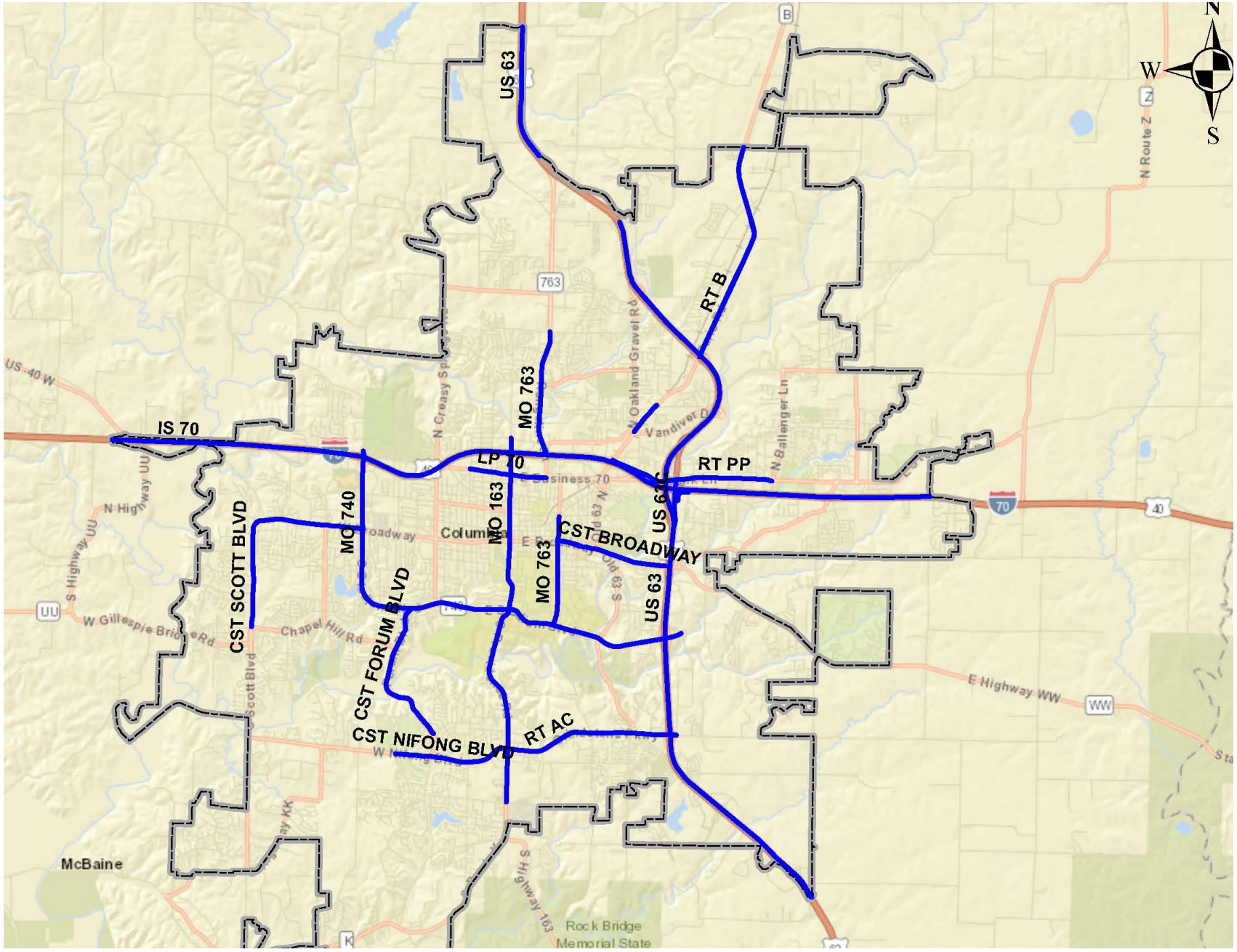


FHWA Study - Evaluation of Pedestrian Facilities

Volume
ADT 15,000

Columbia, Missouri

Roads with Average Daily Traffic (ADT) of 15,000 vehicles per day or higher



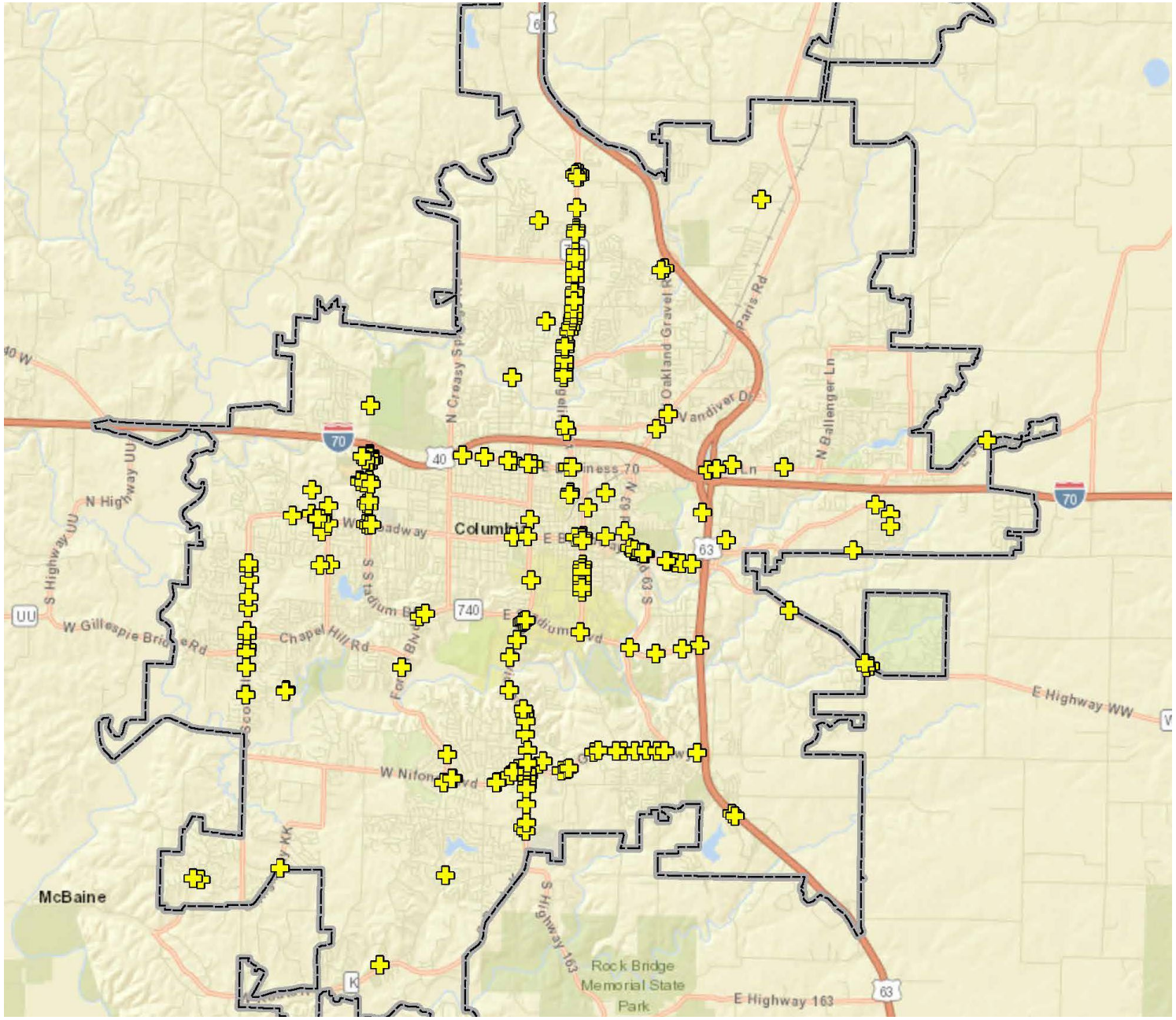
Hierarchy of Concern – Median Width

Lateral Offset

- A minimum of 1.5 feet should be clear from the face of the curb with 3 feet at intersections. (Roadside Design Guide)
- 6-Foot is the minimum protected median width.
  - AASHTO Green Book
  - AASHTO Guide to the Planning, Design, and Operation of Pedestrian Facilities
  - NACTO Urban Street Design Guide

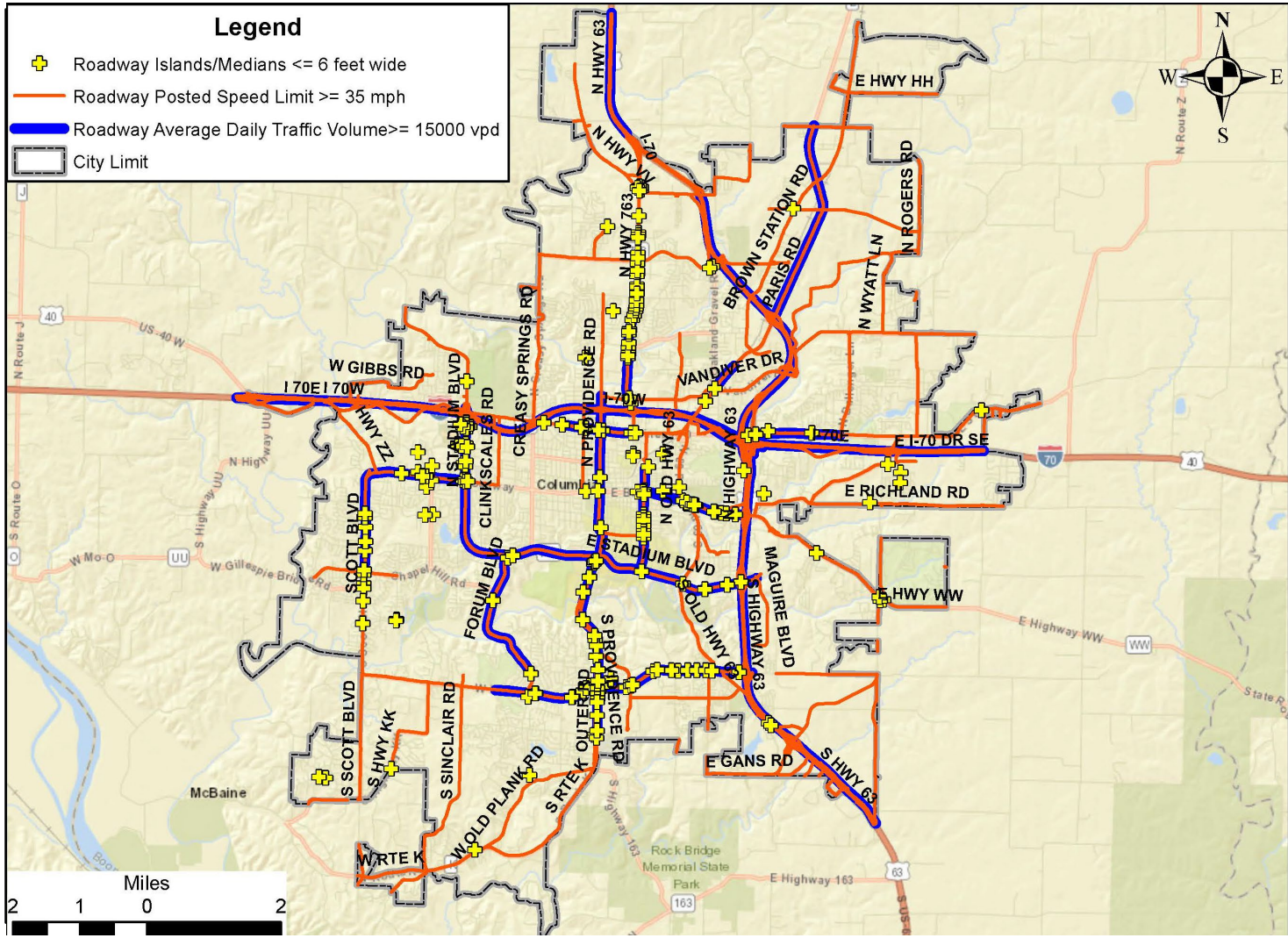
~4 ft Median at Business Loop and Providence

Median Width less than 6 Feet



Specific Recommendations

- To enhance pedestrian and motorist safety in Columbia, regulate the use of medians, roadway crossings, and islands for pedestrians at intersections with any of the following characteristics:
  - Speeds on at least one approach of 35 mph or greater, or
  - Average daily traffic volumes on one roadway of 15,000 vehicles per day or greater, or
  - Median widths less than 6-foot wide are present.



Example Peer Cities with Median Ordinances

Peer Cities with Median Ordinances

Springfield, Missouri	35 mph, 15,000 vpd, or less than 6'
Sioux Falls, South Dakota	Roads 30 mph or greater and less than 6'
Abilene Texas	Specific Locations
Bismarck, North Dakota	All Medians
San Angelo, Texas	Any Median in City

§ 80.009 PEDESTRIAN SAFETY, USE OF MEDIANS.

(a) The city council makes the following findings and adopts the following statement of purposes of this section:

(1) Pedestrian fatalities increased in the United States by 66% from 2011 to 2021 according to the National Highway Traffic Safety Administration.

(2) According to the AAA Foundation for Traffic Safety (2011), the average risk of severe injury for a pedestrian struck by a vehicle reaches 50% at 31 mph and 75% at 39 mph.

(3) A driver traveling at 30 mph who hits a pedestrian has a 45% chance of killing or seriously injuring the individual according to the US Department of Transportation Federal Highway Administration (2021).

(4) The National Association of City Transportation Officials Urban Street Design Guide (2013) states that a median or island should be at least six feet wide where pedestrians are present.

(b) For any intersection listed herein, where the speed limit is 30 miles per hour or higher and lacks pedestrian facilities; and the width of the top surface of the median is less than six feet wide excluding the curb, pedestrians are prohibited from standing, sitting, or staying on a median for any purpose. While not an exhaustive list, this section prohibits, at a minimum, pedestrians from standing, sitting, or staying on a median at the following intersections in the city:

(1) Marion Rd. at I-90.

(2) Cliff Ave. at I-90.

(3) Veterans Pkwy. at I-90.

(4) Rice St. and Veterans Pkwy.

(5) Benson Rd. at I-29.

(6) Maple St. at I-29.

(7) Algonquin St. and Minnesota Ave.

(8) Russell St. and Westport Ave.

(9) Russell St. and Western Ave.

(10) Russell St. and Prairie Ave.

(11) Rice St. at I-229.

(12) Madison St. at I-29.

(13) Madison St. and Veterans Pkwy.

(14) 12th St. at I-29.

(15) 10th St. at I-229.

(16) 26th St. at I-29.

(c) The previous section does not apply to:

(1) Public safety employees while performing their official duties.

(2) Employees or contractors for the city or state or other individuals authorized by the said entities to perform construction or maintenance work on streets or rights-of-way, while performing construction or maintenance work on the street provided that proper street signage is used and streets are blocked off as required by the city.

(3) Any individual responding to an emergency in the street.

(Ord. 19-24, passed 3-5-2024)

Sioux Falls, South Dakota Ordinance