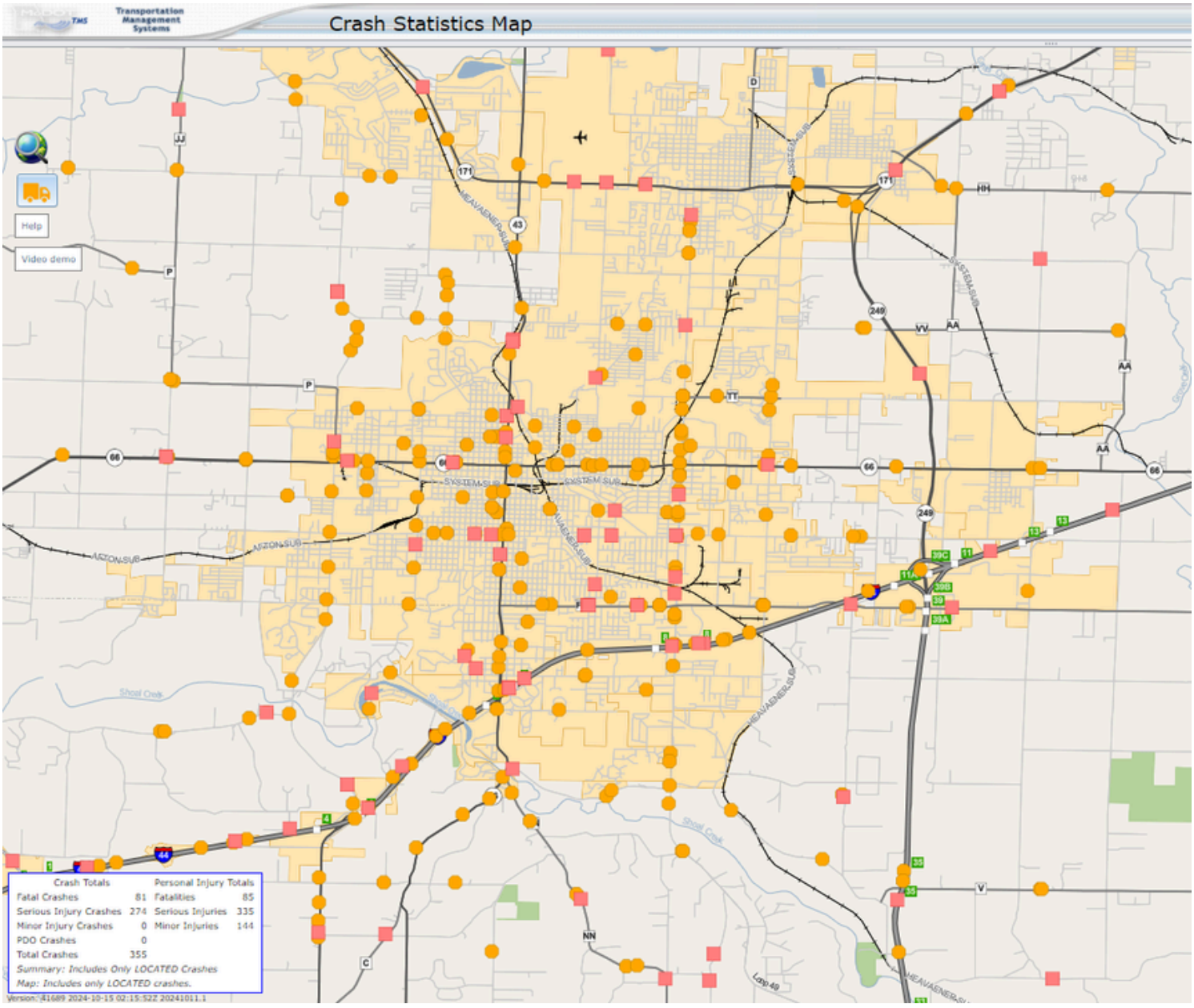
JOPLIN AREA
Transportation Study Organization

JATSO SS4A
Safety Action Plan
Appendices by Chapter

JOPLIN AREA
Transportation Study Organization

JATSO KSI CRASHES

2019-2023



Source: MoDOT

Fatal
Serious Injury

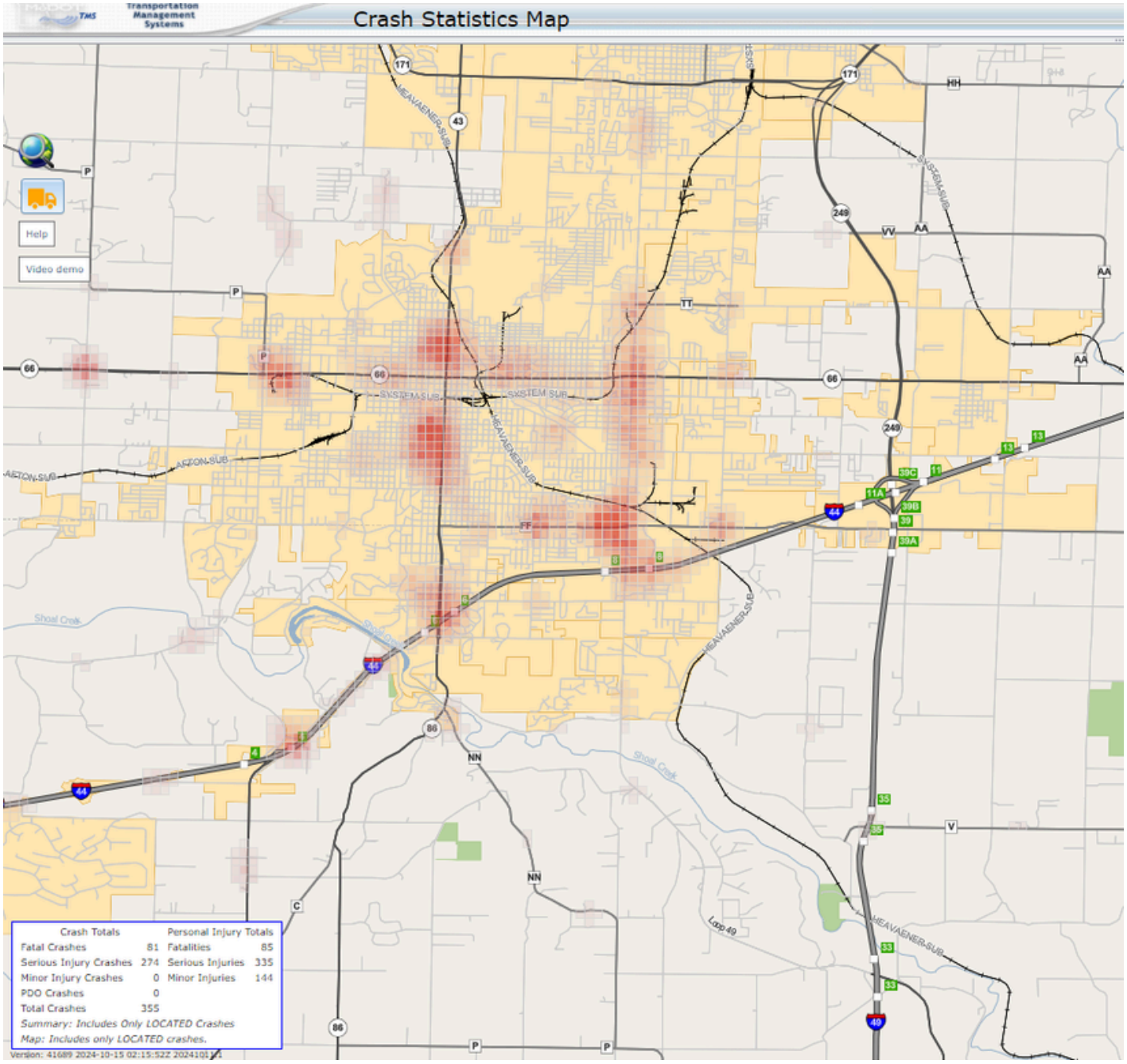
Fatality Count	5-Year Average Fatality Rate (Per 100,000 Persons)
NHTSA Count of motor-vehicle-involved roadway fatalities from 2017 to 2021 *Example:* **217 fatalities**	NHTSA Average annual motor vehicle-involved roadway fatalities from 2017 to 2021 ÷ Census Total jurisdiction population × 100,000 Persons *Example:* 217 fatalities ÷ 5 years = 43.4 avg fatalities 43.4 avg fatalities ÷ 1,255,296 population = 0.0000346 0.0000346 per capita × 100,000 = **3.46 fatalities per 100,000 persons**

JATSO 5-Year Average Fatality Rate (2019-23)
(85/5)/102,900 X 100K= **16.52 fatalities per 100K persons.**

JOPLIN AREA
Transportation Study Organization

JATSO KSI CRASHES HEAT MAP

2019-2023

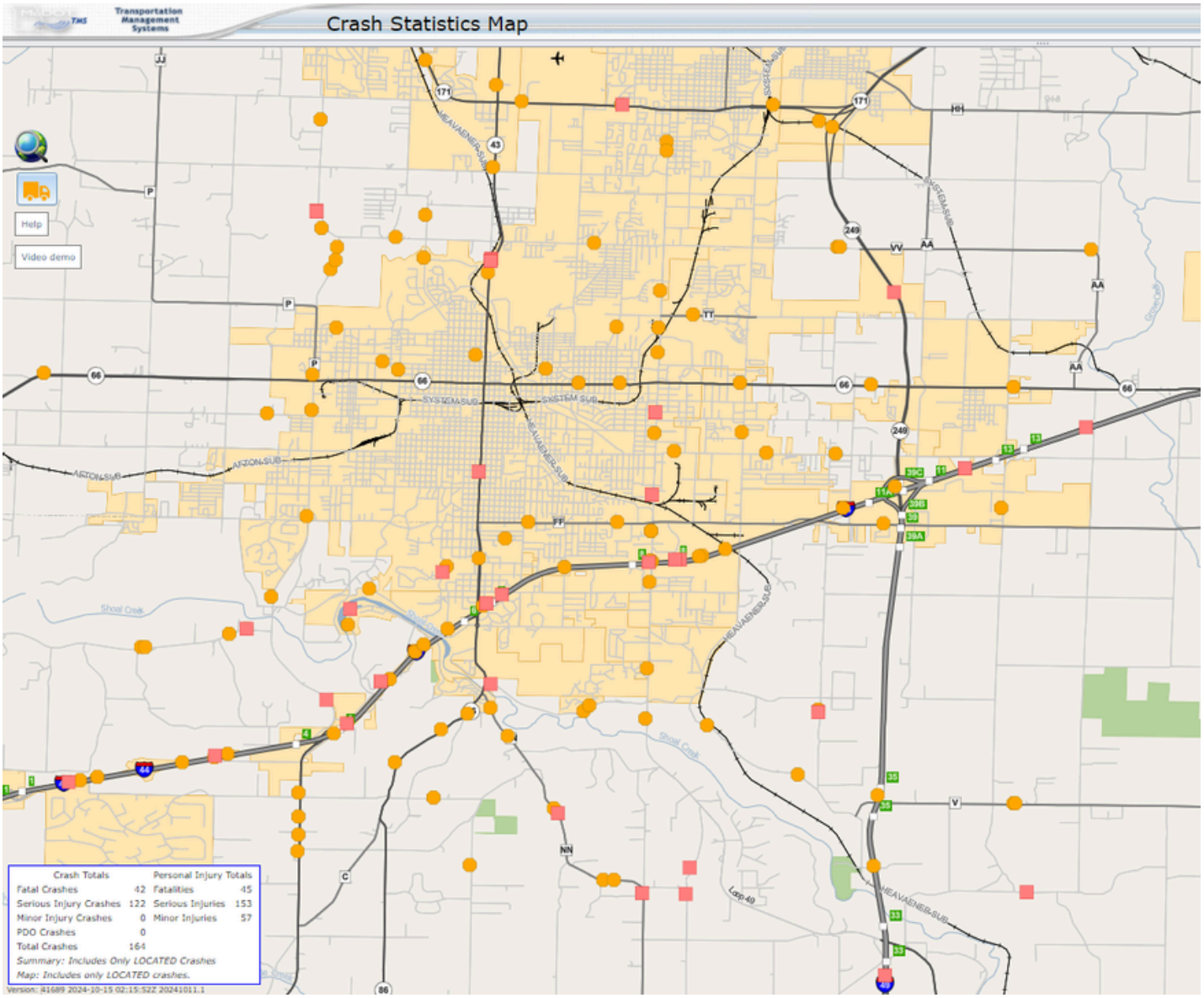


Source: MoDOT

JOPLIN AREA
Transportation Study Organization

JATSO KSI SEGMENT CRASHES

2019-2023



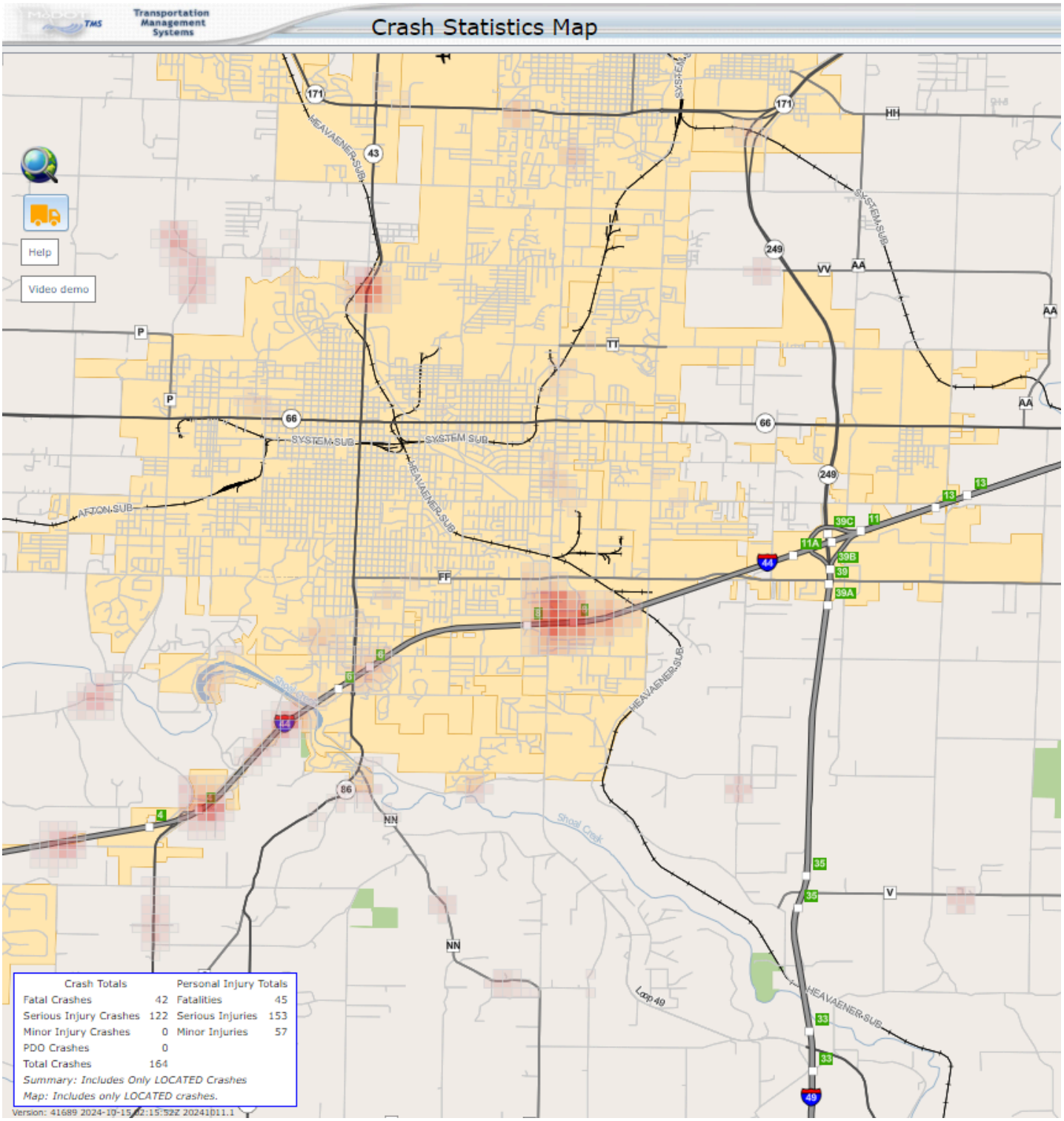
Source: MoDOT

Fatal
Serious Injury

JOPLIN AREA
Transportation Study Organization

JATSO KSI SEGMENT CRASHES HEAT MAP

2019 - 2023

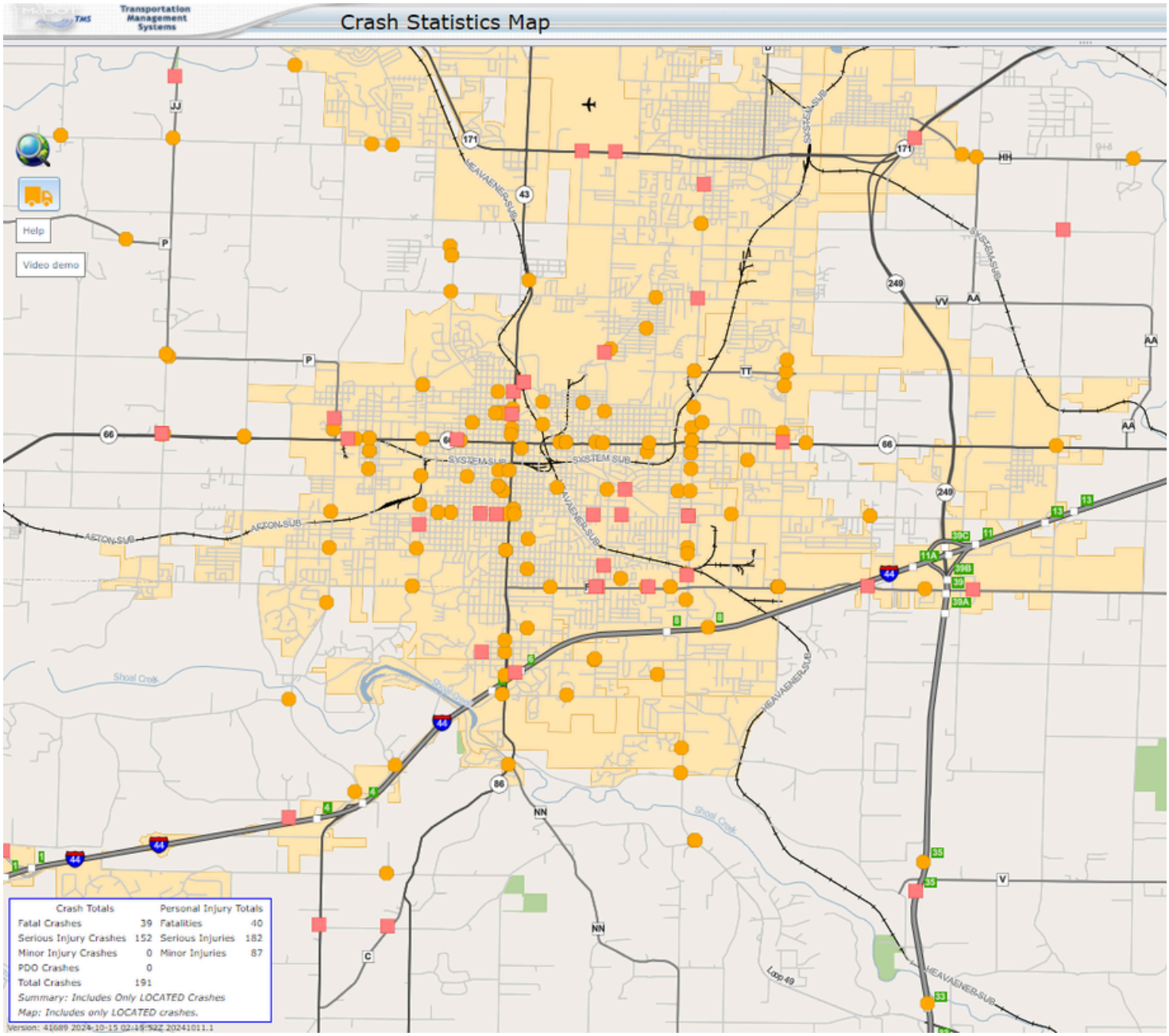


Source: MoDOT

JOPLIN AREA
Transportation Study Organization

JATSO KSI INTERSECTION CRASHES

2019 - 2023



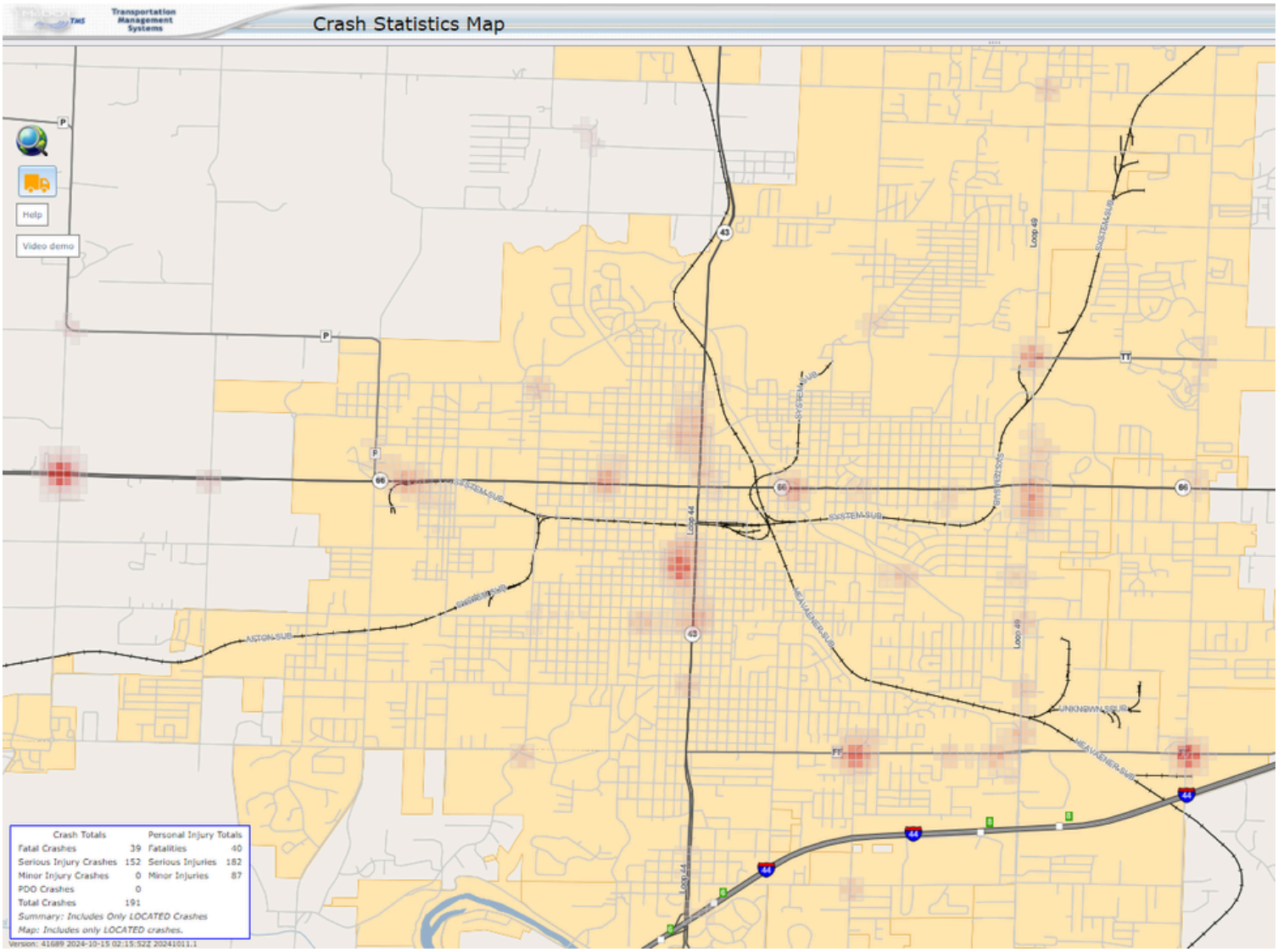
Source: MoDOT

Fatal
Serious Injury

JOPLIN AREA
Transportation Study Organization

JATSO INTERSECTION CRASHES HEAT MAP

2019 - 2023

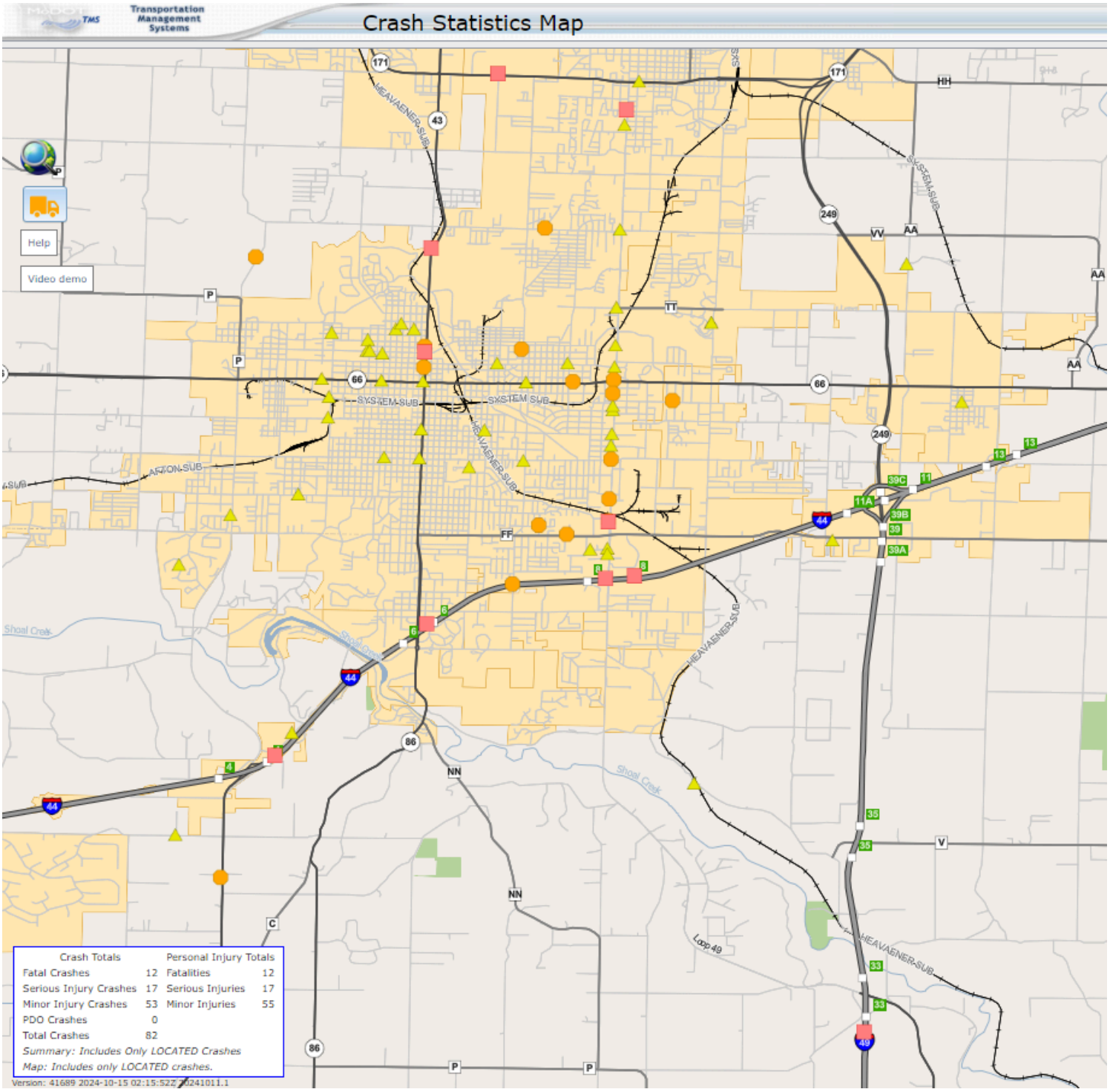


Source: MoDOT

JOPLIN AREA
Transportation Study Organization

JATSO ALL PEDESTRIAN INJURY CRASHES

2019-2023

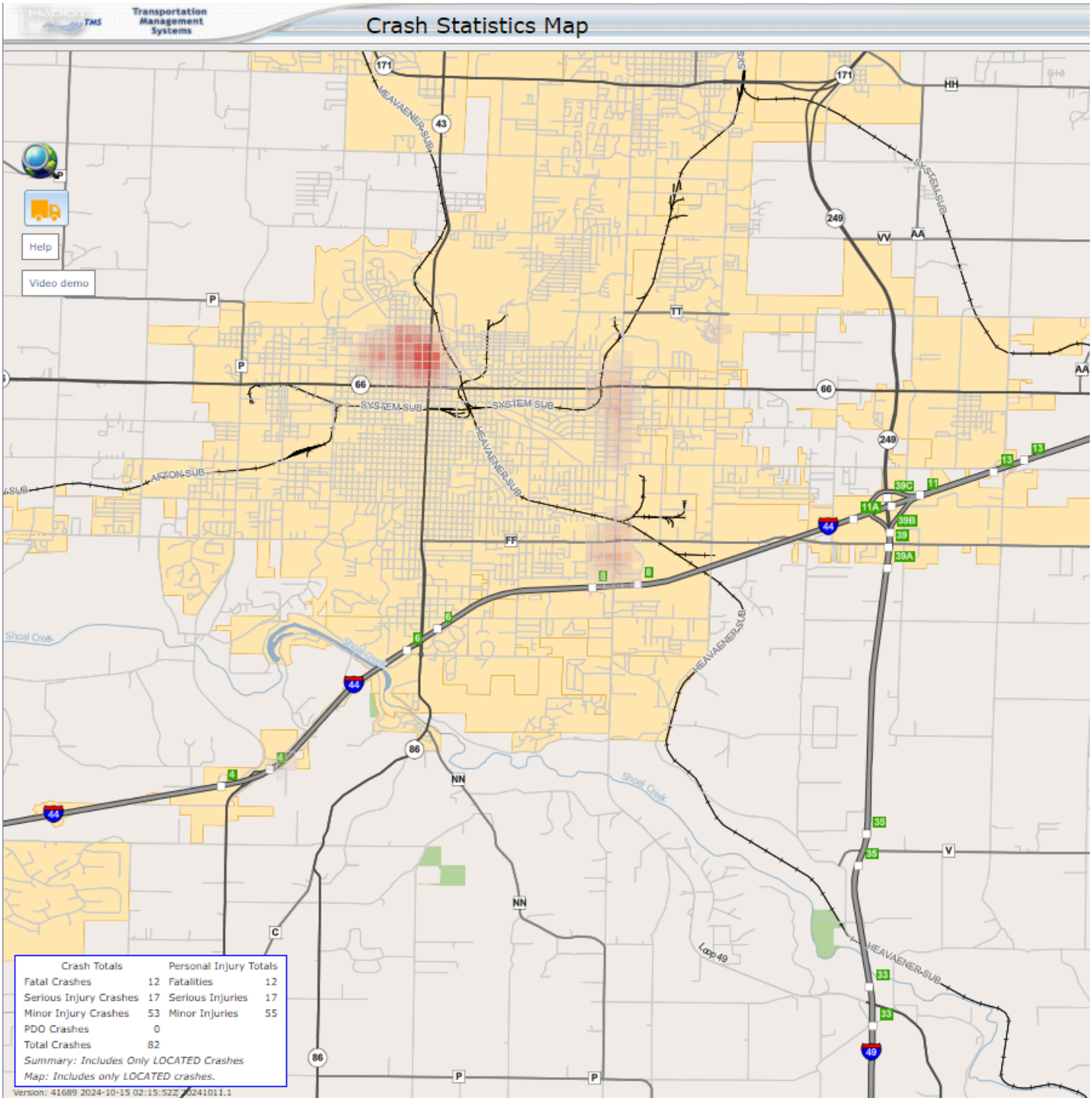


Source: MoDOT

Fatal
Serious Injury

JATSO ALL PEDESTRIAN INJURY CRASHES HEAT MAP

2019 - 2023

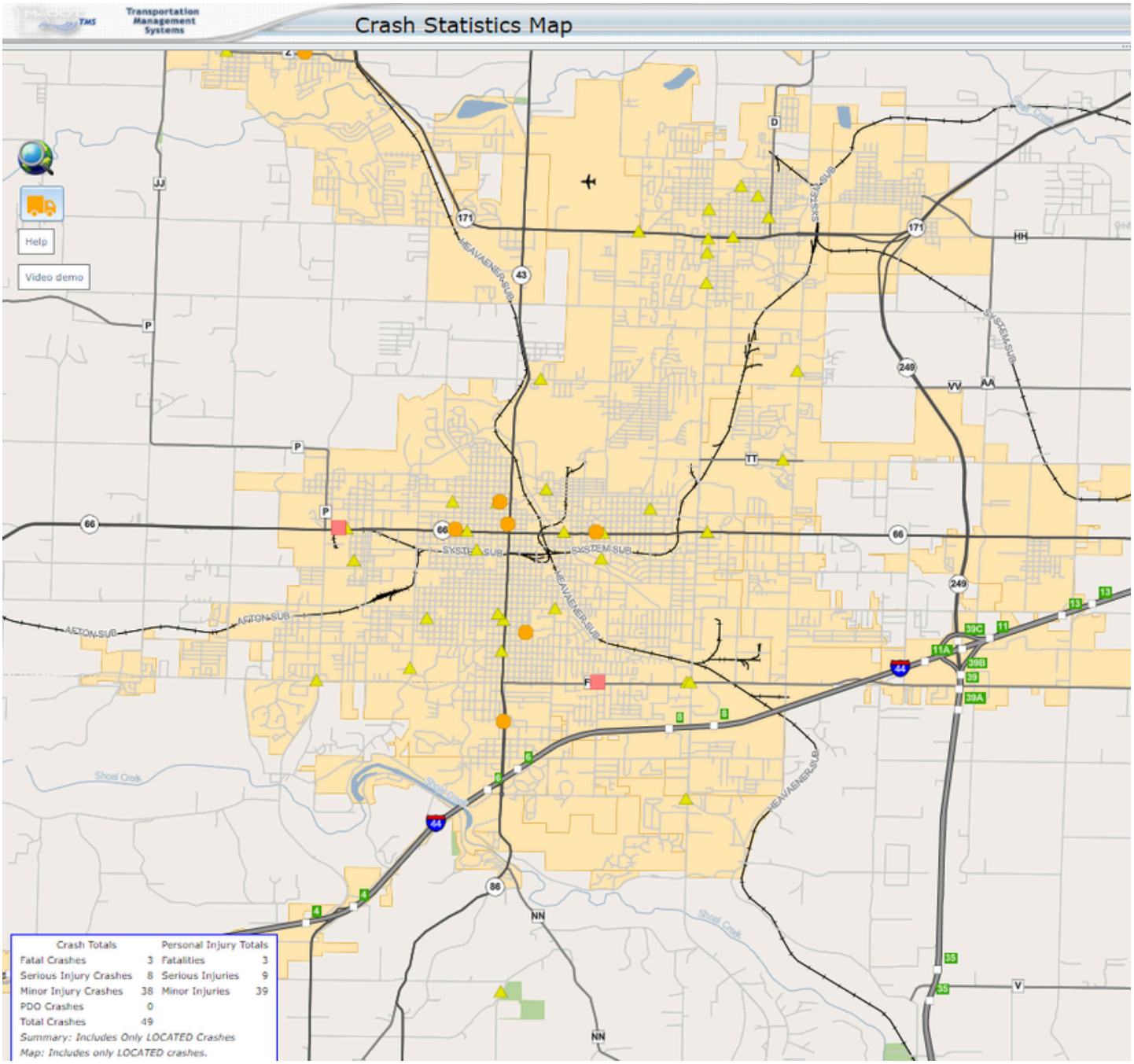


Source: MoDOT

JOPLIN AREA
Transportation Study Organization

JATSO ALL BICYCLE INJURY CRASHES

2019-2023



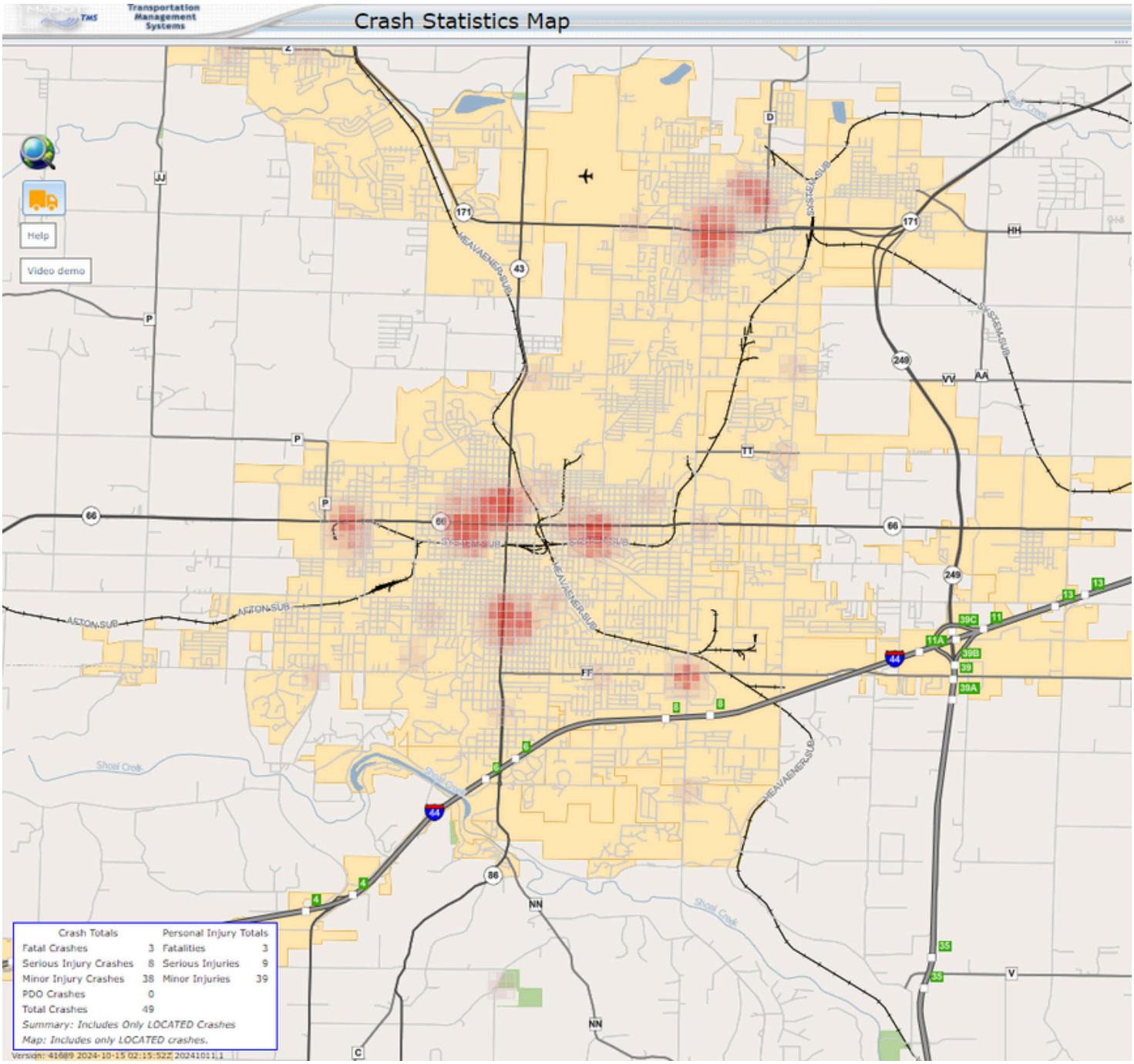
Source: MoDOT

Fatal
Serious Injury

JOPLIN AREA
Transportation Study Organization

JATSO ALL BICYCLE INJURY CRASHES HEAT MAP

2019-2023



Source: MoDOT

ONLINE SURVEY COMMUNITY FEEDBACK

Public Input on Problem Locations:

1. Range Line Road (50+ Comments)
    a. Particularly congested between 7th & 32nd
    b. Left turn issues/access management concerns
    c. Lack of pedestrian infrastructure
    d. High speeds
    e. Frequent red light running
2. 32nd Street (30+ Comments)
    a. Speeding issues
    b. Need for sidewalks
    c. Intersection safety concerns
    d. Red light running
3. 7th Street (25+ Comments)
    a. Poor road conditions
    b. Intersection issues (especially at St. Louis)
    c. Flooding concerns
    d. Heavy truck traffic
4. Main Street (20+ Comments)
5. Murphy Boulevard (15+ Comments)
    a. Multiple dangerous intersections (15th, 20th, Main)
    b. Poor visibility at curves
    c. Pedestrian safety concerns
6. 20th Street (15+ Comments)
7. Connecticut/St. Louis Avenue (12+ Comments)
8. 15th Street (10+ Comments)

Public Input on Infrastructure Needs:

1. Sidewalks (45+ Comments)
2. Protected bike lanes (35+ Comments)
3. Public transportation/bus system (30+ Comments)
4. Better street lighting (25+ Comments)
5. Better crosswalks (20+ Comments)
6. Return of trolley service (15+ Comments)
7. Road maintenance/repairs (15+Comments)
8. Better traffic signals (12+ Comments)

ONLINE SURVEY COMMUNITY FEEDBACK

Public Input on Safety Concerns:

1. Distracted driving (50+ Comments)
2. Speeding (35+ Comments)
3. Red light running (25+ Comments)
4. Lack of pedestrian safety (20+ Comments)
5. Poor intersection visibility (15+ Comments)
6. Roundabout confusion (12+ Comments)
7. Left turn safety (10+ Comments)

Public Input on Requested Improvements:

1. Better enforcement of traffic laws (30+ Comments)
2. More sidewalk connectivity (25+ Comments)
3. Protected bike infrastructure (20+ Comments)
4. Public transportation system (20+ Comments)
5. Better street maintenance (15+ Comments)
6. Enhanced crosswalk lighting (15+ Comments)
7. Driver education programs (12+Comments)
8. Better road striping/markings (10+ Comments)

Public Input on Specific Problem Areas:

1. Range Line at 32nd Street intersection
2. Range Line near Sam's Club/retail area
3. Murphy Boulevard at 15th Street
4. 20th Street near High School
5. Newman Road near MSSU
6. 7th and St. Louis intersection
7. Main Street downtown area
8. 32nd and Main intersection

Public Input on Vulnerable Users:

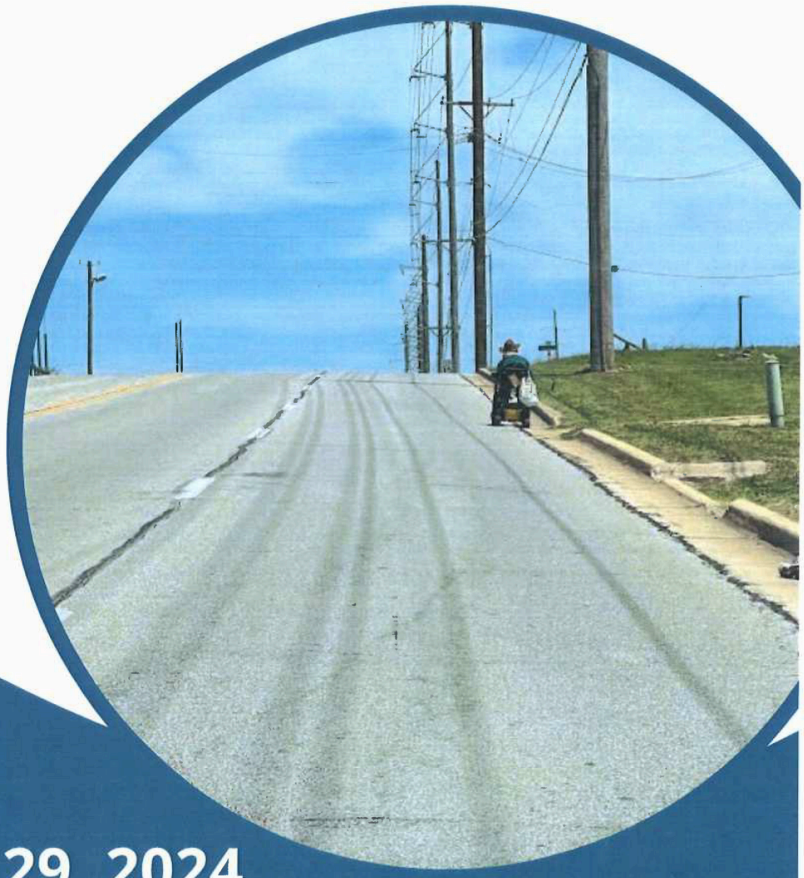
1. Pedestrians (particularly near schools)
2. Cyclists
3. College students
4. Elderly residents
5. People with disabilities
6. Public transit dependent individuals
7. School children
8. Low-income residents

OPEN HOUSE COMMUNITY FEEDBACK

JATSO Public Meeting
Library
October 29, 2024

- Guard rails on 20th street bridge – center of gravity is higher for bike riders.
- Challenges: Education for drivers on cyclist rights to the road - “as an active cyclist the biggest challenge I face is interactions with cars. Examples: unsafe passing, no protected bike lanes, speeds, not giving enough space/cutting off”
- Improper modes of transportation in the public roads
- Left turn lights should be read when a ped signal is activated
- Better bike lanes that connect and are of a decent amount of miles
- Little to no sidewalks that allow for active lifestyles
- Distracted drivers, excessive speeds, drivers not knowing how to navigate roundabouts.
- The lack of a sidewalk system, as well as a bike network presents a challenge to moving around the city/region without a car.
- Involving and collaborating with individuals and organizations that are familiar with road infrastructure/safety. Examples: school children, unhoused, non-profits

THE SILENT SUFFERING



OCTOBER 29, 2024

Images captured by Cynthia Torres, Vice President of Bike Walk Joplin



Veronica Davis, a civil engineer, community activist, and author of Inclusive Transportation: A Manifesto for Repairing Divided Communities defines the silent suffering as "people who are living with the consequences of bad transportation planning decisions." These are usually hard to reach people who are not afforded the privilege to sit down in meetings or voice their opinions about the lack of active transportation. This includes but is not limited to the unhoused community, people who are economically disadvantaged, the elderly, parents of young children, people who are working multiple jobs, and those who do not have equitable access to information about public forum meetings.

In the following pages, you will find images of those who are silently suffering due to the lack of inclusive infrastructure in the Joplin community. The unsafe conditions of our streets are forcing people to navigate spaces that are not designed for them or with them in mind.

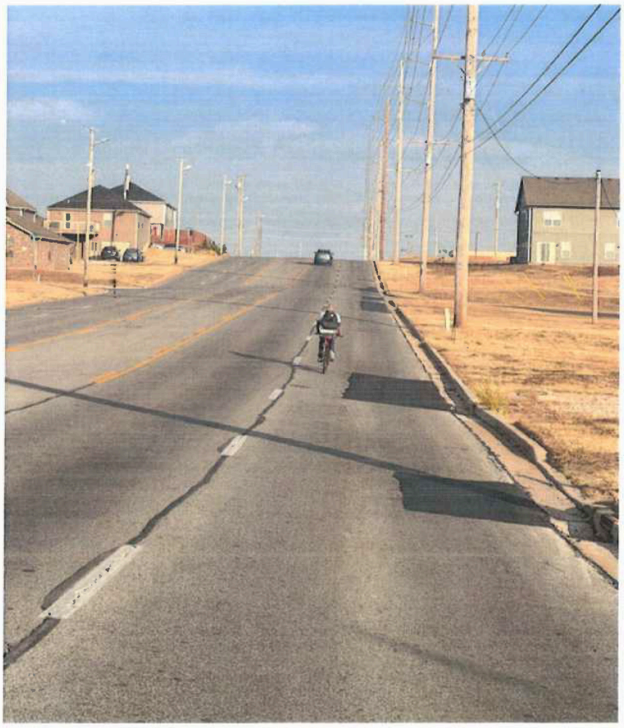
THIS YEAR ALONE

	Date	Time	Type	Veh Count	Severity	At Street	On Street	Injured	Killed
17	2024-01-08	18:05:00	Pedestrian	1	Fatal	CST MURPHY AVE	MO 66	0	1
30	2024-01-11	18:26:00	Pedestrian	1	Fatal	CST FINLEY	RT FF	0	1
67	2024-01-25	07:44:00	Pedalcycle	1	Personl Injury	CST MAIN ST	CST E 20TH ST	1	0
101	2024-02-01	11:20:00	Pedalcycle	1	Personl Injury	CST MAIN ST	CST E 20TH ST	1	0
103	2024-02-02	12:25:00	Pedalcycle	1	Personl Injury	CST JEFFERSON AVE	MO 66	1	0
215	2024-03-02	22:57:00	Pedestrian	1	Personl Injury	CST GLENDALE RD	CRD MCCLELLAND BLVD	1	0
314	2024-04-05	16:13:00	Pedalcycle	1	Personl Injury	CST JUNGE BLVD	CST SCHIFFERDECKER AVE	1	0
398	2024-04-24	14:26:00	Pedalcycle	1	Personl Injury	CST 9TH ST	CST SCHIFFERDECKER AVE	1	0
469	2024-05-08	10:32:00	Pedestrian	1	Personl Injury	CST STEVENS DR	RT FF	1	0
504	2024-05-16	17:03:00	Pedalcycle	1	Personl Injury	CST 6TH ST	CST MAIDEN LANE	1	0
532	2024-05-22	17:46:00	Pedestrian	1	Personl Injury	MO 66	CST MOFFET AVE	1	0
562	2024-05-30	13:49:00	Pedestrian	1	Personl Injury	PVT PRIVATE STREET	LP 49	1	0
570	2024-05-31	17:06:00	Pedestrian	1	Property Damage	CST W 24TH ST	CST JOPLIN AVE	0	0
565	2024-05-31	08:51:00	Pedestrian	1	Personl Injury	WEST OF LP 49	PP AT 2600 S RANGE LINE RD	1	0
589	2024-06-08	03:42:00	Pedalcycle	1	Personl Injury	CST TYLER AVE	MO 66	1	0
611	2024-06-12	22:55:00	Pedestrian	1	Personl Injury	CST GOLF RD	CST SCHIFFERDECKER AVE	1	0
661	2024-06-27	08:07:00	Pedestrian	1	Personl Injury	CST MAIN ST	CST E 9TH ST	1	0
666	2024-06-28	11:13:00	Pedestrian	1	Personl Injury	SOUTH OF CST TERRACE AVE	PP PARKING 1600 E 7TH ST	1	0
691	2024-07-04	21:49:00	Pedestrian	1	Fatal	CST BROWNELL AVE	CST UTICA ST	0	1
697	2024-07-07	06:30:00	Pedalcycle	1	Personl Injury	CST RIVERIA DR	CST HEARNES BLVD	1	0
839	2024-08-20	09:41:00	Pedalcycle	1	Personl Injury	CST S VIRGINIA AVE	MO 66	1	0
859	2024-09-19	18:24:00	Pedestrian	1	Personl Injury	CST JOPLIN AVE	CST 2ND ST	2	0
860	2024-09-20	18:11:00	Pedalcycle	1	Personl Injury	CST JACKSON AVE	CST 4TH ST	1	0

There have been 25 pedestrian & cyclist vehicle crashes since the start of this year.
A recent fatal crash occurred last Thursday on Main street.

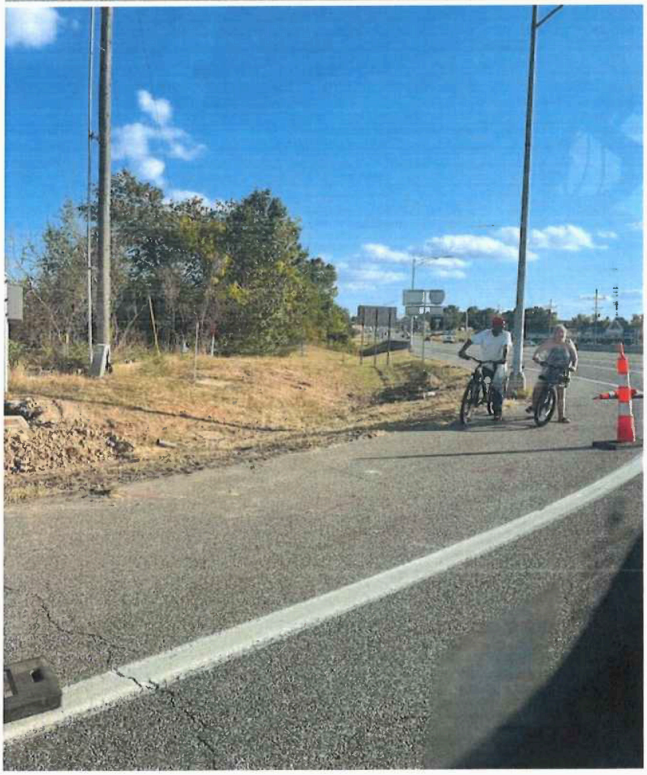
26th street houses important facets of our community including KCU, Joplin Senior Center, Bill & Virginia Leffen Center for Autism, Mercy & Cunningham Park.







Main street



Newman Road: With MSSU in close proximity, a lack of sidewalks and protected bike lanes is unusual for a university that has a successful running program and a growing number of international students

Joplin High School students running on 26th street





A North Middle School student walking to school on 2nd Street.



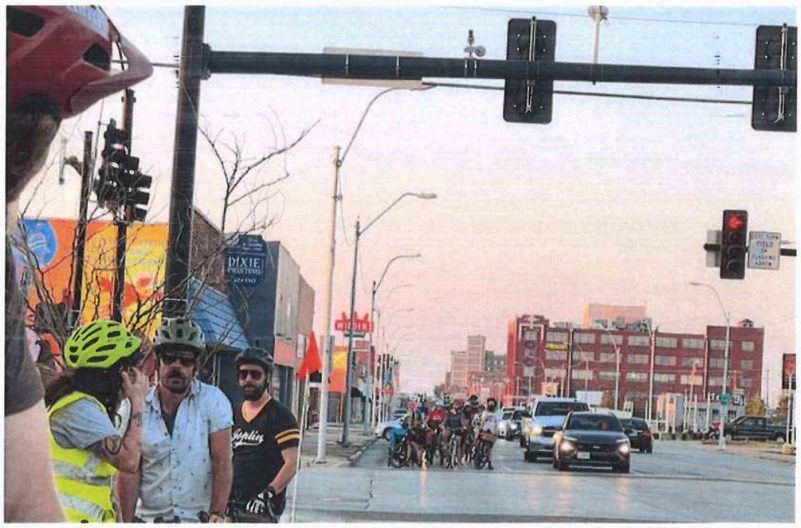
32nd Street: Person walking near hospital



KCU students walking on 26th Street.



Group ride down Main street



Frisco Greenway Trail and Zora Intersection Safety Issues

Public Comments

Trail Crossings ...we find the crossing sometimes quite dangerous all of a sudden you come off the trail and you're immediately on the street and back on the trail and we had a couple of incidents where there [were] sudden stops of cars I myself [have had] these experiences... [can you] ask for signs or speed buttons or whatever it takes to have people pay attention that some people just drive by they don't even know when there's a trail there right so ...but what you can do there with the city to make those crossings [more safe] there [?]

...marking the roads as a crosswalk just so that people see that they're crossing something. Down in Northwest Arkansas they're protected areas or places where the trail crosses the street as the trail or green and with white striping so that it's visible to the driver that they're crossing something. I think that would help because I've seen several close calls of traffic trying to stop for me while I'm already stopped people slam on their brakes and then almost get rear-ended ....

i was wondering about the Frisco trail on Zora, for the area with the cross walk going through the main street of Zora I have seen some almost accident with bicycles. So legally who has the right of way there since there is no stop sign for pedestrian or bicycle who would be at fault because this seems to be very dangerous road when the bicycles are going fast through the trails and directly into traffic when we are driving 35-40 mph and can't stop on a dime

... I've also noticed particularly on Frisco uh when the traffic is moving East West [on Zora] sometimes they got the sun right Square in their eyes if you're walking in the morning so whatever you do you kind of have to think about the driver and the problems he could be having seeing you .. so ...I'm overall...more concerned about safety.....

Facebook Comments

Post impressions	Post reach	Engagement
2,937 *	2,800	420

* Most popular post of the year



There's way too many accidents because of vehicles speeding. A speed bump might help slow the vehicles down.

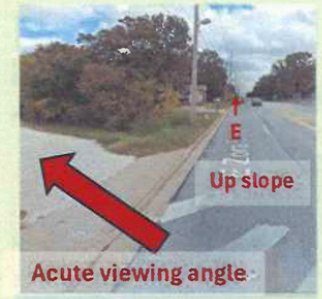
This isn't a "safety sign." It's a dystopian reminder that private automobiles are always given complete dominance over the needs of humans.

Looks great!! I will feel better driving through this area now because I have seen bicyclist going full speed into traffic with their children thinking they have the right of way

When it's flesh vs. steel,...steel ALWAYS wins! Thank for the signs, effort and the reminder

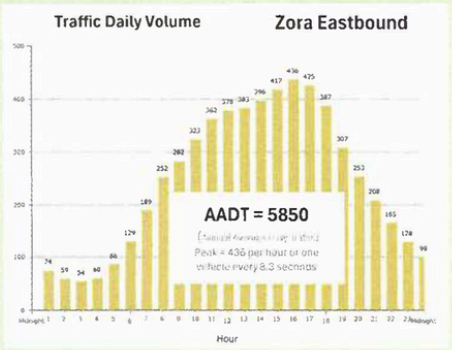
Intersection Issues

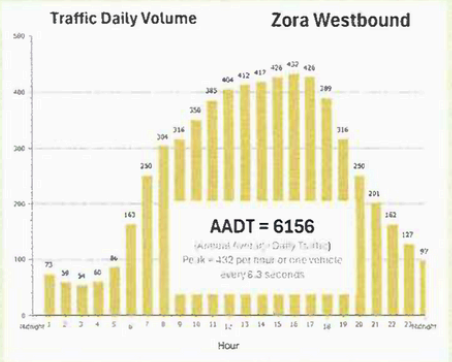


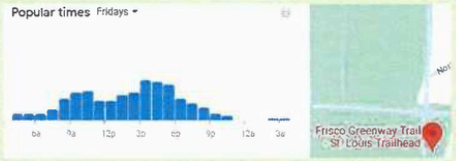




Traffic Data



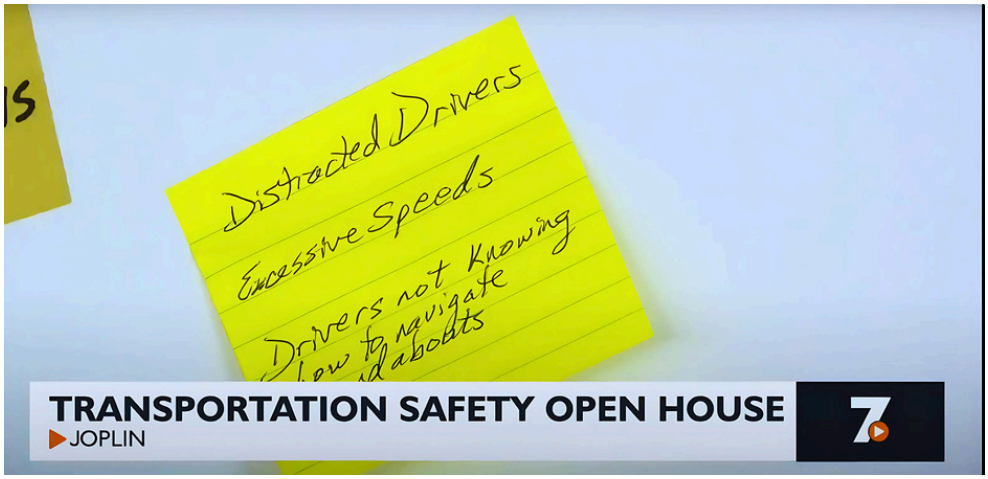




This trailhead is by far the most visited. We don't have current visit data the actual numbers. Most users cross at Zora, though not all.

Source: YouTube, Facebook, MODOT, Google Maps







News Coverage of Public Engagement Meeting
https://www.youtube.com/embed/yi_RZGWP89c?si=hDFP3_1vW9n3uwig

Project Prioritization Based on Safety Action Plan Scoring System

First Tier Projects

Rank	Plan	Project Name	Approximate Location	Description	Project Score
1	2024 JATSO Needs List	7th Street	Between Shifferdecker to Range Line	Pavement, ADA, Storm Water, and Operational Improvements	32
2	HIN Segment	MO 66 E	HIN End Points	Evaluate for road diet. Evaulate signalized intersections for Flashing Yellow Arrow installation	30
3	HIN Segment	LP 49 S (Range Line)	HIN End Points	Improve roadway lighting. Reduce left turning conflicts	29
4	HIN Segment	MO 43 S	HIN End Points	Evaluate for low cost safety improvements	29
5	HIN Segment	RT FF (32nd Street)	HIN End Points	Evaluate for road diet. Evaulate signalized intersections for Flashing Yellow Arrow installation	29
6	Active Transportation Plan	Wall Ave - Downtown Loop	Between 2nd Street and 15th	Road diet with bike lane and speed limit reduction	27
7	Active Transportation Plan	15th Street - Downtown Loop	Between Wall Ave and Connecticut	Road diet with bike lanes	27
8	HIN Segment	W 20TH ST	HIN End Points	Reduce speed limit, consider access management strategy	26
9	HIN Segment	MO 171 S	HIN End Points	Evaluate for road diet. Review guardrail near bridge ends.	26
10	Active Transportation Plan	Broadway/2nd Street - Downtown Loop	Between St. Louis and Wall Avenue	Bike lane conversion	25
11	HIN Segment	IS 44 E	HIN End Points	Reduce speed limit, consider pedestrian fencing	25
12	HIN Segment	IS 44 W	HIN End Points	Reduce speed limit, consider pedestrian fencing	25
13	HIN Segment	E 20TH ST	HIN End Points	Reduce speed limit, consider access management strategy	24
14	HIN Segment	IS 49 N	HIN End Points	Verify signing, on-ramp merge lane.	24
15	Active Transportation Plan	Wall Ave Active Transportation	Between 15th Street and 20th	Road diet with bike lane and speed limit reduction	23
16	HIN Intersections	32nd Street and Connecticut Ave	RT FF E CST CONNECTICUT AVE	Review signal phasing for protected left at certain times.	22
17	Active Transportation Plan	15th Street	Between Connecticut and Rangeline	Road diet with bike lanes	21
18	HIN Intersections	Wall Ave and 15th	CST WALL AVE N CST 15TH ST	Add stop control for SB Wall St.	20
19	HIN Intersections	15th Street and Murphy Blvd	CST 15TH ST E CST MURPHY BLVD	Consider Roundabout or some form of intersection traffic control	20
20	HIN Intersections	32nd Street and McClelland Blvd	CST W 32ND ST E CRD MCCLELLAND BLVD	Reduce speed limit and evaluate traffic control for improvements	20

Second Tier Projects

Rank	Plan	Project Name	Approximate Location	Description	Project Score
21	HIN Intersections	20th Street and Byers Ave	CST W 20TH ST E CST BYERS AVE	Safety Improvements	18
22	HIN Intersections	7th Street and Chestnut Ave	MO 66 E CST CHESTNUT AVE	Safety Improvements	18
23	HIN Intersections	Rangeline and 7th Street	LP 49 S MO 66	Safety Improvements	18
24	2024 JATSO Needs List	Duquesne Rd	From Newman Rd to 7th St	Pedestrian Sidewalks and ADA improvements	17
25	S	Wall Avenue and 7th	Intersection	Bike lane through signalized intersection	17
26	Active Transportation Plan	Joplin Avenue and 15th Street	Intersection	Bike lane through signalized intersection	17
27	Active Transportation Plan	Joplin Ave 1	Between 15th Street and 20th	Replace parking with bike lane, reduced through lanes, addition of buffer zone	17
28	Active Transportation Plan	St Louis Ave - Downtown Loop 2	Between 2nd and Frisco Trail	Road diet with bike lane and speed limit reduction	17
29	Active Transportation Plan	St Louis Ave - Downtown Loop 1	Between Campbell Parkway and 2nd Street	Road diet with bike lane and speed limit reduction	17
30	Active Transportation Plan	Joplin Ave 2	Between 20th Street and 31st Street	Bike Lane	17
31	HIN Intersections	MO 66 and Central City Road	MO 66 W CRD CENTRAL CITY ROAD	Safety Improvements	17
32	HIN Intersections	Rangeline and Missouri TT	LP 49 S RT TT	Safety Improvements	17
33	HIN Intersections	Route D and Ivy Road	RT D E CRD IVY ROAD	Safety Improvements	17
34	2024 JATSO Needs List	15th Street	Intersection Between New Hampshire and Massachusets	Grade Seperated Multi-use path crossing	16
35	HIN Intersections	Rangeline and 20th Street	LP 49 S CST E 20TH ST	Safety Improvements	16
36	HIN Intersections	Rangeline and Private Entrances n/o 32nd	LP 49 S CST RANGE LINE RD (SJ)	Safety Improvements	16
37	HIN Intersections	32nd Street and Mississippi Ave	RT FF E CST MISSISSIPPI AVE	Safety Improvements	16
38	HIN Intersections	32nd Street and Arizona Ave	RT FF E CST ARIZONA AVE	Safety Improvements	16
39	HIN Intersections	Rangeline and 8th Street	LP 49 S CST 8TH ST	Safety Improvements	16
40	HIN Intersections	Main Street (MO 43) and 26th Street	MO 43 S CST 26TH ST	Safety Improvements	16
41	Active Transportation Plan	Connecticut Ave	Between 15th and 30th	Bike lane conversion	15
42	HIN Intersections	32nd Street and Duquesne Road	RT FF E CST DUQUESNE RD	Safety Improvements	15
43	Active Transportation Plan	4th Street	School Avenue and Maiden Lane	Bike lane conversion	14
44	HIN Intersections	7th Street and Illinois Ave	MO 66 E CST ILLINOIS AVE	Safety Improvements	14
45	Active Transportation Plan	Junge Boulevard	Between Maiden Lane and Alley west of Pearl	Road diet with bike lanes	13

Project Prioritization Based on Safety Action Plan Scoring System

Third Tier Projects

Rank	Plan	Project Name	Approximate Location	Description	Project Score
46	Active Transportation Plan	Joplin Ave - Downtown Loop	Between 2nd Street and 15th	Replace parking with bike lane, reduced through lanes, addition of buffer zone	12
47	Active Transportation Plan	Maiden Lane	Between 26th and Junge Boulevard	Bike lane conversion	12
48	2024 JATSO Needs List	4th and Murphy	Intersection	Grade Seperated Multi-use path crossing	11
49	2024 JATSO Needs List	Schifferdecker Ave	Belle Center Road (Rt P) to MO 66 (7th Street)	Capacity Improvements and Bike/Ped Accomodations	11
50	Active Transportation Plan	Junge Boulevard	Between Alley and Pearl Ave	Sharrow	11
51	Active Transportation Plan	Junge Boulevard	Pearl Avenue and Wall Ave	Bike lane conversion	11
52	Active Transportation Plan	13th Street	Wall Ave and Main Street	Bike lane conversion	11
53	Active Transportation Plan	Wall Ave 2	Between 20th Street and 31st Street	Road diet with bike lane and speed limit reduction	11
54	HIN Intersections	Rangeline and Fountain Road	LP 49 S CST FOUNTAIN RD	Safety Improvements	11
55	HIN Intersections	Gateway Drive and Cedar Drive	LP 49 S LP 49 (NJ)	Safety Improvements	11
56	HIN Intersections	Perkins Street and Maiden Lane	CST PERKINS ST E CST MAIDEN LANE	Safety Improvements	11
57	HIN Intersections	44th Street and Connecticut Ave	CST E 44TH ST E CST CONNECTICUT AVE	Safety Improvements	11
58	HIN Intersections	7th Street and Walmart Entrance	MO 66 E PVT WALMART	Safety Improvements	11
59	2024 JATSO Needs List	Central City Road	From 32nd Street to MO 66	Capacity Improvements and Bike/Ped Accomodations	9
60	Active Transportation Plan	26th Street	Between Main Street and Maiden lane	Road diet with bike lanes	9
61	Active Transportation Plan	Broadway/2nd Street	Between Main Street and Maiden lane	Bike lane conversion	8
62	2024 JATSO Needs List	Along Turkey Creek	From Frisco Trail to Dover Hill Bike park	Multi-Use Path	7
63	Active Transportation Plan	Broadway Street and Virginia Ave	Intersection	Bike lane through signalized intersection	6
64	Active Transportation Plan	Connecticut Ave - Downtown Loop	Between 15th and Campbell Parkway	Bike lane conversion	6
65	Active Transportation Plan	Schifferdecker Ave	Between 26th and 13th Street	Bike lane conversion	6
66	2024 JATSO Needs List	Zora St	Schifferdecker Road to Main Street	Capacity Improvements and Bike/Ped Accomodations	5
67	2024 JATSO Needs List	Route Z at CJ HS	Intersection	Traffic Signal, Speed reduction, or x-walk improvements at Carl Junction HS	5
68	2024 JATSO Needs List	Main Street	From Dover Hill Elementary to Dover Hill Bike park	Multi-Use Path	5
69	2024 JATSO Needs List	Murphy Blvd	From Dover Hill Recreation Area to Joplin Sports Complex	Multi-Use Path	5
70	2024 JATSO Needs List	MO-171 and Frisco Trail	Intersection	Grade Seperated Multi-use path crossing	5
71	2024 JATSO Needs List	St Louis	From Zora to 171	Capacity Improvements and Bike/Ped Accomodations	5

Project Prioritization Based on Safety Action Plan Scoring System

SAP Rank	Plan	Project Name	Approximate Location	Description	Road & Bridge Projects Score
4	HIN Segment	MO 43 S	HIN End Points	Safety Improvements	56
3	HIN Segment	LP 49 S (Range Line)	HIN End Points	Safety Improvements	53
9	HIN Segment	MO 171 S	HIN End Points	Safety Improvements	47
2	HIN Segment	MO 66 E	HIN End Points	Safety Improvements	43
11	HIN Segment	IS 44 E	HIN End Points	Safety Improvements	42
1	2024 JATSO Needs List	7th Street	Between Shifferdecker to Range Line	Pavement, ADA, Storm Water, and Operational Improvements	40
5	HIN Segment	RT FF E	HIN End Points	Safety Improvements	40
23	HIN Intersections	Rangeline and 7th Street	LP 49 S MO 66	Safety Improvements	40
22	HIN Intersections	7th Street and Chestnut Ave	MO 66 E CST CHESTNUT AVE	Safety Improvements	35
24	2024 JATSO Needs List	Duquesne Rd	From Newman Rd to 7th St	Pedestrian Sidewalks and ADA improvements	35
32	HIN Intersections	Rangeline and Missouri TT	LP 49 S RT TT	Safety Improvements	35
12	HIN Segment	IS 44 W	HIN End Points	Safety Improvements	32
31	HIN Intersections	MO 66 and Central City Road	MO 66 W CRD CENTRAL CITY ROAD	Safety Improvements	28
35	HIN Intersections	Rangeline and 20th Street	LP 49 S CST E 20TH ST	Safety Improvements	27
14	HIN Segment	IS 49 N	HIN End Points	Safety Improvements	22
16	HIN Intersections	32nd Street and Connecticut Ave	RT FF E CST CONNECTICUT AVE	Safety Improvements	22
33	HIN Intersections	Route D and Ivy Road	RT D E CRD IVY ROAD	Safety Improvements	20
37	HIN Intersections	32nd Street and Mississippi Ave	RT FF E CST MISSISSIPPI AVE	Safety Improvements	15
38	HIN Intersections	32nd Street and Arizona Ave	RT FF E CST ARIZONA AVE	Safety Improvements	15
34	2024 JATSO Needs List	15th Street	Intersection Between New Hampshire and Massachusets	Grade Seperated Multi-use path crossing	0

SAP Rank	Plan	Project Name	Approximate Location	Description	VRU Project Score
4	HIN Segment	MO 43 S	HIN End Points	Safety Improvements	56
3	HIN Segment	LP 49 S (Range Line)	HIN End Points	Safety Improvements	51
9	HIN Segment	MO 171 S	HIN End Points	Safety Improvements	50
2	HIN Segment	MO 66 E	HIN End Points	Safety Improvements	46
5	HIN Segment	RT FF E	HIN End Points	Safety Improvements	41
1	2024 JATSO Needs List	7th Street	Between Shifferdecker to Range Line	Pavement, ADA, Storm Water, and Operational Improvements	38
24	2024 JATSO Needs List	Duquesne Rd	From Newman Rd to 7th St	Pedestrian Sidewalks and ADA improvements	37
34	2024 JATSO Needs List	15th Street	Intersection Between New Hampshire and Massachusets	Grade Seperated Multi-use path crossing	32
11	HIN Segment	IS 44 E	HIN End Points	Safety Improvements	30
23	HIN Intersections	Rangeline and 7th Street	LP 49 S MO 66	Safety Improvements	30
22	HIN Intersections	7th Street and Chestnut Ave	MO 66 E CST CHESTNUT AVE	Safety Improvements	27
32	HIN Intersections	Rangeline and Missouri TT	LP 49 S RT TT	Safety Improvements	25
16	HIN Intersections	32nd Street and Connecticut Ave	RT FF E CST CONNECTICUT AVE	Safety Improvements	23
12	HIN Segment	IS 44 W	HIN End Points	Safety Improvements	20
31	HIN Intersections	MO 66 and Central City Road	MO 66 W CRD CENTRAL CITY ROAD	Safety Improvements	20
35	HIN Intersections	Rangeline and 20th Street	LP 49 S CST E 20TH ST	Safety Improvements	17
33	HIN Intersections	Route D and Ivy Road	RT D E CRD IVY ROAD	Safety Improvements	15
14	HIN Segment	IS 49 N	HIN End Points	Safety Improvements	10
37	HIN Intersections	32nd Street and Mississippi Ave	RT FF E CST MISSISSIPPI AVE	Safety Improvements	5
38	HIN Intersections	32nd Street and Arizona Ave	RT FF E CST ARIZONA AVE	Safety Improvements	5

Safety Countermeasures Resources



The FHWA has identified and is promoting widespread use of a set of 28 Proven Safety Countermeasures that can offer significant, measurable impacts as part of any agency's data-driven, systemic approach to improving safety. These strategies are designed to enhance safety on all kinds of roads—from rural to urban, from high-volume freeways to less traveled two-lane State and county roads, from signalized crossings to horizontal curves, and everything in between. Each countermeasure addresses **speed management, intersections, roadway departures,** or **pedestrians/ bicyclists**—along with crosscutting strategies that address all four safety focus areas.

Which Proven Safety Countermeasures Will You Use?

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures.

U.S. Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE
https://safety.fhwa.dot.gov/

Safety Countermeasures Resources



Speed Safety Cameras



Safety Benefits:
Fixed units can reduce crashes on urban principal arterials up to:

54% for all crashes.[4]

48% for injury crashes.[4]

P2P units can reduce crashes on urban expressways, freeways, and principal arterials up to:

37%
for fatal and injury crashes.[2]

Mobile units can reduce crashes on urban principal arterials up to:

20%
for fatal and injury crashes.[5]

In New York City, fixed units reduced speeding in school zones up to 63% during school hours.[6]

For more information on this and other FHWA Proven Safety Countermeasures, please reference the: Speed Safety Camera Program Planning and Operations Guide.

The contents of this Fact Sheet do not have the force and effect of law and are not meant to bind the public in any way. This Fact Sheet is intended only to provide clarity regarding existing requirements under the law or agency policies.

FHWA-SA-21-070

Variable Speed Limits



Safety Benefits:
VSLs can reduce crashes on freeways up to:

34%
for total crashes.[1]

65%
for rear-end crashes.[1]

51%
for fatal and injury crashes.[1]

Benefit/Cost Ratios range between[1]

9:1 - 40:1

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/speed-management/reference-materials.

FHWA-SA-21-054

Appropriate Speed Limits for All Road Users



Safety Benefits:

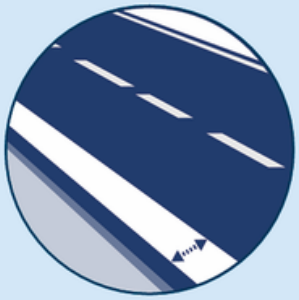
Traffic fatalities in the City of Seattle decreased 26 percent after the city implemented comprehensive, city-wide speed management strategies and countermeasures inspired by Vision Zero. This included setting speed limits on all non-arterial streets at 20 mph and 200 miles of arterial streets at 25 mph.[5]

One study found that on rural roads, when considering other relevant factors in the engineering study along with the speed distribution, setting a speed limit no more than 5 mph below the 85th-percentile speed may result in fewer total and fatal plus injury crashes, and lead to drivers complying closely with the posted speed limit.[6]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/speed-management/reference-materials.

FHWA-SA-21-034

Wider Edge Lines



Safety Benefits:
Wider edge lines can reduce crashes up to:

37%
for non-intersection, fatal and injury crashes on rural, two-lane roads.[2]

22%
for fatal and injury crashes on rural freeways.[3]

Benefit Cost Ratio
25:1
for fatal and serious injury crashes on two-lane rural roads.[4]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/other/visibility/pavement-markings.

FHWA-SA-21-055

Enhanced Delineation for Horizontal Curves



Safety Benefits:

Chevron Signs
25% reduction in nighttime crashes.[1]
16% reduction in non-intersection fatal and injury crashes.[2]

Oversized Chevron Signs
15% reduction in fatal and injury crashes.[3]

Sequential Dynamic Chevrons
60% reduction in fatal and injury crashes.[4]

In-Lane Curve Warning Pavement Markings
35 - 38% reduction in all crashes.[5]

New Fluorescent Curve Signs or Upgrade Existing Curve Signs to Fluorescent Sheeting
18% reduction in non-intersection, head-on, run-off-road, and sideswipe in rural areas.[1]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/keep-vehicles-road/horizontal-curve-safety.

FHWA-SA-21-035

Longitudinal Rumble Strips & Stripes



Safety Benefits:

Center Line Rumble Strips
44-64%
reduction in head-on fatal and injury crashes on two-lane rural roads.[4]

Shoulder Rumble Strips
13-51%
reduction in single vehicle, run-off-road fatal and injury crashes on two-lane rural roads.[4]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/keep-vehicles-road/rumble-strips.

FHWA-SA-21-036

SafetyEdgeSM



Safety Benefits:

11%
reduction in fatal and injury crashes.[2]

21%
reduction in run-off-road crashes.[2]

19%
reduction in head-on crashes.[2]

Benefit-Cost Ratio Range[3]
700:1 to 1,500:1

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/provide-safe-recovery/safetyedge.

FHWA-SA-21-038

Roadside Design Improvements at Curves



Safety Benefits:

Flatten sideslope from 1V:3H to 1V:4H:
8%
reduction for single-vehicle crashes.[2]

Flatten sideslope from 1V:4H to 1V:6H:
12%
reduction for single-vehicle crashes.[2]

Increase the distance to roadside features from 3.3 ft to 16.7 ft:
22%
reduction for all crashes.[3]

Increase the distance to roadside features from 16.7 ft to 30 ft:
44%
reduction for all crashes.[3]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/provide-safe-recovery/clear-zones/clear-zones.

FHWA-SA-21-029

Median Barriers



8%
of all fatalities on divided highways are due to head-on crashes.[1]

Safety Benefits:

Median Barriers Installed on Rural Four-Lane Freeways
97%
reduction in cross-median crashes.[2]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/reduce-crash-severity.

FHWA-SA-21-037

Backplates w/ Retroreflective Borders



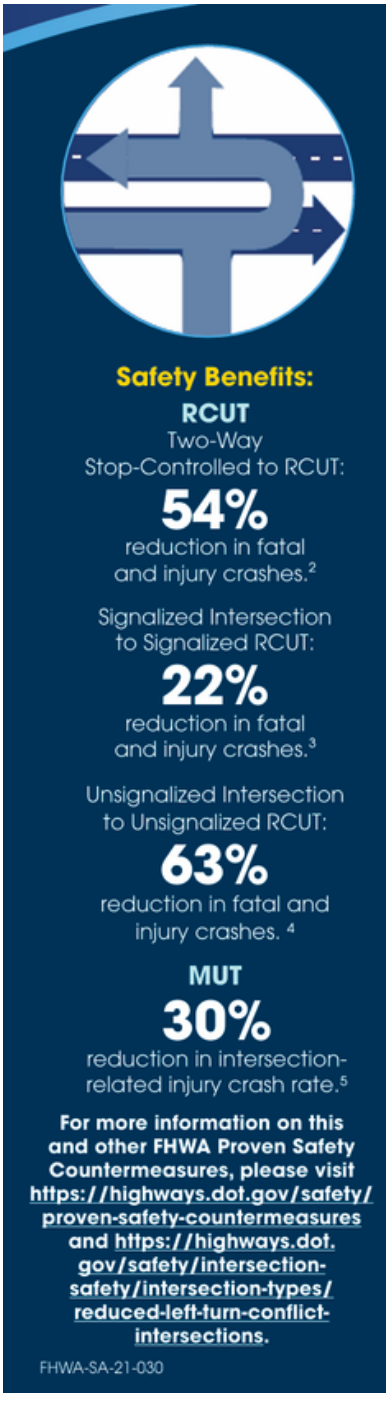
Corridor Access Management



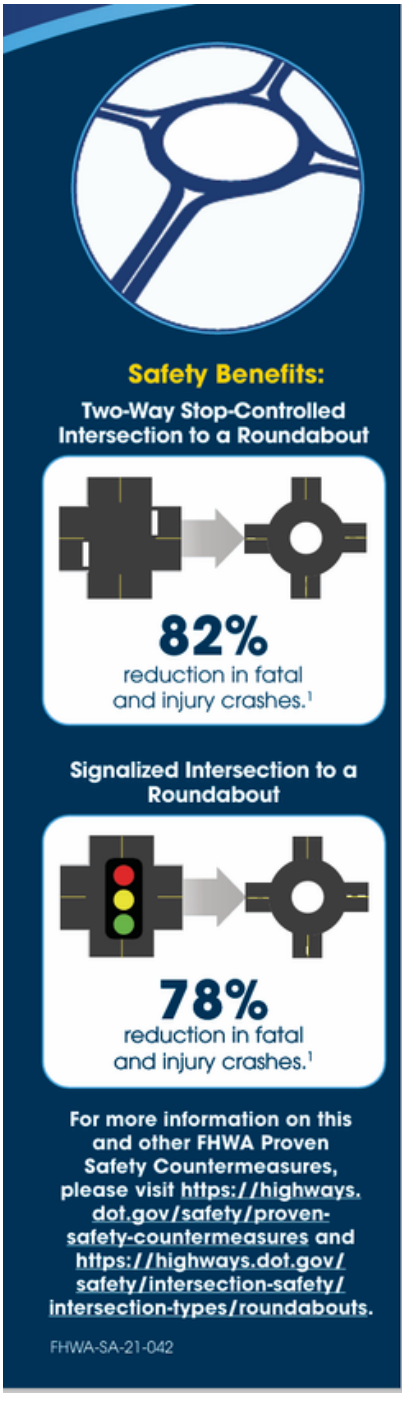
Dedicated Left- and Right-Turn Lanes at Intersections



Reduced Left-Turn Conflict Intersections



Roundabouts



Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections



Yellow Change Intervals



Safety Benefits:

36-50%
reduction in red light running.[3]

8-14%
reduction in total crashes.[3]

12%
reduction in injury crashes.[3]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/fhwasa13027.pdf.

FHWA-SA-21-043

Crosswalk Visibility Enhancements



Safety Benefits:

High-visibility crosswalks can reduce pedestrian injury crashes up to:
40%[1]

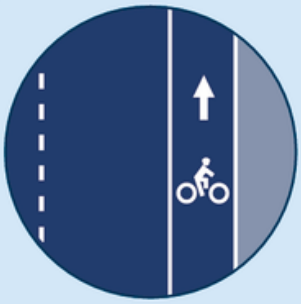
Intersection lighting can reduce pedestrian crashes up to:
42%[2]

Advance yield or stop markings and signs can reduce pedestrian crashes up to:
25%[3]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/techSheetVizEnhancemt2018.pdf.

FHWA-SA-21-049

Bicycle Lanes



Safety Benefits:

Converting traditional or flush buffered bicycle lanes to a separated bicycle lane with flexible delineator posts can reduce crashes up to:
53%
for bicycle/vehicle crashes.[3]

Bicycle Lane Additions can reduce crashes up to:
49%
for total crashes on urban 4-lane undivided collectors and local roads.[7]

30%
for total crashes on urban 2-lane undivided collectors and local roads.[7]



Bicycle lane in Washington, DC. Source: Alex Baca, Washington Area Bicyclist Association.

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-07/fhwasa18077.pdf.

FHWA-SA-21-051

Rectangular Rapid Flashing Beacons (RRFB)



Safety Benefits:

RRFBs can reduce crashes up to:

47%

for pedestrian crashes.[4]

RRFBs can increase motorist yielding rates up to:

98%

(varies by speed limit, number of lanes, crossing distance, and time of day).[3]



RRFBs used at a trail crossing. Source: LJB

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/techSheet_RRFB_2018.pdf.

FHWA-SA-21-053

Leading Pedestrian Interval



Safety Benefits:

13%

reduction in pedestrian-vehicle crashes at intersections.[2]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/fhwasa19040.pdf.

FHWA-SA-21-032

Medians & Pedestrian Refuge Islands in Urban & Suburban Areas



Safety Benefits:

Median with Marked Crosswalk

46%

reduction in pedestrian crashes.[2]

Pedestrian Refuge Island

56%

reduction in pedestrian crashes.[2]

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-08/techSheet_PedRefugeIsland2018.pdf.

FHWA-SA-21-044

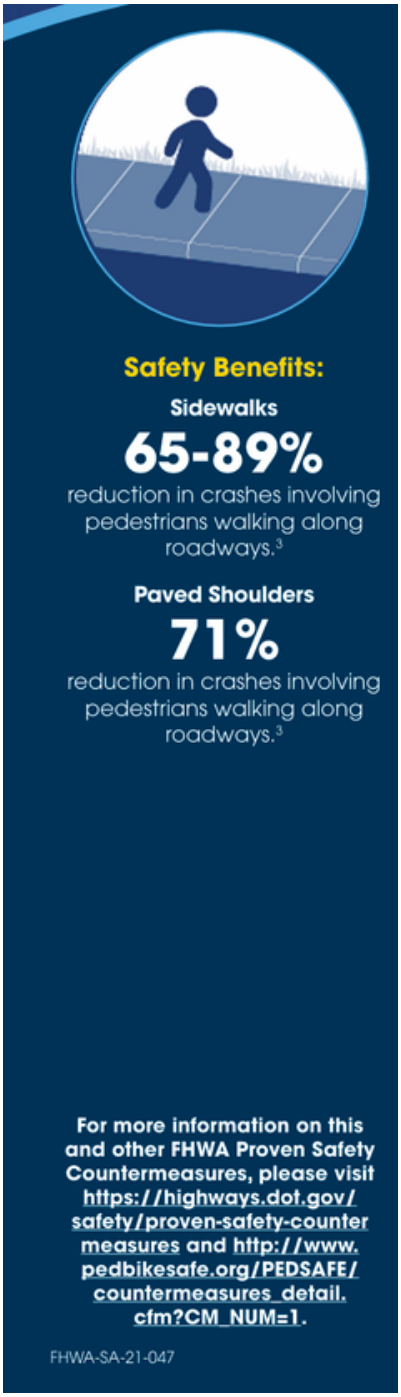
Pedestrian Hybrid Beacons



Road Diets



Walkways



Pavement Friction Management



Safety Benefits:
HFST can reduce crashes up to:

63%
for injury crashes at ramps.[2]

48%
for injury crashes at horizontal curves.[2]

20%
for total crashes at intersections.[3]



Automated application of HFST.
Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/rwd/keep-vehicles-road/pavement-friction/hfst.

FHWA-SA-21-052

Lighting

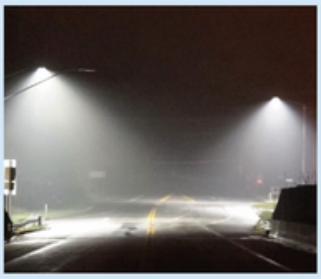


Safety Benefits:
Lighting can reduce crashes up to:

42%
for nighttime injury pedestrian crashes at intersections.[1]

33-38%
for nighttime crashes at rural and urban intersections.[2,1]

28%
for nighttime injury crashes on rural and urban highways.[1]



Source: FHWA

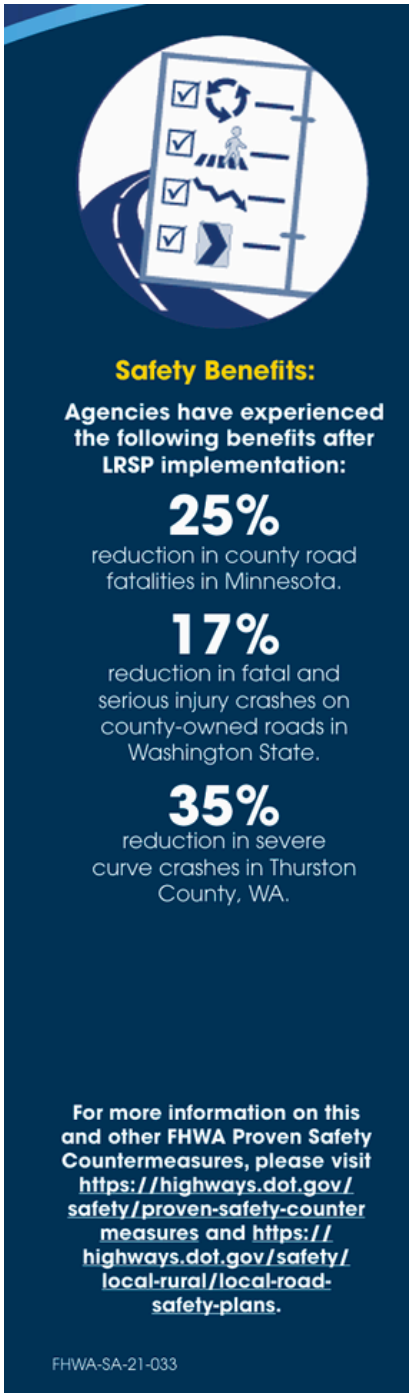
For more information on this and other FHWA Proven Safety Countermeasures, please visit https://highways.dot.gov/safety/proven-safety-countermeasures and https://highways.dot.gov/safety/other/visibility/roadway-lighting-resources.

FHWA-SA-21-050

Road Safety Audit



Local Road Safety Plans



Safety Resources

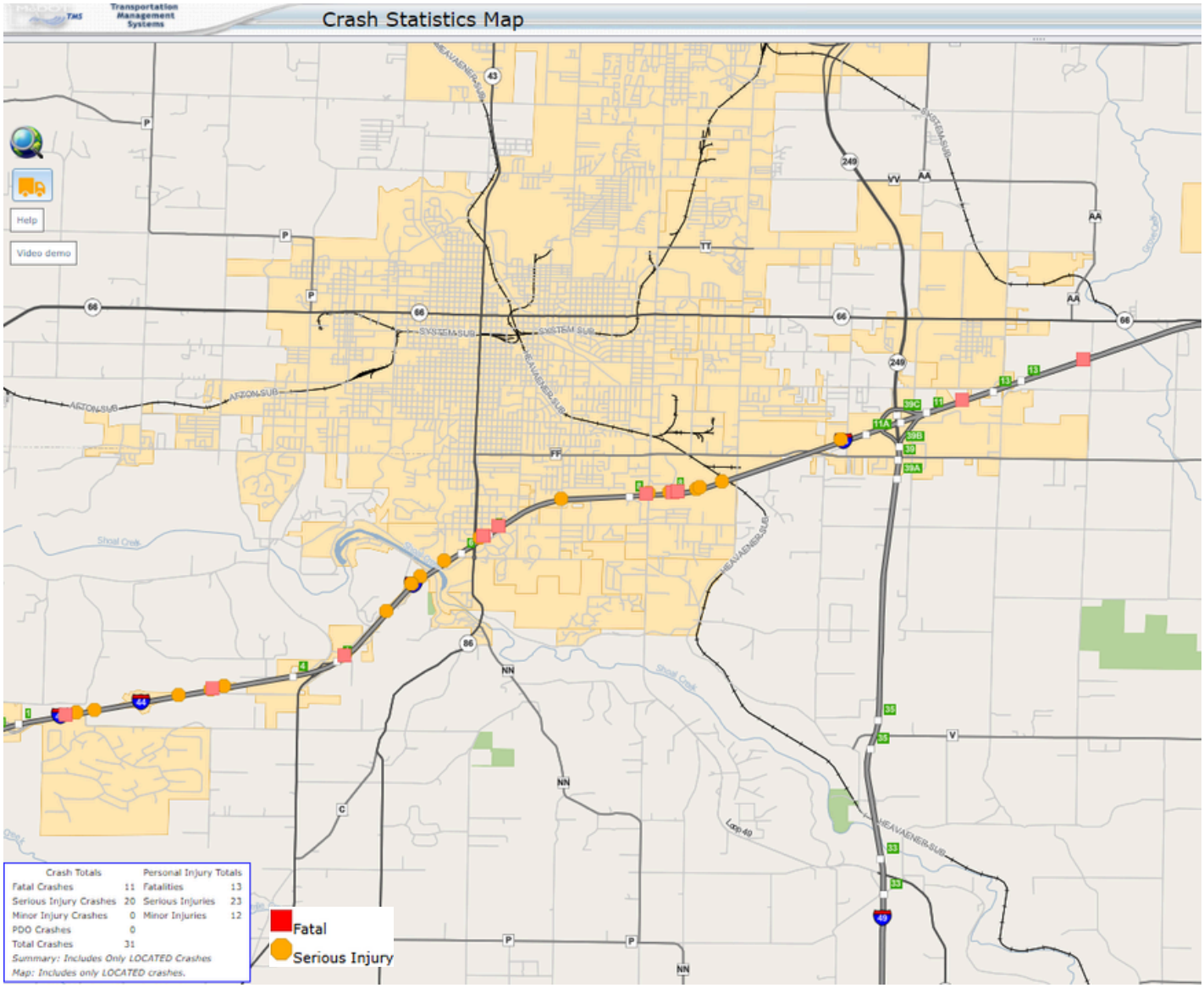


https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/sspst.pdf

Select Safety Countermeasures Table A1.0

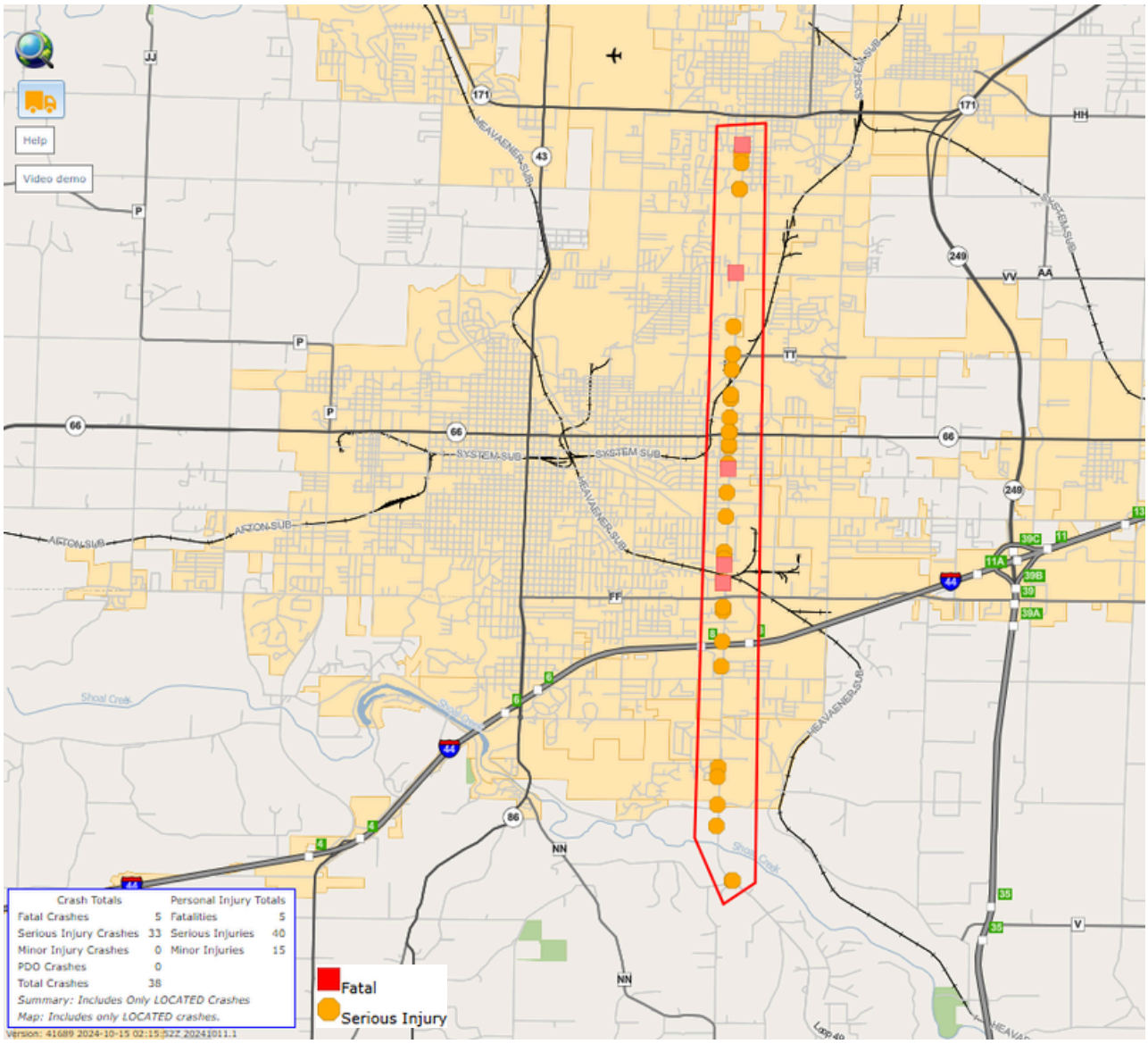
Potential Countermeasures	Where to Apply?	CFR	Cost	Timeline
Convert Signalized Intersection to Roundabout	Signalized intersection with high number of KSI crashes	78% KSI Crashes	$$-$$$	Long-term
Backplates with Retroreflective Borders	Signalized intersections to improve the conspicuity of traffic signals for drivers to reduce KSI crashes	15%	$	Near-term
Traffic Signal Timing and Positive Offset Left Turn Lanes	Intersections with high left-turn volumes or a history of left-turn crashes.	10%-57%	$$	Mid-term
Speed Management (Road Diets & Traffic Calming)	Corridors with high KSI crashes	19%-47%	$$-$$$	Mid-term
Lighting Enhancements	Interchanges, ramps, and pedestrian-prone areas to improve visibility and reduce KSI crashes	28%-48%	$$	Mid-term
Educational Campaigns (Focus Areas)	JATSO Wide Initiative (utilizing MCRS Safety Materials) to reduce all crashes	5%-10%	$	Near-term
High-Visibility Crosswalks	Intersections and arterial corridors to reduce KSI crashes	23%-48%	$	Mid-term
Pedestrian Hybrid Beacons (PHBs)	Intersections and arterial corridors (with speed limits greater than 35 mph)	55%	$$	Mid-term
Pedestrian Overpasses/Underpasses	Major roads with high pedestrian volumes and/or KSI crashes	90%	$$$	Long-term
Median Barrier	Areas identified as "hot spots" based on historical head-on crash data should be prioritized for median barrier installation	50%	$$	Mid-term to Long-term
Road Safety Audits	Existing streets with a history of KSI crashes	10%-60%	$	Near-term
Complete Streets Improvements	Streets with high pedestrian and bicycle activity, especially in downtowns or near schools, parks, and transit stations.	10%-75%	$-$$$	Mid-term to Long-term

I-44 - Potential Safety Countermeasures



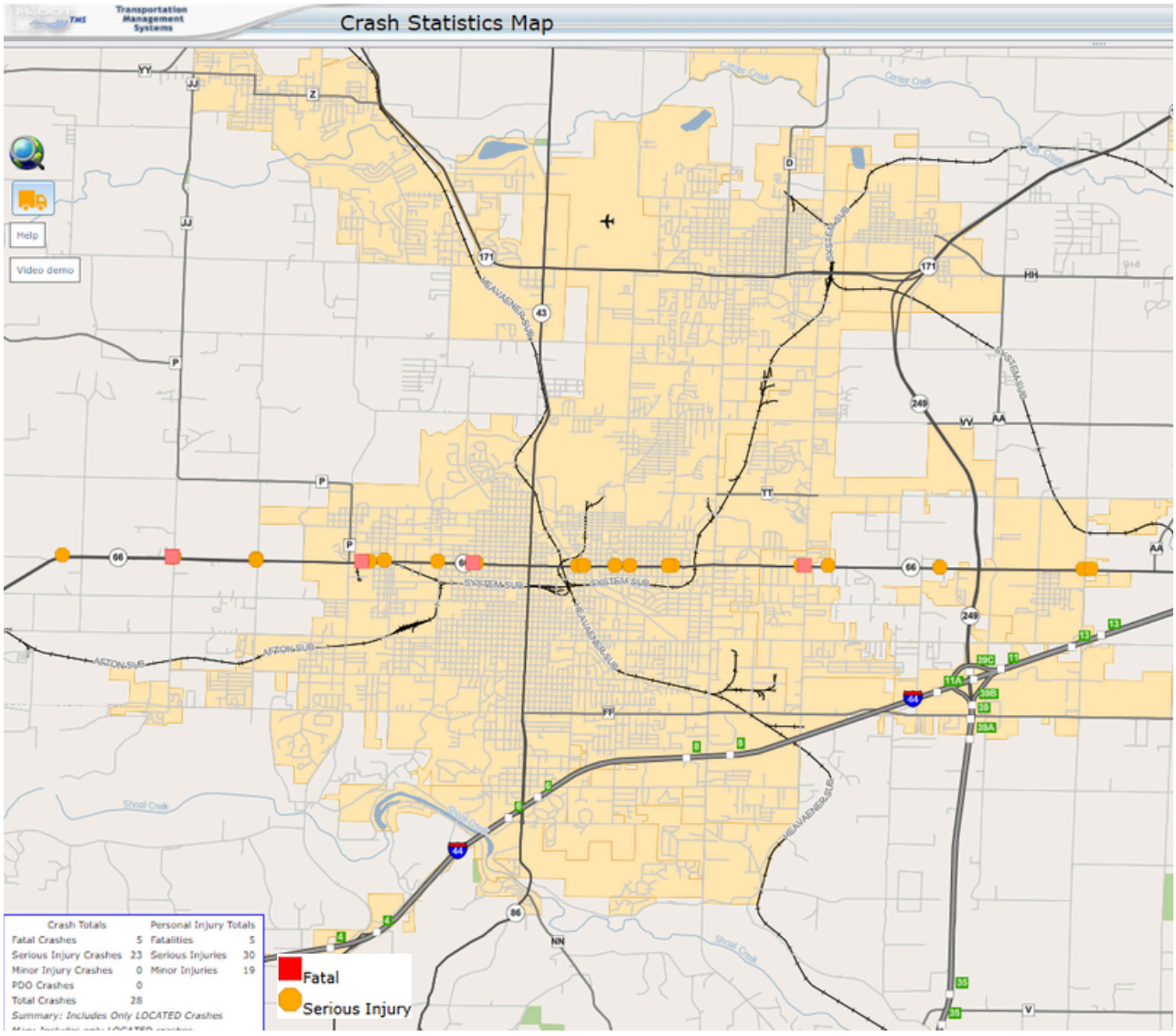
Crash Type	COUNTERMEASURE	DESCRIPTION
Out of Control Crashes	Speed Management	Reduce speed limits from 70mph to 60mph along high-crash segments and enforce compliance
Pedestrian Crashes	Pedestrian Safety Improvements	Install fencing to deter unsafe pedestrian crossings and construct pedestrian grade-separated crossing near areas with high foot traffic to prevent fatalities
Rear-End Crashes	Ramp Safety Enhancements	Extend acceleration and deceleration lanes, improve ramp signage, and add high-friction surface treatments
Pedestrian Crashes	Lighting Enhancements	Upgrade lighting at interchanges, ramps, and pedestrian-prone areas to improve visibility and reduce severe crashes

LP49 (Range Line) - Potential Safety Countermeasures



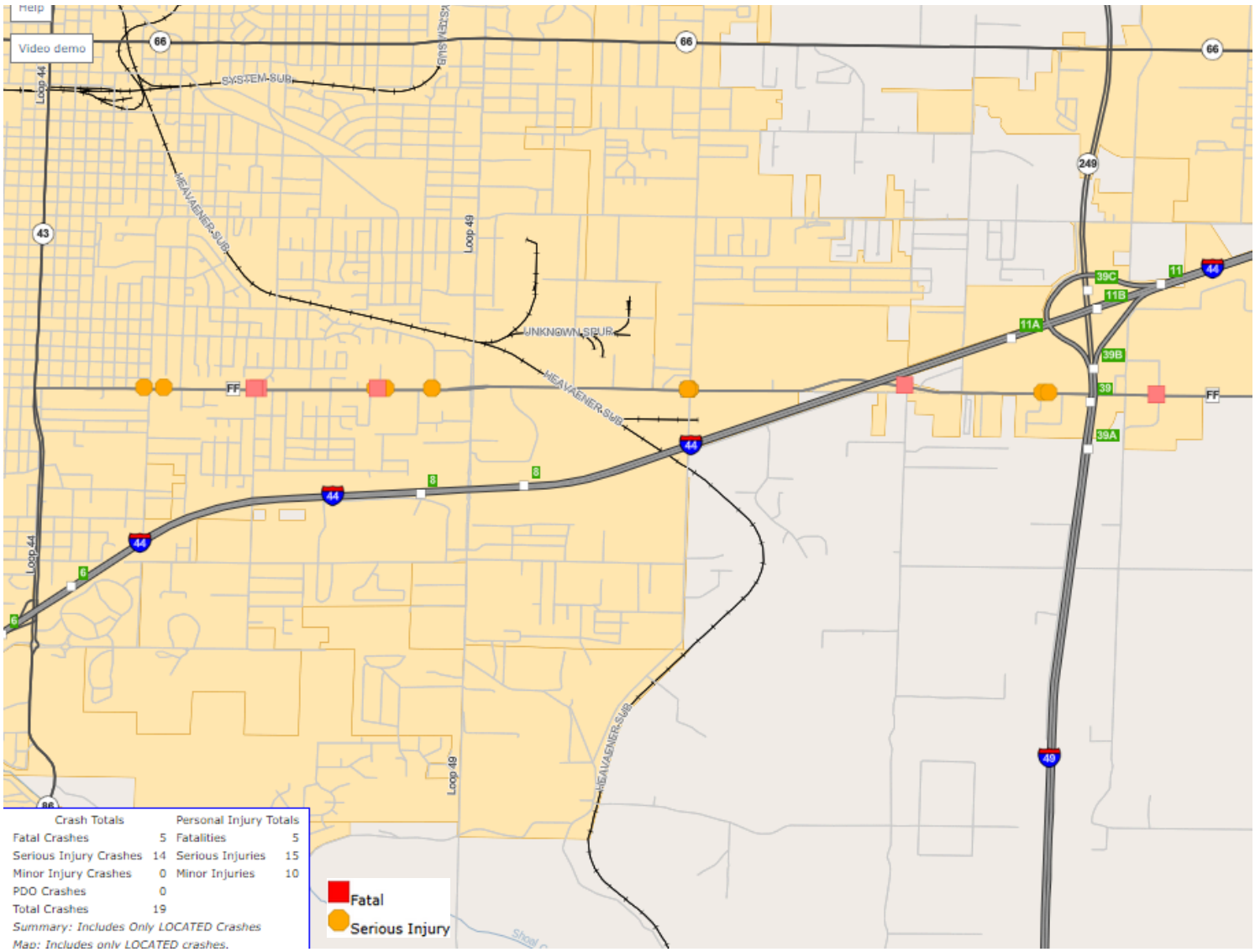
CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Intersection Crashes	**Retroreflective Backplates on Traffic Signals**	Install retroreflective borders on traffic signal backplates at all intersections to improve signal visibility
Speed Related Crashes	**Speed Management and Road Diet**	Narrow travel lanes and reduce posted speed limit.
Turning Movement Crashes	**Traffic Signal Timing and Offset Left**	Optimize signal timing and make protected-only or positive offset left turns at intersections
Pedestrian and Bicycle Collisions	**Pedestrian and Cyclist Safety Enhancements**	Improve pedestrian crossings with refuge islands and crossing signals. Protected Bike Lanes or separated multi-use path

MO66 - Potential Safety Countermeasures



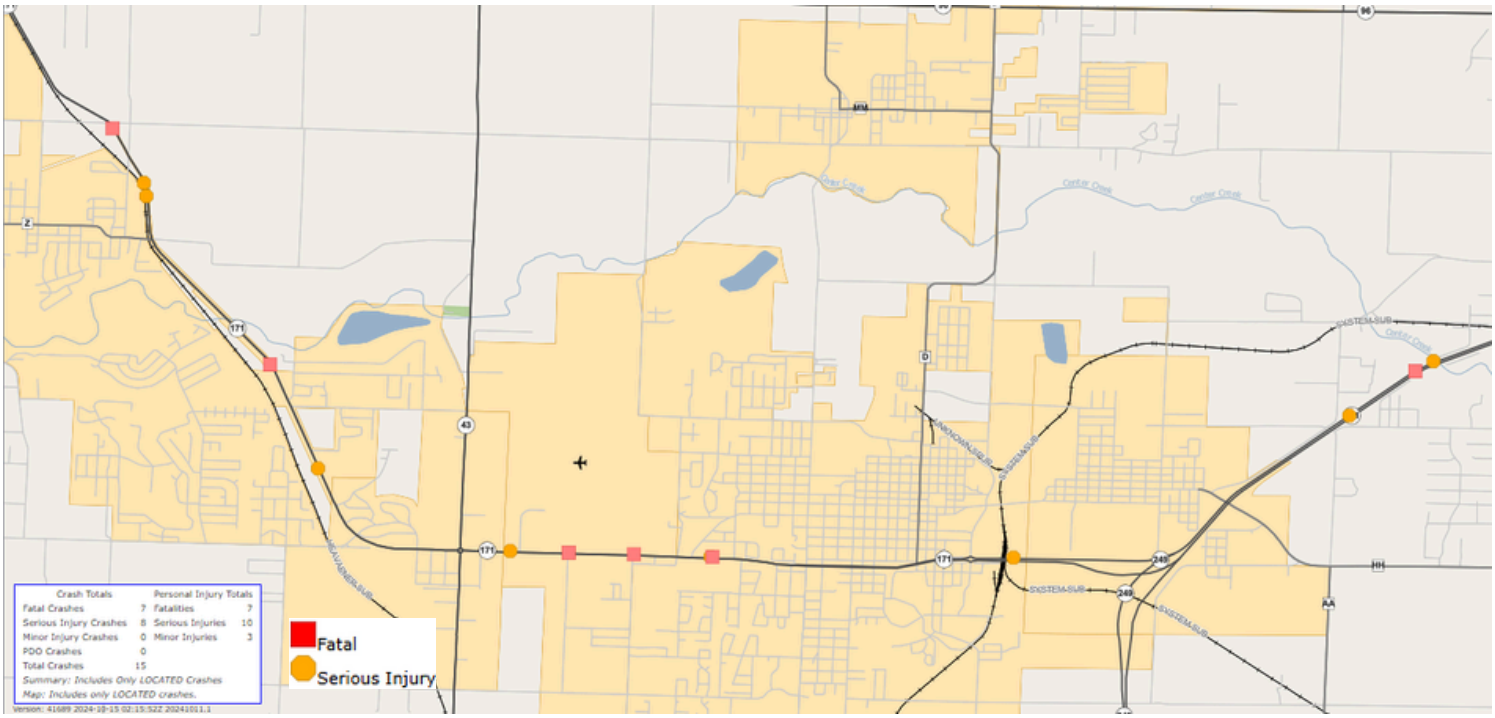
CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Intersection Crashes	**Retroreflective Backplates on Traffic Signals**	Install retroreflective borders on traffic signal backplates at all intersections to improve signal visibility
Speed Related Crashes	**Speed Management and Road Diet**	Narrow travel lanes and reduce posted speed limit.
Turning Movement Crashes	**Traffic Signal Timing and Offset Left**	Optimize signal timing and make protected-only or positive offset left turns at intersections
Pedestrian and Bicycle Collisions	**Pedestrian and Cyclist Safety Enhancements**	Improve pedestrian crossings with refuge islands and crossing signals. Protected Bike Lanes or separated multi-use path

Rte. FF (32nd Street) - Potential Safety Countermeasures



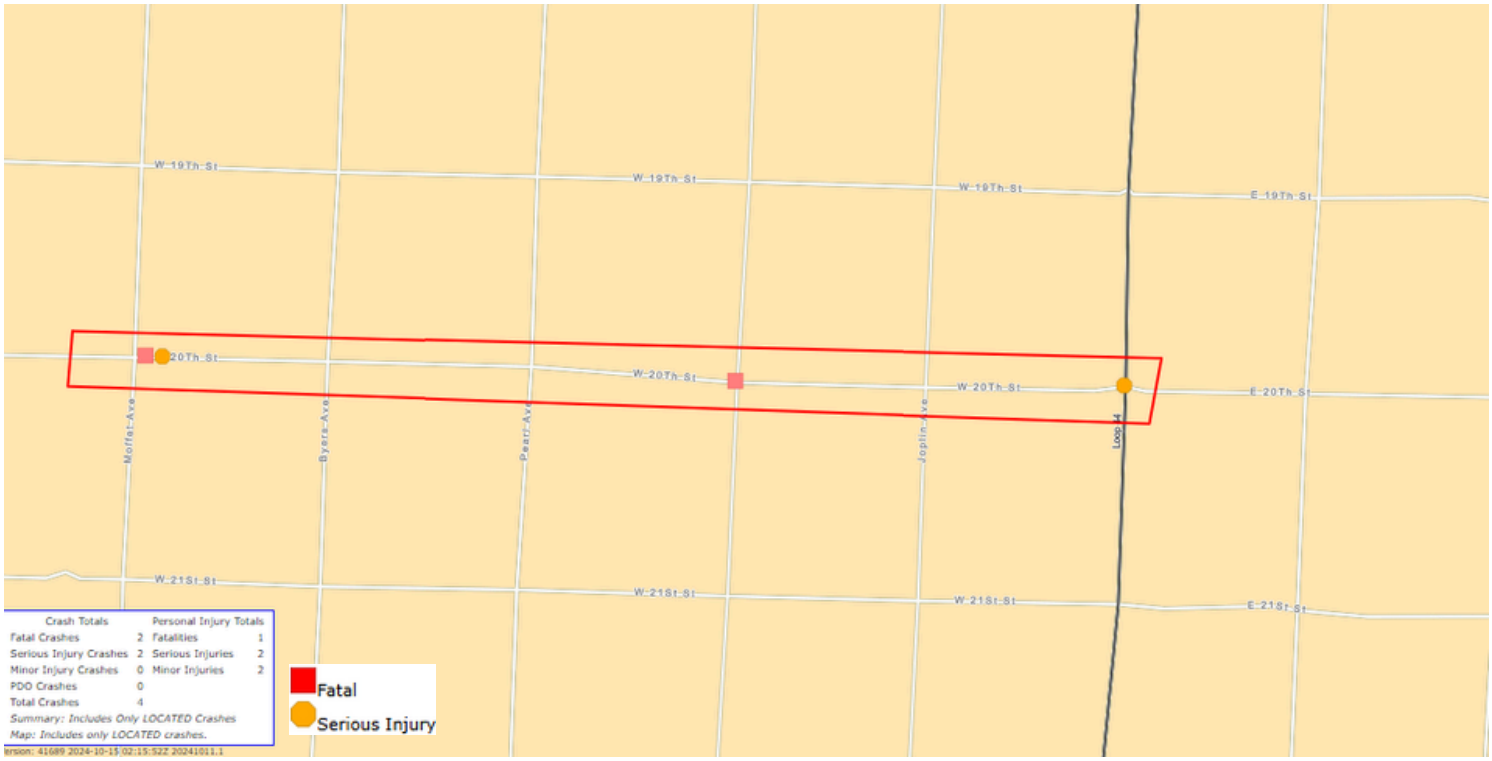
CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Left Turning Crashes	**Left-Turn Signalization and Protected Movements**	Designated left-turn lanes, positive off-set left turn lanes, protected left-turn phase
Speed Related Crashes	**Speed Management and Road Diet**	Narrow travel lanes and reduce posted speed limit.
Pedestrian and Bicycle Collisions	**Pedestrian and Cyclist Safety Enhancements**	Improve pedestrian crossings with refuge islands and crossing signals. Protected Bike Lanes or separated multi-use path
Intersection Crashes	**Retroreflective Backplates on Traffic Signals**	Install retroreflective borders on traffic signal backplates at all intersections to improve signal visibility

MO 171- Potential Safety Countermeasures



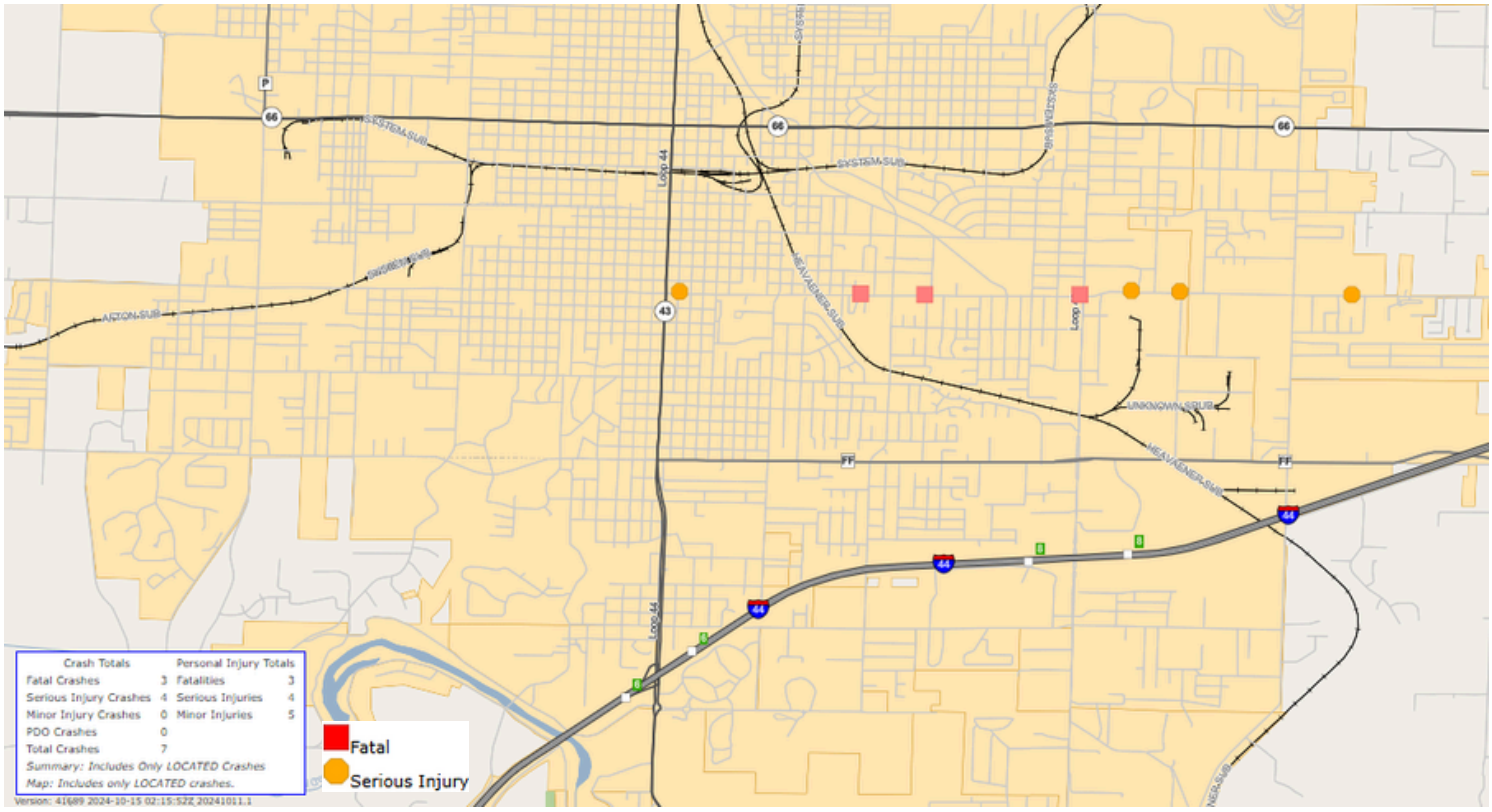
CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Pedestrian Fatalities	**Improved visibility and Pedestrian Education**	Enhance lighting and signage along corridor. Educate public on dangers of walking along highways
Speed Related Crashes	**Speed Management and Road Diet**	Reduced, Consistent Speed Limit along corridor. Narrow lanes where feasible to reduce speed
Lane Departure and Run-Off Road Crashes	**Enhanced Pavement marking and Rumble Strips**	Add rumble strips or rumble stripes along edge and centerlines. Improve visibility of pavement marking and signage

W. 20th Street - Potential Safety Countermeasures



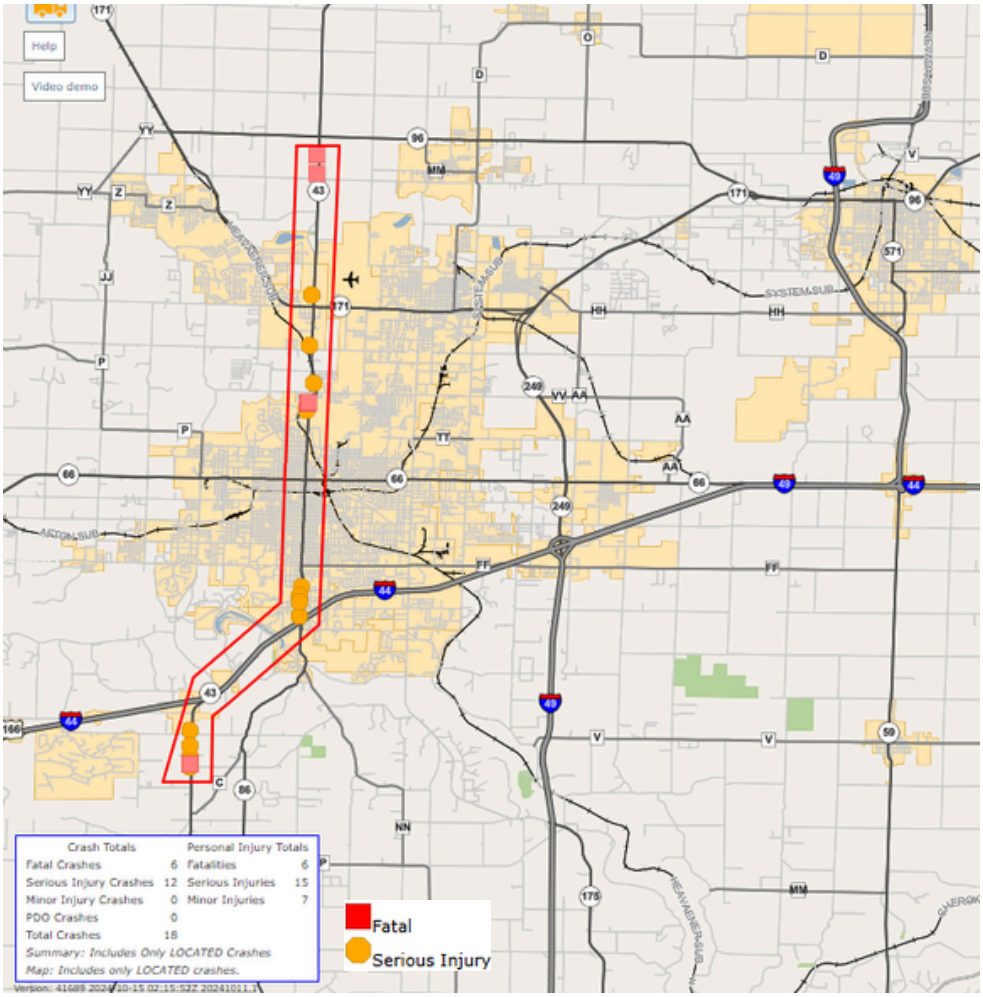
CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Right-Angle Collisions	**Intersection Safety Improvements**	Consider roundabouts, traffic signal timing adjustments, improve signal visibility
Left-Turn Crashes	**Left-Turn Signalization and Protected Movements**	Designated left-turn lanes, positive off-set left turn lanes, protected left-turn phase
Out-of-Control Crashes	**Speed Management**	Consider dynamic speed feedback signs, reduce speed limit

E. 20th Street - Potential Safety Countermeasures



CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Right-Angle Collisions	**Intersection Safety Improvements**	Consider roundabouts, traffic signal timing adjustments, improve signal visibility
Left-Turn Crashes	**Left-Turn Signalization and Protected Movements**	Designated left-turn lanes, positive off-set left turn lanes, protected left-turn phase
Out-of-Control and Speed Related Crashes	**Speed Management and Road Diet**	Narrow travel lanes, consider dynamic speed feedback signs, reduce speed limit
Pedestrian Crashes	**Crossing Infrastructure and Lighting Enhancements**	High visibility crosswalks, refuge islands, and light crossings and locations with high pedestrian volumes
Head-On Crashes	**Barrier or Buffers**	Median barriers or centerline buffer

MO43 (Main Street) - Potential Safety Countermeasures



CRASH TYPE	COUNTERMEASURE	DESCRIPTION
Head On & Rear End Crashes	Speed Management	Apply Road Diet principles in high crash segments to reduce speed and provide space for recovery or pedestrian barriers
Out-of-Control Crashes	High-Friction Surface Treatment	HFST on curves to reduce loss-of-control crashes
Pedestrian Crashes	Crossing Infrastructure and Lighting Enhancements	High visibility crosswalks, refuge islands, and light crossings and locations with high pedestrian volumes
Speed Related Crashes	Speed Management	Reduce speed limits, deploy speed feedback signs
Intersection Crashes	Visibility Enhancements	Enhance signage and lighting at intersections