MEMO

To: Ozarks Transportation Organization

From: Lochmueller Group

Date: September 27, 2024

Subject: OTO Safety Action Plan – Tier 1 Project Evaluations

INTRODUCTION

As part of the comprehensive project list and project prioritization process, 21 tier 1 project locations were identified as the top safety needs throughout the OTO region. This technical memorandum evaluates each of the tier 1 projects and provides recommended safety countermeasures that can address the safety needs of each location.

For each tier 1 project evaluation, an existing conditions overview is provided to illustrate key roadway characteristics such as the number of lanes, daily traffic volumes, speed limits, intersections, pedestrian and bicycle facilities, and adjacent land uses. A crash history (2018-2022) is also provided, detailing the type and severity of crashes at each tier 1 project location. Since tier 1 project locations were identified from the project prioritization process, key items from the prioritization process are shown for each location, including whether the location is on the high injury network (HIN), whether the project is in a disadvantaged community (CEJST), the total number of killed or serious injury (KSI) crashes, and the total priority score. For all data elements used in the prioritization process, see the Implementation Matrix.

Recommendations

Safety countermeasures are recommended based on the context of the location as well as the identified safety problem. In some cases, countermeasures are best implemented together while in other cases, countermeasures reflect options to implement based on funds available, time-frame, or other agency priorities. For each recommendation, additional context and information is provided.

- **Purpose**: The purpose of the recommended safety countermeasure is to address the observed safety need.
- **Benefit**: The expected safety benefits based on national statistics found in FHWA's Proven Safety Countermeasure initiative.
- **Time-frame**: The time-frame to implement a countermeasure based on cost and complexity.
- **Right-of-Way (ROW)**: The expectation that a countermeasure will require additional ROW.
- **Planning Level Cost**: The per unit construction cost of a countermeasure.
- **Quantity**: The unit quantity of a countermeasure recommended at the project location.
- **Estimated Cost**: The estimated cost to construct a countermeasure at the project location.
- **Baseline Estimated Total Cost**: Sum of estimated costs for each countermeasure. This is the baseline construction total not including design, environmental review, ROW, utility coordination, maintenance of traffic, or contingency.

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TIER 1 PROJECT EVALUATIONS

MO-13/Kansas Expressway (Evergreen St to Division St)

Existing Conditions

MO-13/Kansas Expressway from Evergreen Street to Division Street is a 1.5-mile principal arterial/freeway in Springfield, MO. There are two through lanes in each direction and a center median south of Kearney Street and a center turn lane north of Kearney Street. Average daily vehicle traffic is around 25,000 – 30,000 vehicles per day. Sidewalks are disconnected and crossings appear challenging. There are no dedicated bicycle facilities.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Pedestrian	2	5	0	7
Rear end	1	62	96	159
Left turn	1	13	14	28
Out of control	1	12	41	54
Right turn right angle collision	1	6	10	17
Head on	1	5	8	14
Right angle	0	22	22	44
Left turn right angle collision	0	21	12	33
Pedalcycle	0	7	1	8
Passing	0	3	22	25
Sideswipe	0	3	3	6
Right turn	0	2	4	6
Fixed object	0	2	1	3
Other	0	1	2	3
Dual lefts collide	0	1	2	3
Avoiding	0	1	1	2
Changing lane	0	0	2	2
Debris	0	0	1	1
U - turn	0	0	1	1
Total	***7***	***166***	***243***	***416***

Project Prioritization

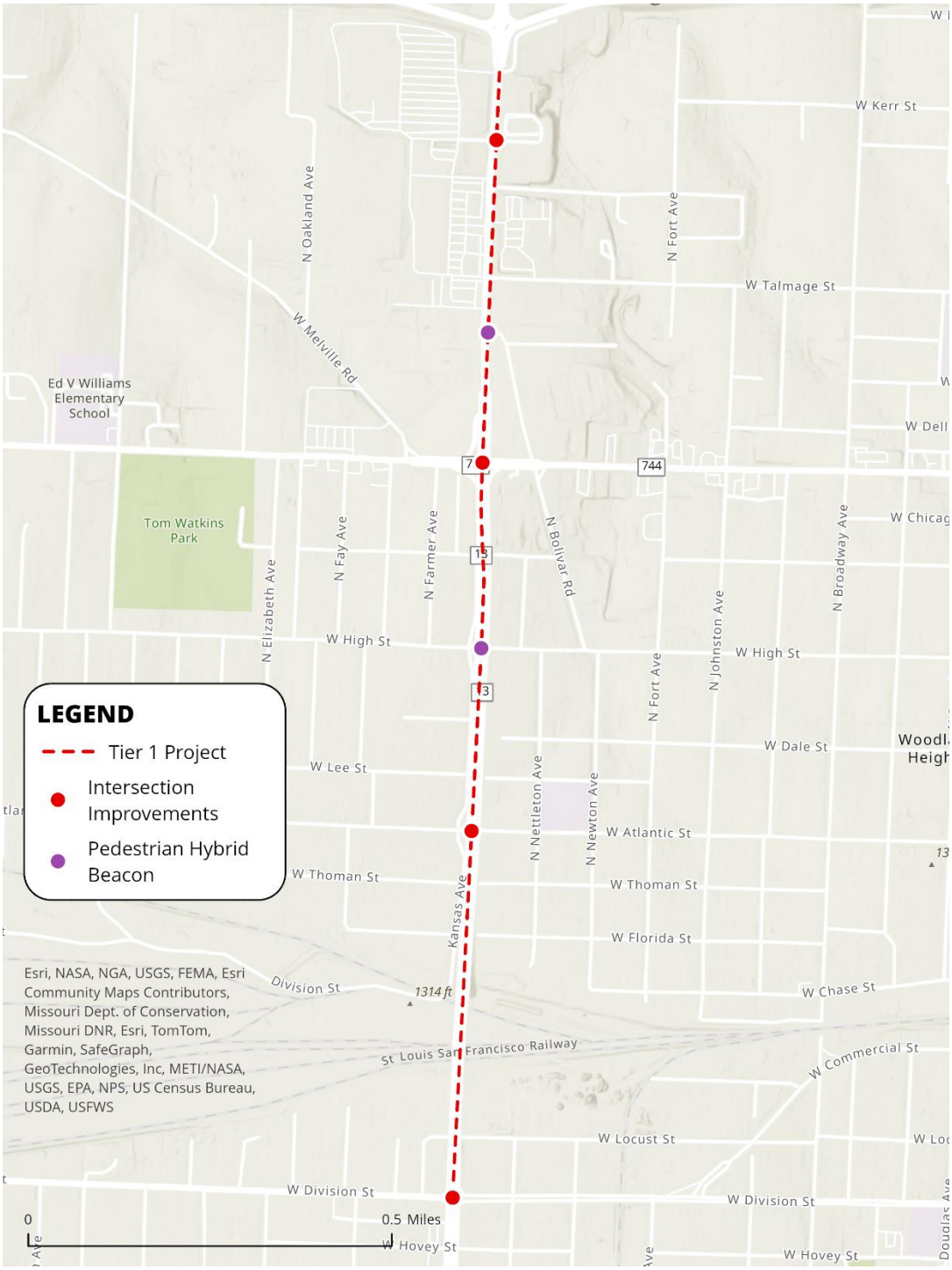
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes	Springfield	Urban	Yes	Yes	No	7	21

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Sidewalks	Reduce pedestrian crashes	65%-89% reduction in pedestrian crashes	Short-term	No	1.3 miles	$370,000 per mile	$481,000
Pedestrian Hybrid Beacons (PHBs)	Reduce pedestrian crashes Reduce vehicle speeds	55% reduction in pedestrian crashes	Short-term	No	2 crossings*	$120,000 each	$240,000
Crosswalk Enhancements	Reduce pedestrian crashes Reduce vehicle speeds	40% reduction in pedestrian crashes	Short-term	No	4 intersections	$25,000 per intersection	$100,000
Pedestrian Refuge Islands	Reduce pedestrian crashes Reduce vehicle speeds	56% reduction in pedestrian crashes	Mid-term	No	8 islands	$115,000 per island	$920,000
Dilemma Zone Detection	Reduce rear end and right-angle crashes	39% reduction in KSI crashes at intersections	Short-term	No	4 signalized intersections	$60,000 per intersection	$240,000
Signal Heads with Retroreflective Backplates	Reduce rear end and right-angle crashes	15% reduction in total crashes	Short-term	No	56 signals	$3,000 per signal	$168,000
Permissive to Protected Left Turn Phase	Reduce left turn and right-angle crashes	--	Short-term	No	4 signalized intersections	$5,000 per intersection	$20,000
Improved Right Turn Angles	Reduce pedestrian crashes Reduce vehicle speeds	--	Mid-term	Yes	8 right turns	$400,000 per right turn	$3,200,000
Corridor Access Management	Reduce pedestrian, rear end, and right-angle crashes	25%-31% reduction in KSI crashes	Long-term	Yes	1.3 miles	--	--
BASELINE ESTIMATED TOTAL							**$5,400,000**

**PHB crossings at High Street and Bolivar Road*

FIGURE 1 - MO-13/KANSAS EXPRESSWAY (EVERGREEN ST TO DIVISION ST)



MO-13/Kansas Expressway (Division St to Chestnut Ex)

Existing Conditions

MO-13/Kansas Expressway from Division Street to Chestnut Expressway is a 0.8-mile divided freeway in Springfield, MO. There are two through lanes in each direction, eight-foot-wide shoulders, and a center median and the speed limit is 40mph. Average daily vehicle traffic is around 15,000 – 20,000 vehicles per day. There are signalized intersections at Division Street, Nicholas Street, and the Chestnut Expressway. There are no sidewalks between Division Street and Nicholas Street; sidewalks are present on the east side south of Nicholas Street. Crossings on foot appear challenging with no dedicated crossings or crosswalks except for those at the signalized intersections. There are no dedicated bicycle facilities, but shared lanes markings are present along Nicholas St. Land use is primarily residential with nearby community features such as Nicholas Park and York Elementary School.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Out of control	3	9	19	31
Pedestrian	2	3	0	5
Left turn right angle collision	1	16	11	28
Left turn	1	8	10	19
Head on	1	6	1	8
Pedalcycle	1	2	1	4
Rear end	0	41	52	93
Right angle	0	24	16	40
Right turn right angle collision	0	4	2	6
Passing	0	2	13	15
Avoiding	0	1	0	1
Other	0	0	3	3
Changing lane	0	0	2	2
Sideswipe	0	0	1	1
Fixed object	0	0	1	1
U - turn	0	0	1	1
Dual lefts collide	0	0	1	1
Total	***9***	***116***	***134***	***259***

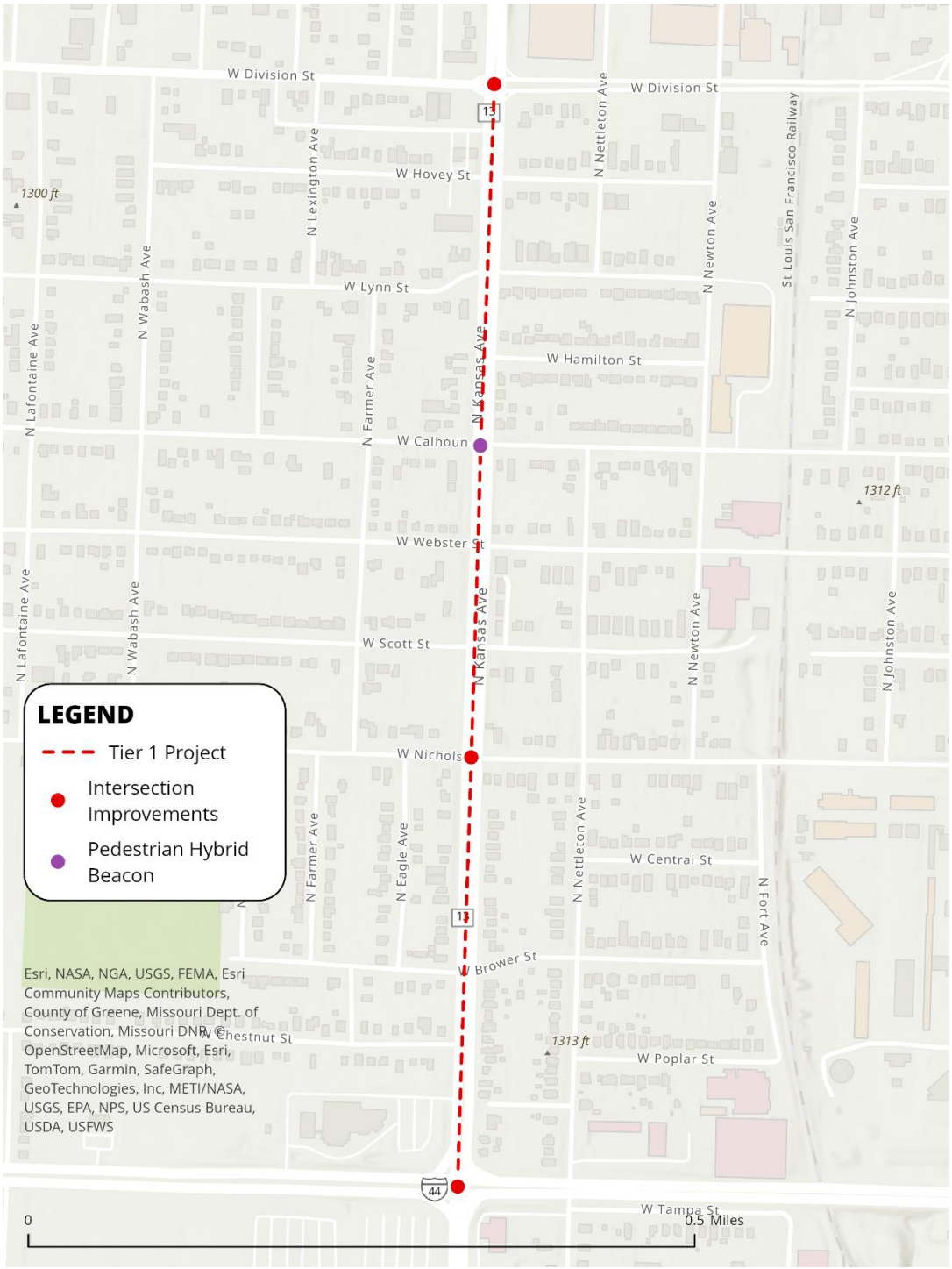
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes	Springfield	Urban	Yes	No	No	9	20

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Sidewalks	Reduce pedestrian crashes	65%-89% reduction in pedestrian crashes	Short-term	No	1 mile	$370,000 per mile	$370,000
Pedestrian Hybrid Beacons (PHBs)	Reduce pedestrian crashes Reduce vehicle speeds	55% reduction in pedestrian crashes	Short-term	No	1 crossing	$120,000 per unit	$120,000
Crosswalk Enhancements	Reduce pedestrian crashes Reduce vehicle speeds	40% reduction in pedestrian crashes	Short-term	No	3 intersections	$25,000 per intersection	$75,000
Pedestrian Refuge Islands	Reduce pedestrian crashes Reduce vehicle speeds	56% reduction in pedestrian crashes	Mid-term	No	6 islands	$115,000 per island	$690,000
Road Diet	Reduce vehicle speeds and out of control crashes Reduce pedestrian and pedalcycle crashes	19%-47% reduction in total crashes	Long-term	No	1.7 miles	$150,000 per mile	$255,000
BASELINE ESTIMATED TOTAL							**$1,500,000**

FIGURE 2 - MO-13/KANSAS EXPRESSWAY (DIVISION ST TO CHESTNUT EX)



MO-13 (Norton Rd to Route WW)

Existing Conditions

This section of MO-13 is a freeway that stretches nearly six miles and is two lanes in each direction separated by a grass median with ten-foot-wide paved shoulders on both sides. Average daily traffic is approximately 20,000 – 25,000 vehicles per day and the speed limit is 65mph. There is one signalized intersection at Norton Road and at-grade stop-controlled intersections at Farm Road 94, Farm Road 88, Little Sac River Road, Route O, and Route WW. Serving rural areas with little commercial or residential development, there are no dedicated bicycle or pedestrian facilities. The Fullbright Springs Greenway crosses the corridor at the Little Sac River near Farm Road 88 with a nearby trailhead on Farm Road 141.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Right angle	4	12	8	24
Out of control	4	6	36	46
Rear end	1	16	49	66
Left turn right angle collision	1	2	3	6
Pedestrian	1	0	0	1
Passing	0	5	19	24
Animal	0	5	8	13
Other	0	2	13	15
Left turn	0	2	0	2
Debris	0	0	9	9
Changing lane	0	0	3	3
Total	***11***	***50***	***148***	***209***

Project Prioritization

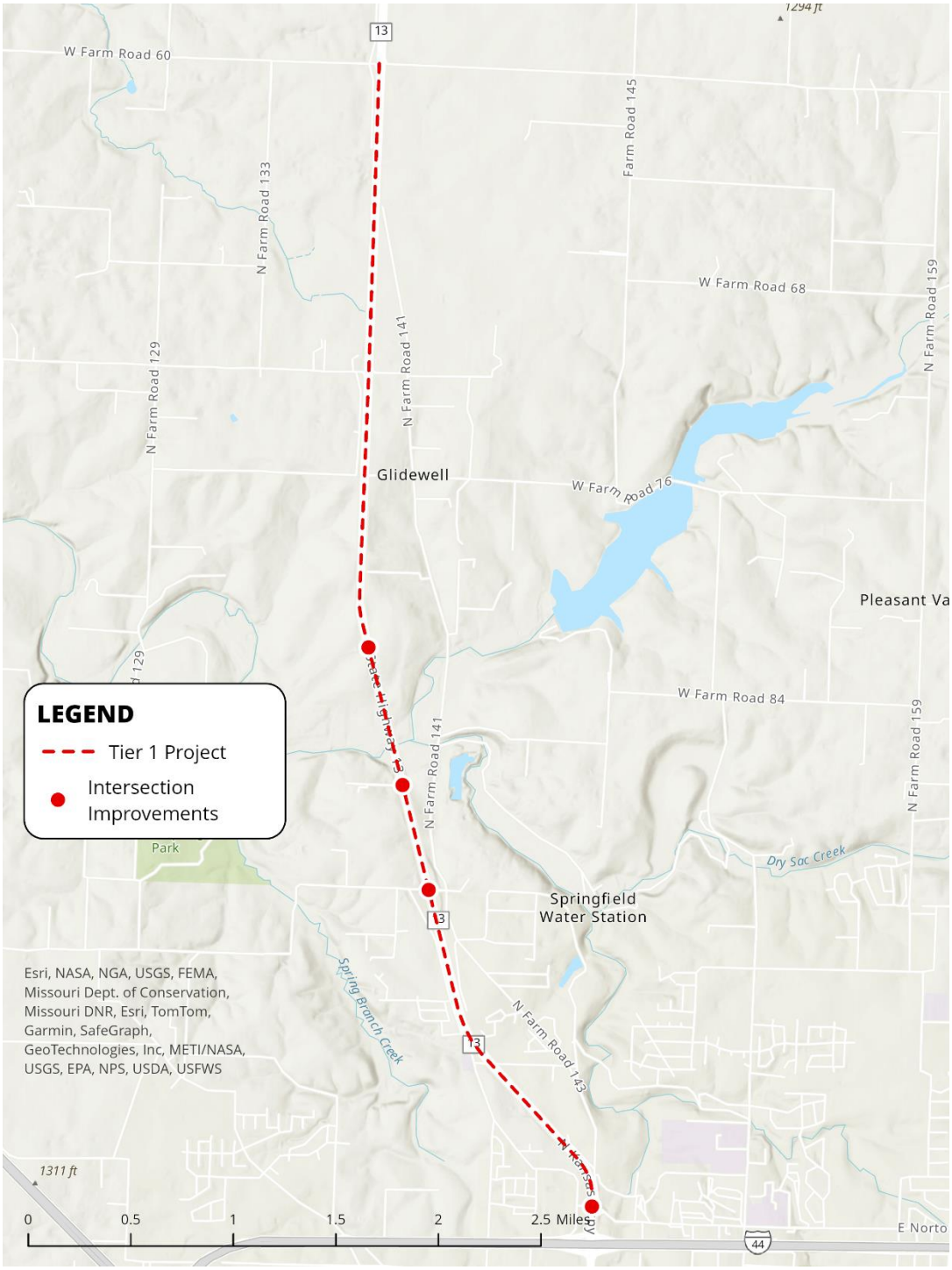
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes	Springfield	Rural	Yes	No	No	11	20

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Intersection Conflict Warning Systems	Reduce right angle crashes	20%-30% reduction in KSI crashes at intersections	Short-term	No	4 intersections	$35,000 per intersection	$140,000
Lighting	Reduce crashes at intersections	28% reduction in injury crashes	Long-term	No	4 intersections	$30,000 per intersection	$120,000
Median barriers	Reduce out of control crashes	97% reduction in cross median crashes	Mid-term	No	5.9 miles	$525,000 per mile	$3,100,000
BASELINE ESTIMATED TOTAL							**$3,400,000**

Reduced Left Turn Conflict Intersections have been recently implemented at Route O and Route WW to reduce left turn and right-angle crashes; future evaluations should be performed when more data becomes available.

FIGURE 3 - MO-13/KANSAS EXPRESSWAY (NORTON RD TO ROUTE WW)



MO-13 and Division St Intersection

Existing Conditions

MO-13 is two through lanes with left and right turn lanes in both directions. Division Street is one through lane with left and right turn lanes in each direction. Right-turn lanes on northbound MO-13 and westbound Division Street are channelized slip lanes. Sidewalk connectivity is lacking at the intersection with missing connections along the south leg on MO-13 and west leg on Division Street.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Out of control	2	6	11	19
Pedestrian	2	1	0	3
Left turn right angle collision	1	4	1	6
Pedalcycle	1	2	0	3
Rear end	0	33	32	65
Right angle	0	7	8	15
Right turn right angle collision	0	2	1	3
Left turn	0	1	5	6
Head on	0	1	0	1
Passing	0	0	7	7
Other	0	0	2	2
Right turn	0	0	1	1
Dual lefts collide	0	0	1	1
Backing	0	0	1	1
Sideswipe	0	0	1	1
Total	***6***	***57***	***71***	***134***

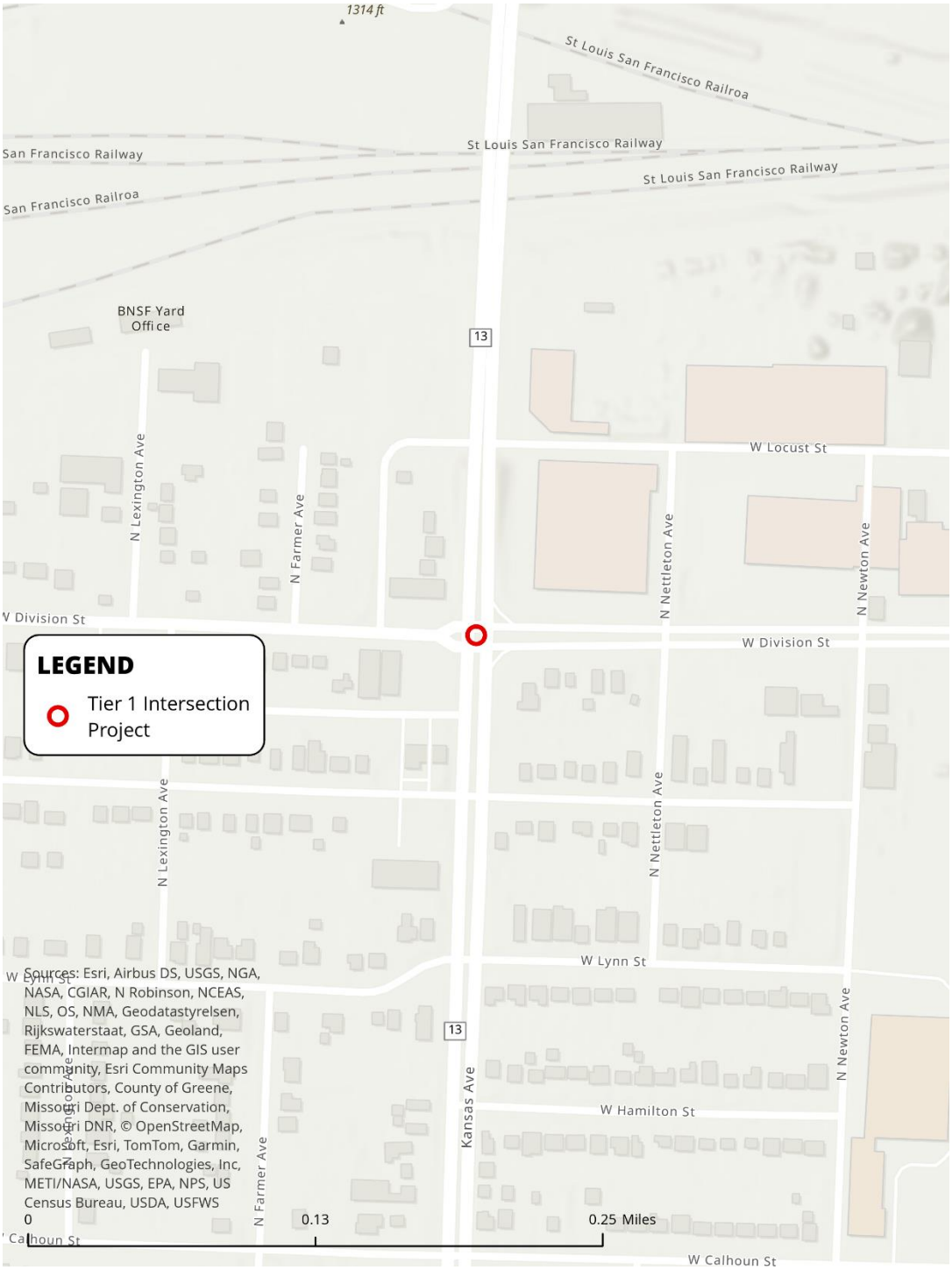
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes	Springfield	Urban	Yes	No	No	6	17

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	1 intersection	$25,000 per intersection	$25,000
Pedestrian Refuge Islands	Reduce pedestrian and out of control crashes	56% reduction in pedestrian crashes	Short-term	No	2 islands	$115,000 per island	$230,000
Dilemma Zone Detection	Reduce rear end and right angle crashes	39% reduction in KSI crashes at intersections	Short-term	No	1 intersection	$60,000 per intersection	$60,000
Signal Heads with Retroreflective Backplates	Reduce rear end and right angle crashes	15% reduction in total crashes	Short-term	No	13 signals	$3,000 per signal	$40,000
Permissive to Protected Left Turn Phase	Reduce left turn and right angle crashes	--	Short-term	No	1 intersection	$5,000 per intersection	$5,000
Improved Right Turn Angles	Reduce pedestrian crashes Reduce vehicle speeds	--	Mid-term	Yes	2 right turns	$400,000 per right turn	$800,000
BASELINE ESTIMATED TOTAL							**$1,200,000**

FIGURE 4 - MO-13 AND DIVISION ST INTERSECTION



Route 14 (14th St to Route W)

Existing Conditions

Route 14 is a two-lane, rural, minor arterial, around 1-mile long, that serves approximately 5,000 – 10,000 vehicles per day. There are no signalized intersections; 14th Street and Route W are side street stop-controlled intersections. The speed limit along the corridor is 45mph. There are no dedicated bicycle or pedestrian facilities, and the adjacent land uses include commercial, light industrial, and residential.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Rear end	1	8	12	21
Left turn right angle collision	0	2	2	4
Left turn	0	2	1	3
Out of control	0	2	1	3
Sideswipe	0	1	1	2
Right angle	0	1	0	1
Animal	0	0	2	2
Passing	0	0	1	1
Head on	0	0	1	1
Total	***1***	***16***	***21***	***38***

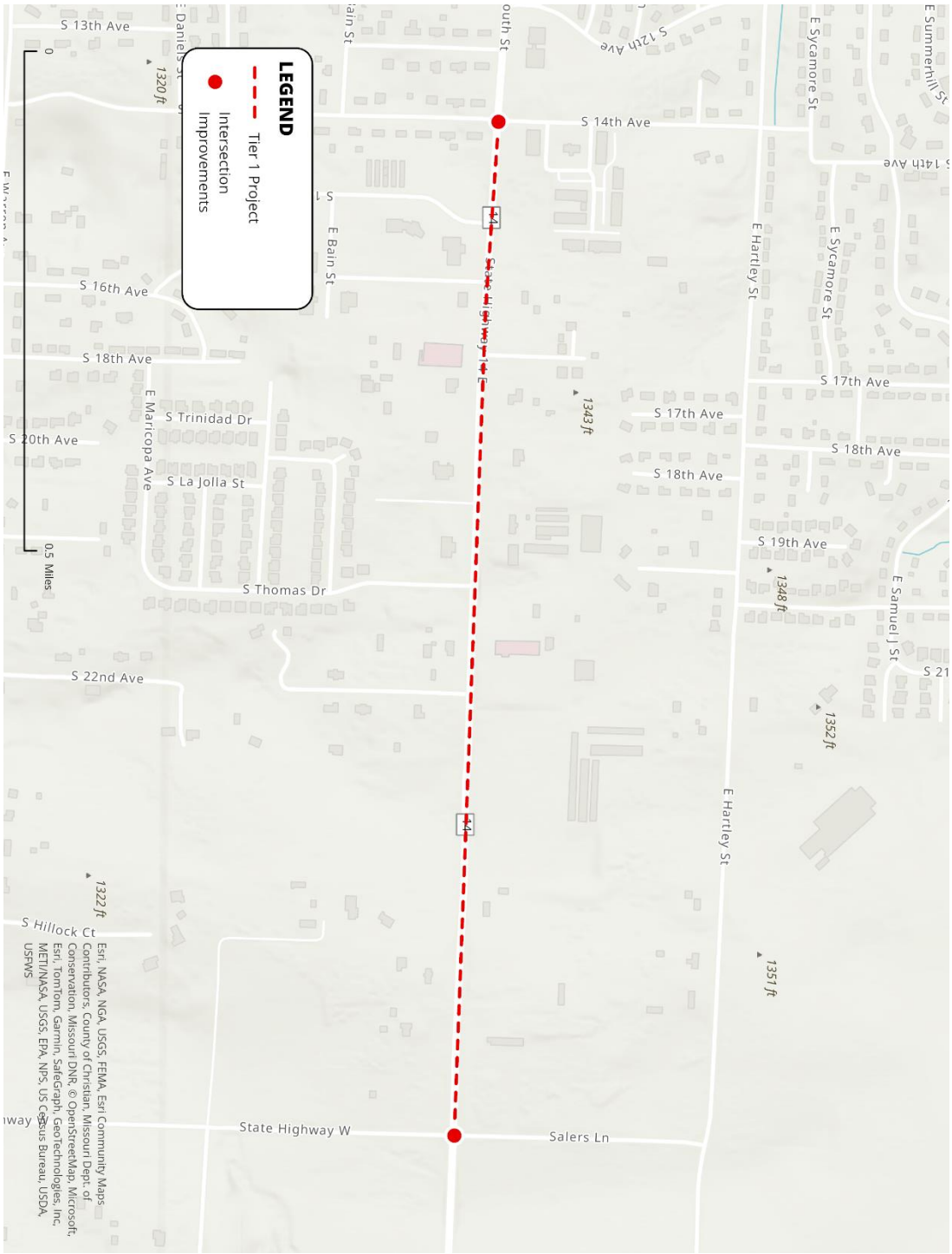
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	No	Ozark	Rural	Yes	No	No	1	7

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Intersection Conflict Warning Systems	Reduce right angle crashes	20%-30% reduction in KSI crashes at intersections	Short-term	No	2 intersections	$35,000 per intersection	$70,000
Lighting	Reduce crashes at intersections	28% reduction in injury crashes	Long-term	No	2 intersections	$30,000 per intersection	$60,000
Systemic Signing & Marking	Reduce rear end and intersection crashes	27% reduction in KSI crashes at rural intersections	Short-term	No	2 intersections	$15,000 per intersection	$30,000
BASELINE ESTIMATED TOTAL							**$160,000**

FIGURE 5 – ROUTE 14 (14TH ST TO ROUTE W)



Route 125 (Route D to US 60)

Existing Conditions

Route 125 is a two-lane, rural, minor arterial, 4.5 miles long, from Route D to US 60. The corridor carries approximately 5,000 vehicles per day. There are no shoulders or bicycle or pedestrian facilities. The speed limit along the corridor is 55mph. The signalized intersection at Route 125 and US 60 is being replaced by a grade separated interchange (completion scheduled for late 2024). There are no other signalized intersections along the corridor. The corridor primarily serves rural residential land uses.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Rear end	2	8	15	25
Out of control	1	5	9	15
Right angle	1	0	4	5
Pedestrian	1	0	0	1
Left turn right angle collision	0	3	5	8
Left turn	0	2	1	3
Passing	0	2	1	3
Right turn right angle collision	0	1	3	4
Head on	0	1	2	3
Pedalcycle	0	1	0	1
Avoiding	0	1	0	1
Other	0	0	1	1
Dual lefts collide	0	0	1	1
Animal	0	0	1	1
Backing	0	0	1	1
Right turn	0	0	1	1
Sideswipe	0	0	1	1
Total	***5***	***24***	***46***	***75***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	No	No	Rogersville	Rural	Yes	No	No	5	12

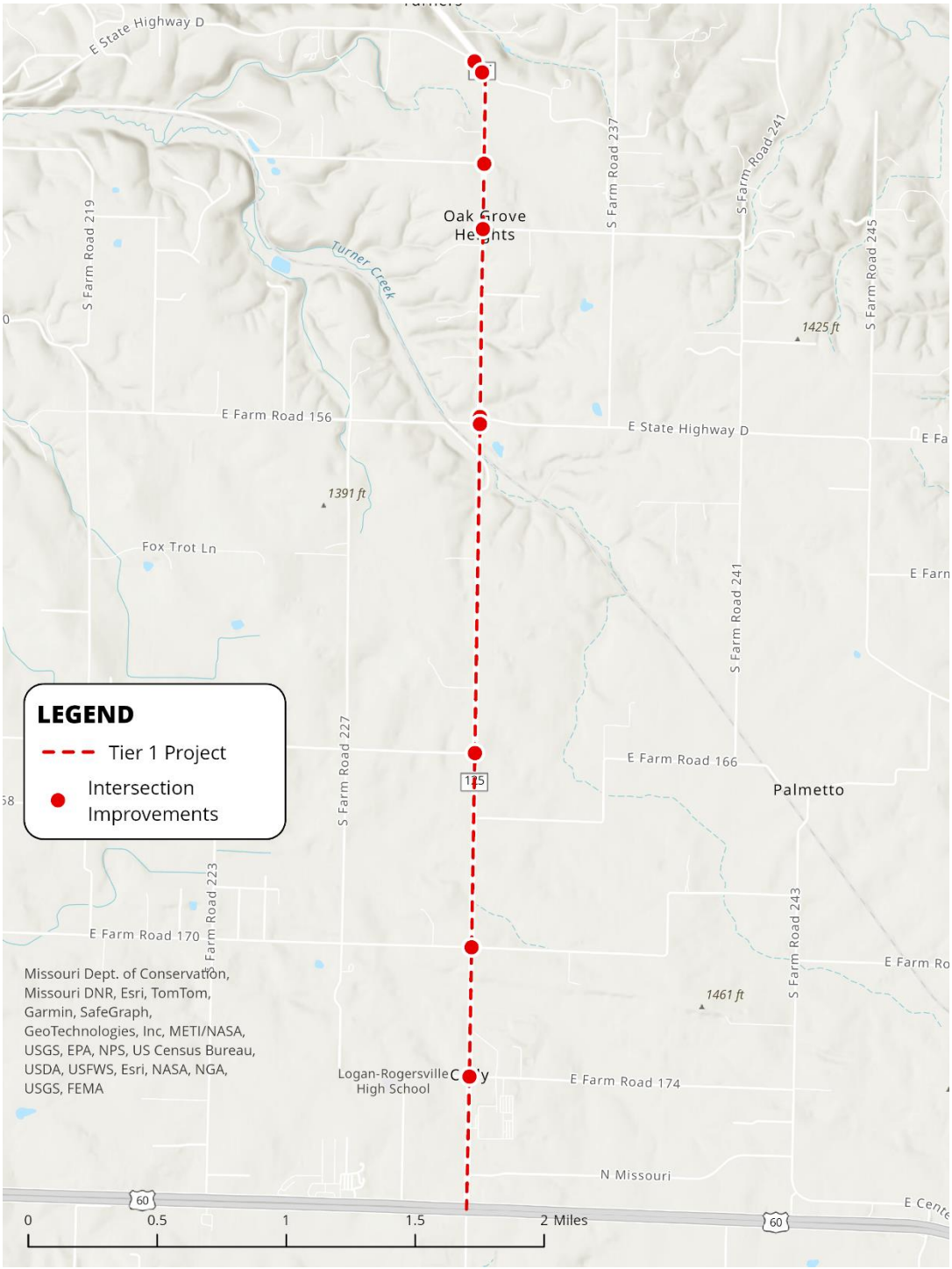
Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Intersection Conflict Warning Systems	Reduce right angle crashes	20%-30% reduction in KSI crashes at intersections	Short-term	No	3 intersections*	$35,000 per intersection	$105,000
Lighting	Reduce crashes at intersections	28% reduction in injury crashes	Long-term	No	3 intersections*	$30,000 per intersection	$90,000
Systemic Signing & Marking	Reduce rear end and intersection crashes	27% reduction in KSI crashes at rural intersections	Short-term	No	9 intersections	$15,000 per intersection	$135,000
Rumble Strips	Reduce out of control crashes	13%-51% reduction in out of control crashes	Short-term	No	4.5 miles	$10,000 per mile	$45,000
BASELINE ESTIMATED TOTAL							**$375,000**

The new interchange at Route 125 and US 60 should be evaluated after completion once data become available.

**Farm Road 174, Farm Road 156, and Route D*

FIGURE 6 – ROUTE 125 (ROUTE D TO US 60)



Kearney St and National Ave Intersection

Existing Conditions

Kearney Street is two through lanes with left turn lanes in each direction. National Avenue is one through lane with left turn lanes in both directions and a right turn lane on the northbound approach. Kearney Street carries approximately 22,000 vehicles per day while National Avenue carries around 10,000 vehicles per day. Sidewalks are present on all approaches however, several objects (utility poles, signal poles, signal boxes, etc.) are located on the sidewalk. Crosswalks appear to be in poor condition with low visibility. There are no dedicated bicycle facilities.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Left turn	3	7	7	17
Head on	1	5	1	7
Out of control	1	1	4	6
Right angle	0	9	3	12
Rear end	0	6	17	23
Passing	0	2	4	6
Left turn right angle collision	0	1	2	3
Pedestrian	0	1	0	1
Total	***5***	***32***	***38***	***75***

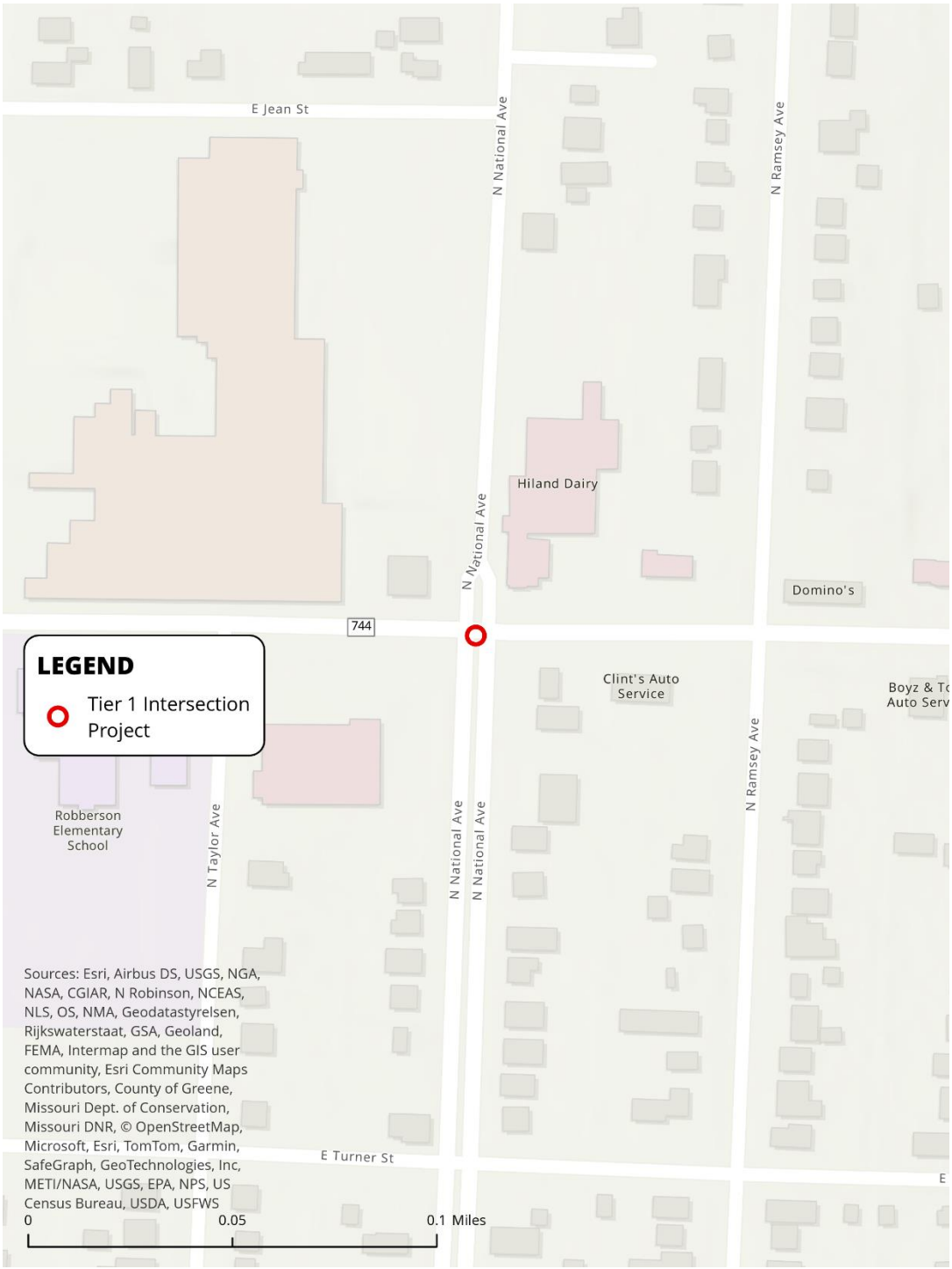
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes	Springfield	Urban	Yes	No	No	5	17

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	1 intersection	$5,000 per intersection	$5,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	1 intersection	$25,000 per intersection	$25,000
Leading Pedestrian Interval	Reduce pedestrian crashes	13% reduction in pedestrian crashes	Short-term	No	1 intersection	$5,000 per intersection	$5,000
Pedestrian Refuge Islands	Reduce pedestrian and out of control crashes	56% reduction in pedestrian crashes	Short-term	No	2 islands	$115,000 per island	$230,000
Signal Heads with Retroreflective Backplates	Reduce rear end and right angle crashes	15% reduction in total crashes	Short-term	No	12 signals	$3,000 per signal	$36,000
Dilemma Zone Detection	Reduce left turn and right angle crashes	--	Short-term	No	1 intersection	$60,000 per intersection	$60,000
BASELINE ESTIMATED TOTAL							**$360,000**

FIGURE 7 – KEARNEY ST AND NATIONAL AVE INTERSECTION



US 160 and Farm Road 123 Intersection

Existing Conditions

Reduced Left Turn Conflict Intersection completed in 2021; not providing recommendations at this time.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Rear end	2	1	4	7
Head on	1	1	0	2
Left turn right angle collision	1	0	0	1
Pedalcycle	0	1	0	1
Out of control	0	0	3	3
Right angle	0	0	1	1
Total	***4***	***3***	***8***	***15***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes		Rural	Yes	No	No	4	11

US 160 (Route 14 to OTO Boundary)

Existing Conditions

This section of US 160 is a principal arterial extending 3.6 miles from Route 14 in Nixa south to the OTO boundary. There is one through lane in each direction and ten-foot-wide paved shoulders. The speed limit is 60mph. US 160 at Route 14 and at South Street (reconstructed in 2021) are the only signalized intersections along the corridor. Other major intersections include left turn lanes at Sunrise Drive, Rosedale Road, Kelby Parkway, S Main Street, and Pawnee Road. The corridor carries approximately 5,000 vehicles per day.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Rear end	4	20	76	100
Left turn right angle collision	3	6	5	14
Out of control	2	7	17	26
Left turn	1	3	3	7
Sideswipe	1	1	0	2
Avoiding	1	1	0	2
Right angle	0	4	8	12
Head on	0	3	5	8
Animal	0	1	12	13
Right turn right angle collision	0	1	4	5
Passing	0	0	13	13
Debris	0	0	4	4
Other	0	0	3	3
Fixed object	0	0	2	2
Right turn	0	0	1	1
Changing lane	0	0	1	1
Total	***12***	***47***	***154***	***213***

Project Prioritization

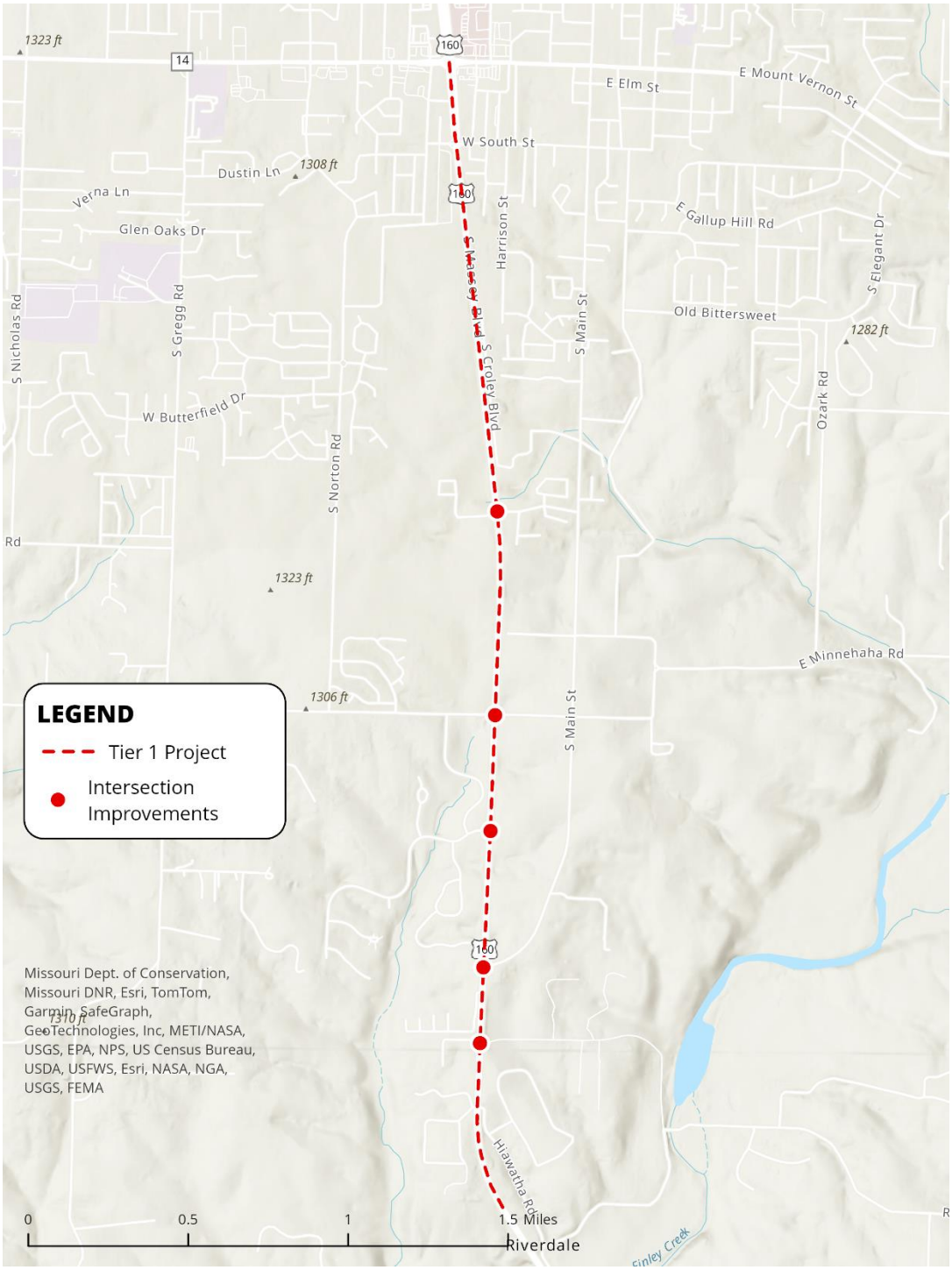
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	No	Nixa	Rural	Yes	No	No	12	20

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Intersection Conflict Warning Systems	Reduce right angle and rear end crashes	20%-30% reduction in KSI crashes at intersections	Short-term	No	5 intersections	$35,000 per intersection	$175,000
Lighting	Reduce crashes at intersections	28% reduction in injury crashes	Long-term	No	5 intersections	$30,000	$150,000
Systemic Signing & Marking	Reduce rear end and intersection crashes	27% reduction in KSI crashes at rural intersections	Short-term	No	5 intersections	$15,000 per intersection	$75,000
Rumble Strips	Reduce out of control crashes	13%-51% reduction in out of control crashes	Short-term	No	3.6 miles	$10,000 per mile	$36,000
Reduced Conflict Left Turn Intersections	Reduce left turn and right angle crashes	63% reduction in KSI crashes	Long-term	Yes	2 intersections*	$1,000,000 per intersection	$2,000,000
BASELINE ESTIMATED TOTAL							**$2,400,000**

**Rosedale Road and Main Street*

FIGURE 8 – US 160 (ROUTE 14 TO OTO BOUNDARY)



Route AB (US 160 to Route EE)

Existing Conditions

Route AB is a major collector with one lane in each direction and narrow shoulders stretching 4 miles from US 160 to Route AB. The route carries approximately 2,500 vehicles per day and has a speed limit of 55 mph. There is a signalized intersection at US 160 and a four-way stop controlled intersection at Route EE. Land use along the corridor is rural residential and agricultural with some suburban residential developments near US 160 in Willard, MO. There are no dedicated bicycle or pedestrian facilities.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Right angle	1	6	11	18
Out of control	1	5	14	20
Rear end	1	4	8	13
Sideswipe	1	0	1	2
Other	1	0	0	1
Left turn right angle collision	0	1	5	6
Avoiding	0	1	0	1
Animal	0	0	9	9
Left turn	0	0	4	4
Passing	0	0	3	3
Debris	0	0	1	1
U - turn	0	0	1	1
Head on	0	0	1	1
Total	***5***	***17***	***58***	***80***

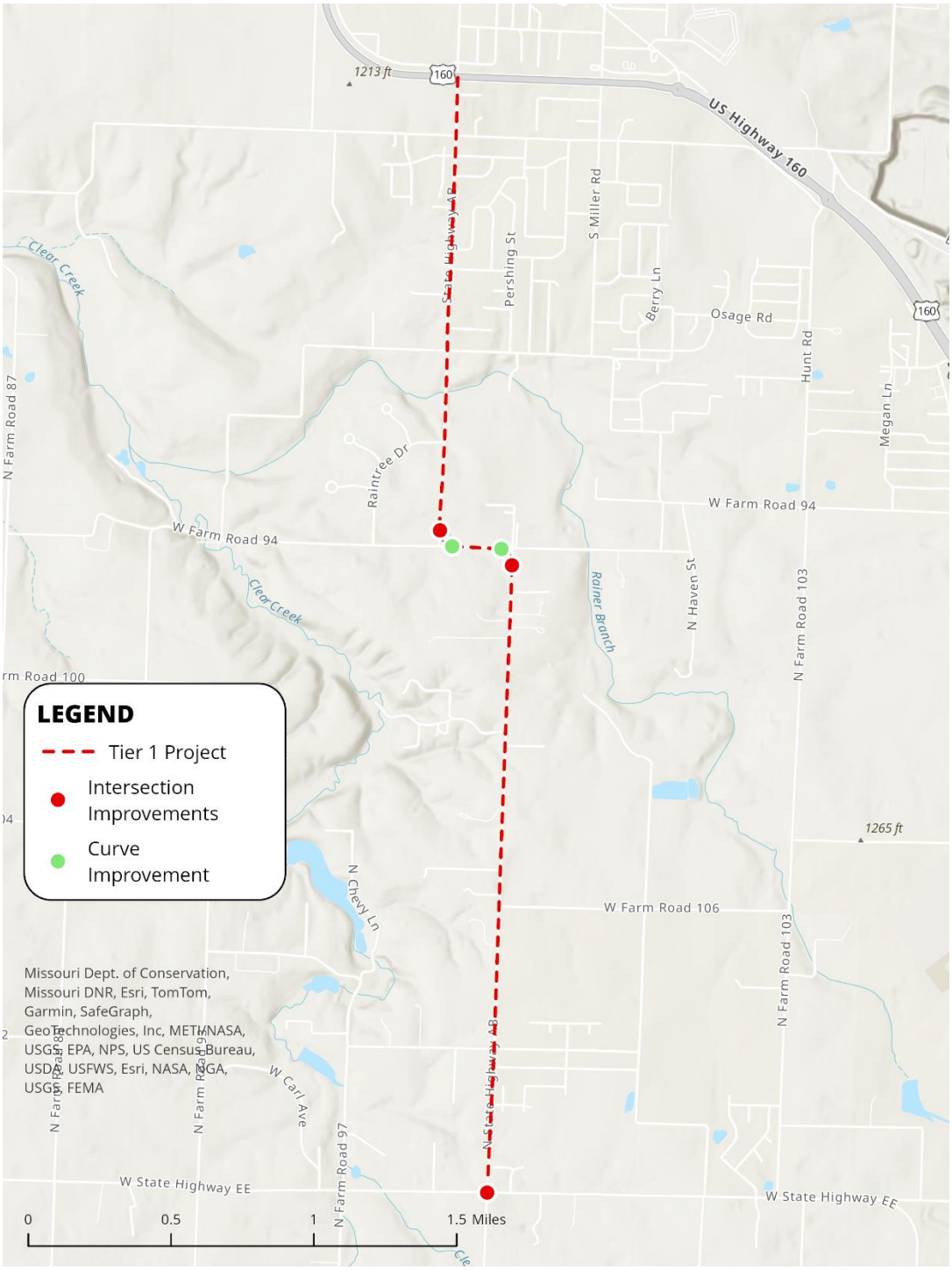
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	No	No	Willard	Rural	Yes	No	No	5	11

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Intersection Conflict Warning Systems	Reduce right angle and rear end crashes	20%-30% reduction in KSI crashes at intersections	Short-term	No	3 intersections	$35,000 per intersection	$105,000
Lighting	Reduce crashes at intersections	28% reduction in injury crashes	Long-term	No	3 intersections	$30,000 per intersection	$90,000
Systemic Signing & Marking	Reduce rear end and intersection crashes	27% reduction in KSI crashes at rural intersections	Short-term	No	3 intersections	$15,000 per intersection	$45,000
Rumble Strips	Reduce out of control crashes	13%-51% reduction in out of control crashes	Short-term	No	4 miles	$10,000 per mile	$40,000
Curve Improvements – Signs and markings	Reduce out of control crashes	--	Short-term	No	2 curves	$35,000 per curve	$70,000
Curve Improvements – Radius Improvement	Reduce out of control crashes	--	Long-term	Yes	2 curves	$1,500,000 per curve	$3,000,000
BASELINE ESTIMATED TOTAL							**$3,400,000**

FIGURE 9 – ROUTE AB (US 160 TO ROUTE EE)



Route CC (US 160 to US 65)

Existing Conditions

Route CC is a minor arterial, 4.5 miles long, from US 160 to US 65 spanning the communities of Nixa, Fremont Hills, and Ozark. The corridor is one lane in each direction with narrow shoulders and has a speed limit of 45 mph. Approximately 12,000 – 18,000 vehicles per day use the facility which provides access to various land uses such as suburban residential neighborhoods, commercial uses, and schools. Intersections at US 160, Cedar Street, Cheyenne Road, Fremont Road, and 22nd Street are signalized. The intersection at US 65 is a diverging diamond interchange (DDI) completed in 2016. There are sidewalks on the south side of Route CC between 22nd Street and US 65 and a 0.15-mile disconnected walkway/shared use path just west of Fremont Road.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Head on	4	5	3	12
Rear end	3	29	118	150
Out of control	2	16	25	43
Left turn right angle collision	1	4	14	19
Right angle	1	2	7	10
Left turn	0	9	18	27
Animal	0	2	4	6
Passing	0	1	22	23
Right turn right angle collision	0	1	12	13
Pedestrian	0	1	0	1
Sideswipe	0	0	6	6
Right turn	0	0	4	4
Changing lane	0	0	3	3
Debris	0	0	2	2
Other	0	0	2	2
Avoiding	0	0	1	1
Total	***11***	***70***	***241***	***322***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	No	Nixa Fremont Hills Ozark	Urban	Yes	No	No	11	20

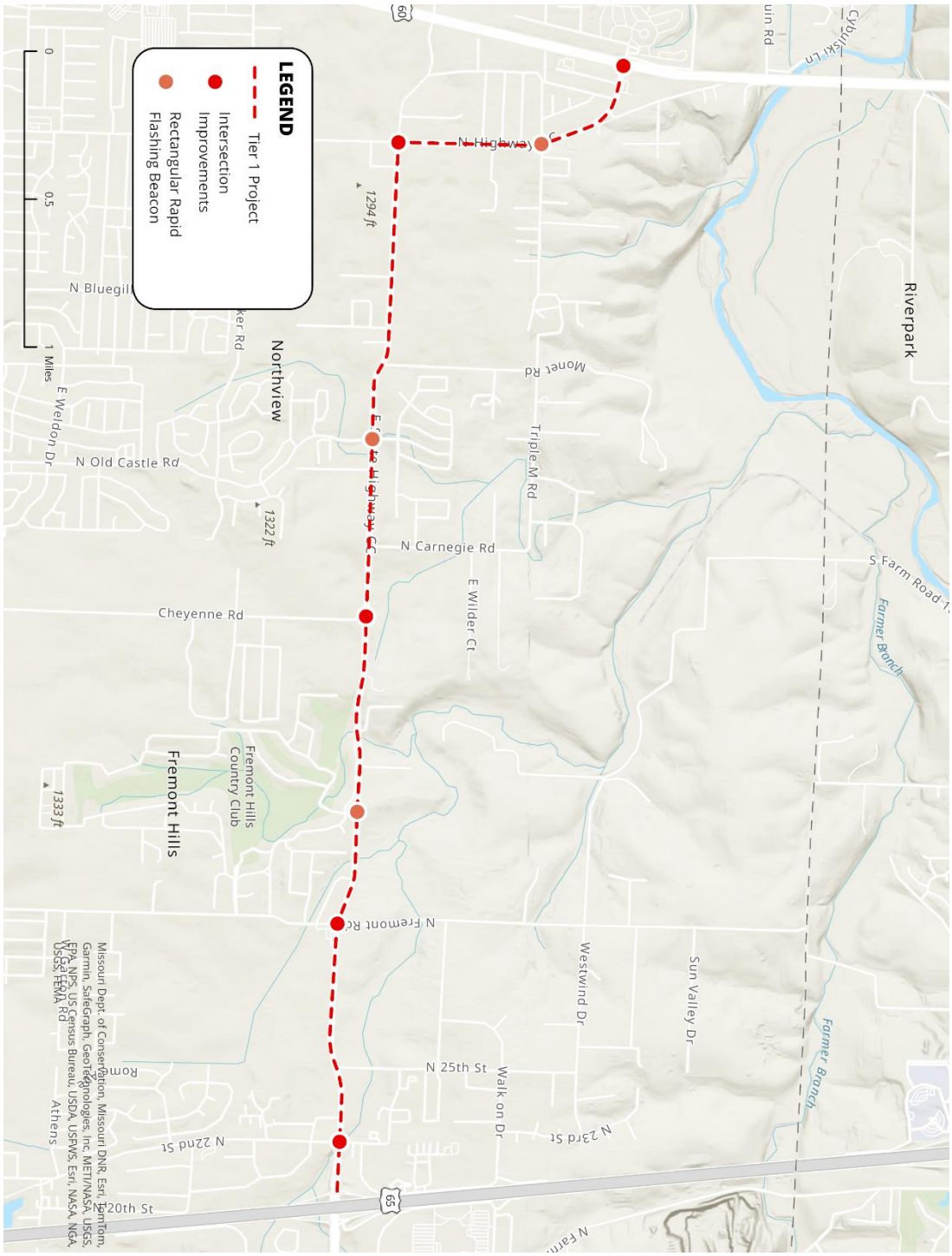
Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Shared Use Path	Reduce bicycle and pedestrian crashes	--	Mid-term	Yes	4.5 miles	$700,000 per mile	$3,150,000
Rectangular Rapid Flashing Beacons	Reduce pedestrian and speed related crashes	47% reduction in pedestrian crashes	Short-term	No	3 crossings*	$25,000 each	$75,000
Crosswalk Enhancements	Reduce pedestrian and speed related crashes	40% reduction in pedestrian crashes	Short-term	No	5 intersections	$25,000 per intersection	$125,000
BASELINE ESTIMATED TOTAL							**$3,400,000**

Project on STIP priority list to include sidewalk and trail improvements only

**Sycamore Street/Lindbergh Road, Old Castle Road, Rolling Hills Drive*

FIGURE 10 – ROUTE CC (US 160 TO US 65)



Route FF (Republic Rd to Weaver Rd)

Existing Conditions

Route FF is a 1-mile divided minor arterial with a grass median and two through lanes in each direction from Republic Road to Farm Road 123. South of Farm Road 123 to Weaver Road, Route FF is one through lane in each direction with a center turn lane. The corridor carries around 5,000 vehicles per day and the speed limit is 55 mph. The intersection at Republic Road is the only signalized intersection. Route FF is a signed bike route, but no dedicated facilities are available for bicyclists or pedestrians. Land uses in the area include suburban residential, commercial uses, schools, and a senior living community.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Right angle	2	5	9	16
Left turn	2	3	5	10
Out of control	1	2	4	7
Left turn right angle collision	1	0	3	4
Rear end	0	3	33	36
Head on	0	2	4	6
Other	0	1	0	1
Passing	0	0	5	5
Animal	0	0	5	5
Fixed object	0	0	2	2
Right turn	0	0	1	1
Right turn right angle collision	0	0	1	1
Total	***6***	***16***	***72***	***94***

Project Prioritization

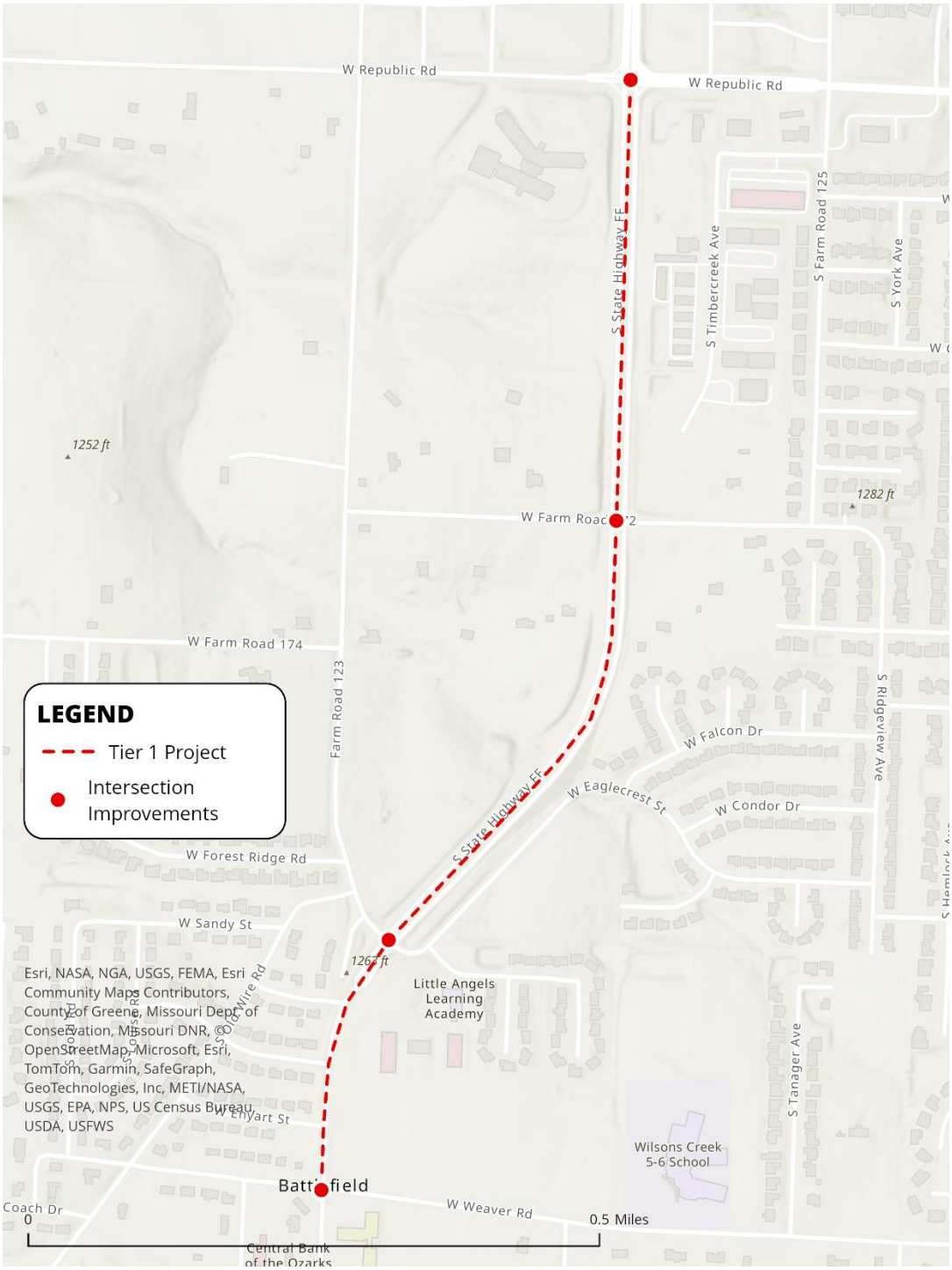
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	No	Battlefield	Urban	Yes	No	No	6	16

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Shared Use Path	Reduce bicycle and pedestrian crashes	--	Mid-term	Yes	1 mile	$700,000 per mile	$700,000
Rectangular Rapid Flashing Beacons	Reduce pedestrian and speed related crashes	47% reduction in pedestrian crashes	Short-term	No	2 crossings	$25,000 each	$50,000
Pedestrian Hybrid Beacons	Reduce pedestrian and speed related crashes	55% reduction in pedestrian crashes	Short-term	No	2 crossings	$120,000 each	$240,000
Crosswalk Enhancements	Reduce pedestrian and speed related crashes	40% reduction in pedestrian crashes	Short-term	No	4 intersections	$25,000 per intersections	$100,000
BASELINE ESTIMATED TOTAL							**$390,000**

Project on STIP priority list to include pedestrian improvements only

FIGURE 11 – ROUTE FF (REPUBLIC RD TO WEAVER RD)



Glenstone Ave (Valley Water Mill Rd to Evergreen St)

Existing Conditions

Glenstone Avenue is a principal arterial south of I-44 and a minor arterial north of I-44. The corridor is a 1.2-mile divided expressway with two through lanes in each direction from Evergreen Street to Mcclernon Street. From Mcclernon Street to Valley Water Mill Road, the corridor is one through lane in each direction with a center turn lane. Daily traffic varies from around 11,000 vehicles per day north of I-44 to nearly 24,000 vehicles per day south of I-44. Signalized intersections include Evergreen Street, I-44 on/off ramps, Mcclernon Street, and Valley Water Mill Road. There are no sidewalks south of I-44 and the sidewalks are disconnected north of I-44. There are no dedicated bicycle facilities. Land use is primarily commercial.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Left turn	5	22	22	49
Left turn right angle collision	3	14	14	31
Rear end	1	9	34	44
Pedestrian	1	2	0	3
Head on	0	9	2	11
Out of control	0	8	12	20
Right angle	0	5	9	14
Sideswipe	0	3	3	6
Other	0	2	1	3
Passing	0	1	12	13
U - turn	0	1	2	3
Right turn	0	1	1	2
Pedalcycle	0	1	0	1
Avoiding	0	1	0	1
Right turn right angle collision	0	0	5	5
Total	***10***	***79***	***117***	***206***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
State	Yes	Yes	Springfield	Urban	Yes	No	No	10	20

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Sidewalks	Reduce pedestrian crashes	65%-89% reduction in pedestrian crashes	Short-term	No	2 miles	$370,000 per mile	$740,000
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	5 intersections	$5,000 per intersection	$25,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	5 intersections	$25,000 per intersection	$125,000
Leading Pedestrian Interval	Reduce pedestrian crashes	13% reduction in pedestrian crashes	Short-term	No	5 intersections	$5,000 per intersection	$25,000
Pedestrian Refuge Islands	Reduce pedestrian and out of control crashes	56% reduction in pedestrian crashes	Mid-term	No	10 islands	$115,000 per island	$1,150,000
BASELINE ESTIMATED TOTAL							**$2,100,000**

Project on STIP priority list to include pedestrian improvements only

FIGURE 12 – GLENSTONE AVE (VALLEY WATER MILL RD TO EVERGREEN ST)

Grant Ave (College St to Kearney St)

Existing Conditions

Grant Avenue is a 2.2-mile minor arterial with one through lane in each direction with a center turn lane. The corridor runs from College Street in Downtown Springfield north to Kearney Street. Approximately 4,000 – 6,000 vehicles per day utilize the corridor. The speed limit is 30 mph. Signalized intersections along the corridor include College Street, Chestnut Expressway, Nicholas Street, Division Street, Commercial Street, Atlantic Street, High Street, and Kearney Street. Land uses are primarily residential with commercial uses at the major intersections. There are no bicycle facilities; sidewalks are present on both sides throughout the corridor except between Commercial Street and Chase Street where Grant Avenue goes under the railroad tracks.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Pedestrian	4	8	0	12
Out of control	4	4	36	44
Head on	3	7	5	15
Right angle	1	44	24	69
Left turn	1	20	18	39
Left turn right angle collision	1	12	8	21
Passing	1	4	7	12
Right turn right angle collision	1	1	6	8
Rear end	0	39	62	101
Pedalcycle	0	3	1	4
Other	0	2	1	3
Fixed object	0	1	8	9
Parking or parked car	0	1	5	6
Right turn	0	1	4	5
Sideswipe	0	0	4	4
Backing	0	0	3	3
Changing lane	0	0	1	1
Total	***16***	***147***	***193***	***356***

Project Prioritization

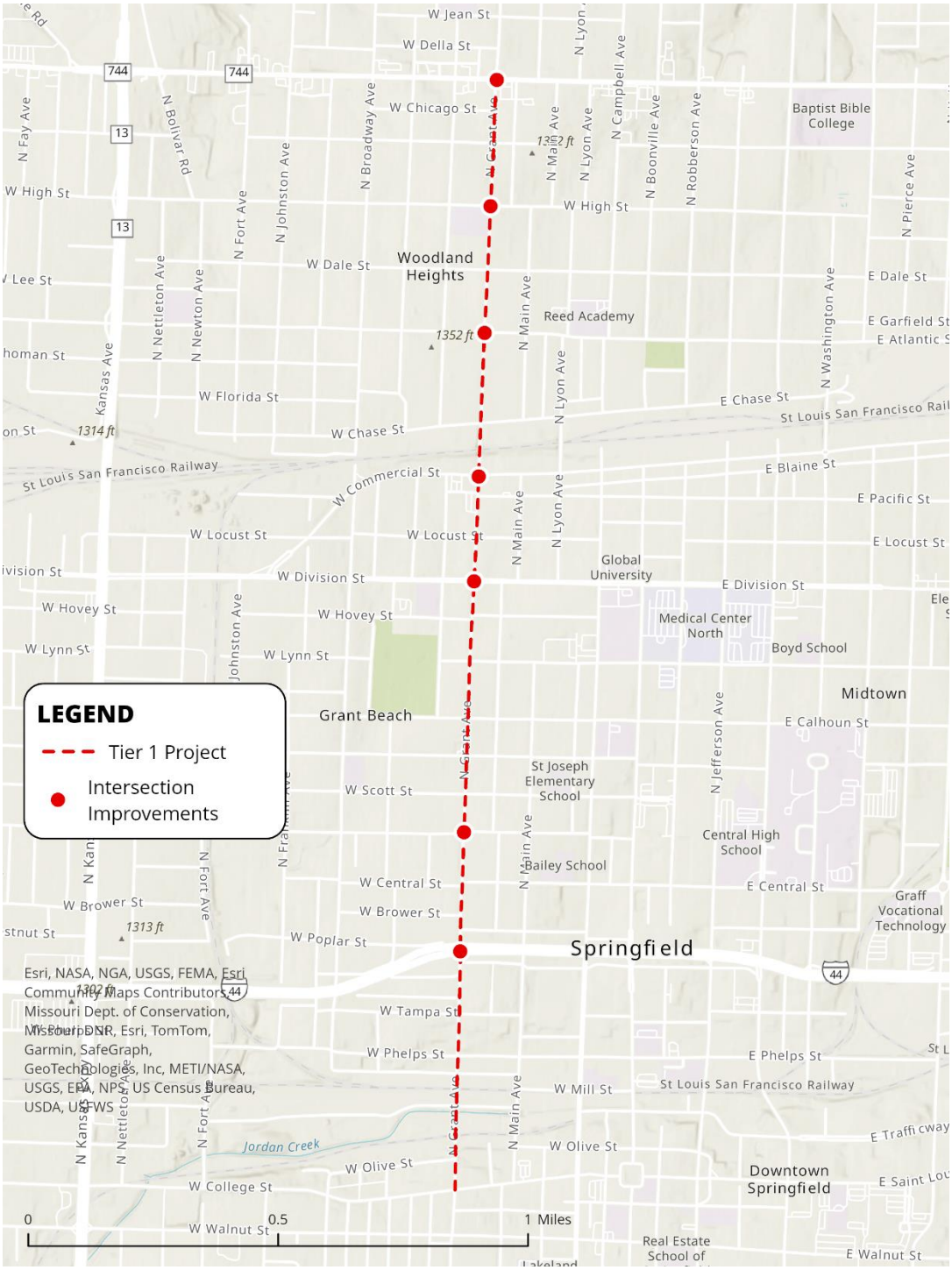
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	Yes	Yes	Springfield	Urban	No	Yes	No	16	19

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Road Diet	Reduce pedestrian and bicycle crashes and vehicle speeds	--	Long-term	No	2.2 miles	$150,000 per mile	$330,000
Shared Use Path	Reduce bicycle and pedestrian crashes	--	Long-term	No	2.2 miles	$700,000 per mile	$1,540,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	7 intersections	$25,000 per intersection	$175,000
BASELINE ESTIMATED TOTAL							**$2,100,000**

Countermeasures selected based on the continuation of the Grant Avenue Parkway Project.

FIGURE 13 – GRANT AVE (COLLEGE ST TO KEARNEY ST)



Tracker Rd (Nicholas Rd to US 160)

Existing Conditions

Tracker Road is a 1.3-mile major collector with one lane in each direction and narrow shoulders. The speed limit is 35 mph. The intersection at Nicholas Road is a four-way stop controlled intersection; Tracker Road and US 160 is a signalized intersection. There are no bicycle or pedestrian facilities. Land uses include rural residential and agricultural.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Left turn	4	7	2	13
Right angle	1	2	5	8
Rear end	0	2	12	14
Left turn right angle collision	0	1	5	6
Head on	0	1	4	5
Out of control	0	0	6	6
Sideswipe	0	0	3	3
Right turn right angle collision	0	0	1	1
Debris	0	0	1	1
Total	***5***	***13***	***39***	***57***

Project Prioritization

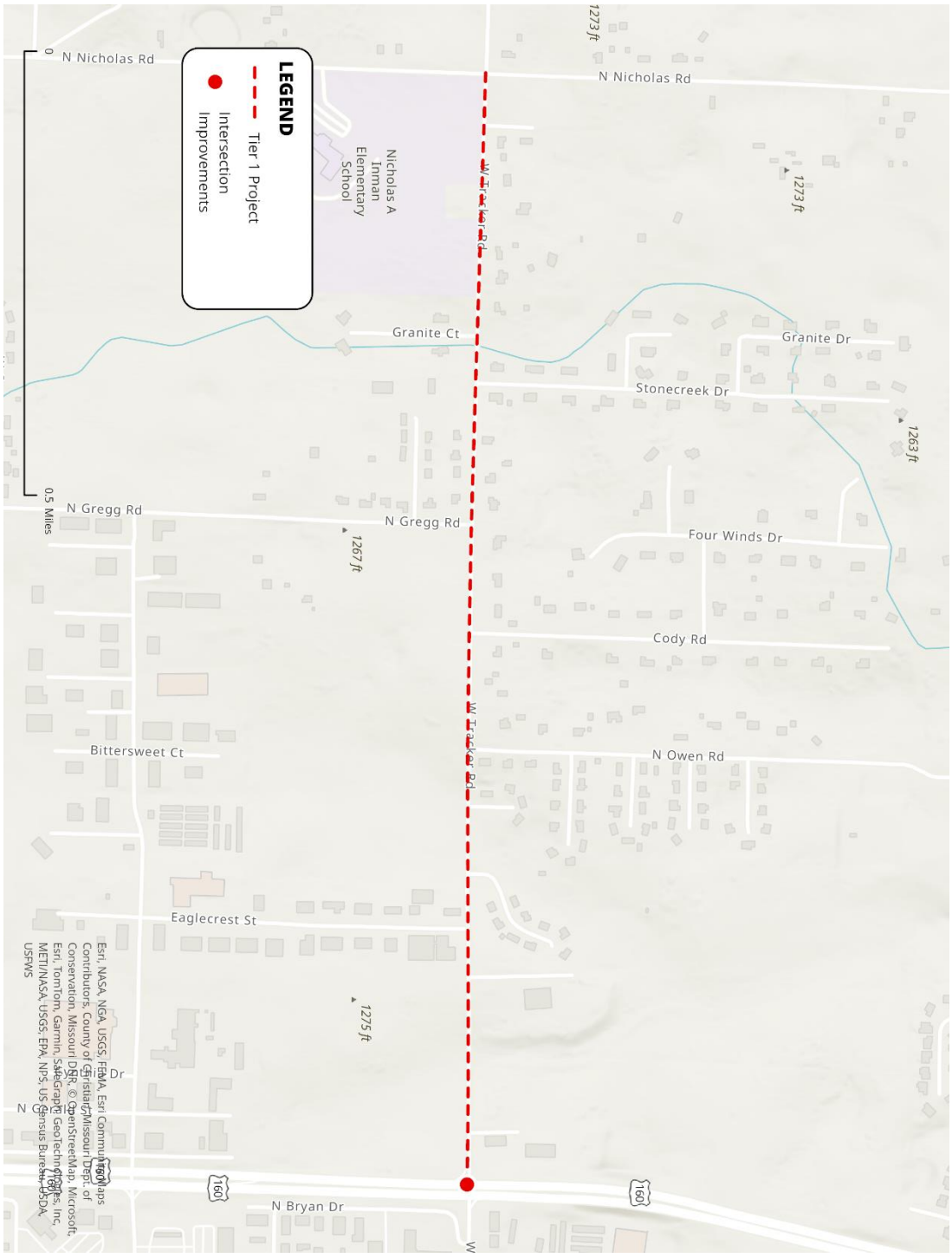
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	No	No	Nixa	Urban	No	Yes	Yes	5	10

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	1 intersection	$5,000 per intersection	$5,000
Signal Heads with Retroreflective Backplates	Reduce rear end and right-angle crashes	15% reduction in total crashes	Short-term	No	13 signals	$3,000 per signal	$39,000
Reduced Conflict Left Turn Intersections	Reduce left turn and right angle crashes	63% reduction in KSI crashes	Long-term	Yes	1 intersection	$1,000,000 per intersection	$1,000,000
BASELINE ESTIMATED TOTAL							**$1,100,000**

All KSI crashes occurred at the Tracker Road/US 160 intersection; countermeasures focused on intersection improvements

FIGURE 14 – TRACKER RD (NICHOLAS RD TO US 160)



National Ave (Chestnut Ex to Kearney St)

Existing Conditions

National Avenue is a 1.8-mile minor arterial with two through lanes in each direction with a center left turn lane. Average daily traffic volume is approximately 5,000 – 10,000 vehicles per day. The speed limit is 35 mph. Signalized intersections along the corridor include Chestnut Expressway, Central Street, Pythian Street, Division Street, Commercial Street, Dale Street, Turner Street, and Kearney Street. Well-connected sidewalks are present on both sides of the street. There are no bicycle facilities along the corridor but a connection to the Jordan Creek Greenway provides access to Silver Springs Park and Smith Park. Adjacent land uses are primarily residential.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Left turn	4	17	16	37
Out of control	3	11	22	36
Pedalcycle	3	4	0	7
Pedestrian	3	3	1	7
Rear end	2	28	32	62
Head on	2	11	6	19
Other	1	2	2	5
Right angle	0	40	32	72
Left turn right angle collision	0	8	9	17
Passing	0	6	27	33
Right turn right angle collision	0	4	5	9
Right turn	0	1	0	1
Fixed object	0	0	2	2
Backing	0	0	2	2
Changing lane	0	0	1	1
Sideswipe	0	0	1	1
Total	***18***	***135***	***158***	***311***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	Yes	Yes	Springfield	Urban	No	No	No	18	18

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Road Diet	Reduce fatal and serious injury crashes and vehicle speeds	--	Long-term	No	1.8 miles	$150,000 per mile	$270,000
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	8 intersections	$5,000 per intersection	$40,000
Bicycle Lanes – On-Street	Reduce bicycle crashes	30% - 49% reduction in total crashes	Mid-term	No	1.8 miles	$120,000 per mile	$216,000
Bicycle Lanes – Elevated Cycle Track	Reduce bicycle crashes	30% - 49% reduction in total crashes	Long-term	Yes	1.8 miles	$600,000 per mile	$1,080,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	8 intersections	$25,000 per intersection	$200,000
Pedestrian Refuge Islands	Reduce pedestrian crashes Reduce vehicle speeds	56% reduction in pedestrian crashes	Mid-term	No	16 islands	$115,000 per island	$1,840,000
Leading Pedestrian Interval	Reduce pedestrian crashes	13% reduction in pedestrian crashes	Short-term	No	8 intersections	$5,000 per intersection	$40,000
BASELINE ESTIMATED TOTAL							**$2,600,000 - $3,500,000**

Baseline estimated total range reflects on-street bicycle lanes or an elevated cycle track.

FIGURE 15 – NATIONAL AVE (CHESTNUT EX TO KEARNEY ST)

Grand St (Kansas Ex to Glenstone Ave)

Existing Conditions

Grand Street is a 3-mile minor arterial with various roadway configurations. From the Kansas Expressway to National Avenue, there are two through lanes in each direction with a grassy median from the Kansas Expressway to Grant Avenue and a center turn lane from Grant Avenue to National Ave. From National Avenue to Glenstone Avenue, there is one through lane in each direction with a center turn lane. Signalized intersections along the corridor include Kansas Expressway, Fort Avenue, Grant Avenue, Campbell Avenue, South Avenue, Jefferson Avenue, Kimbrough Avenue, Holland Avenue, John Q. Hammond Parkway, King Avenue, National Avenue, Fremont Avenue, and Glenstone Avenue. The corridor carries around 8,000 vehicles per day west of National Avenue and around 4,000 vehicles per day to the west of National Avenue. There are sidewalks on both sides of the street but no bicycle facilities. Land uses include residential, some commercial, and schools such as Missouri State University.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Left turn	4	34	34	72
Out of control	4	16	56	76
Pedestrian	4	16	0	20
Rear end	1	55	115	171
Right angle	1	51	38	90
Left turn right angle collision	1	23	39	63
Head on	1	11	11	23
Other	1	0	0	1
Pedalcycle	0	13	0	13
Right turn right angle collision	0	7	9	16
Passing	0	5	33	38
Sideswipe	0	4	3	7
Avoiding	0	2	0	2
Parking or parked car	0	1	4	5
Backing	0	1	3	4
Dual lefts collide	0	1	2	3
Fixed object	0	1	2	3
Right turn	0	0	2	2
Changing lane	0	0	1	1
Total	***17***	***241***	***352***	***610***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	Yes	Yes	Springfield	Urban	No	No	No	17	18

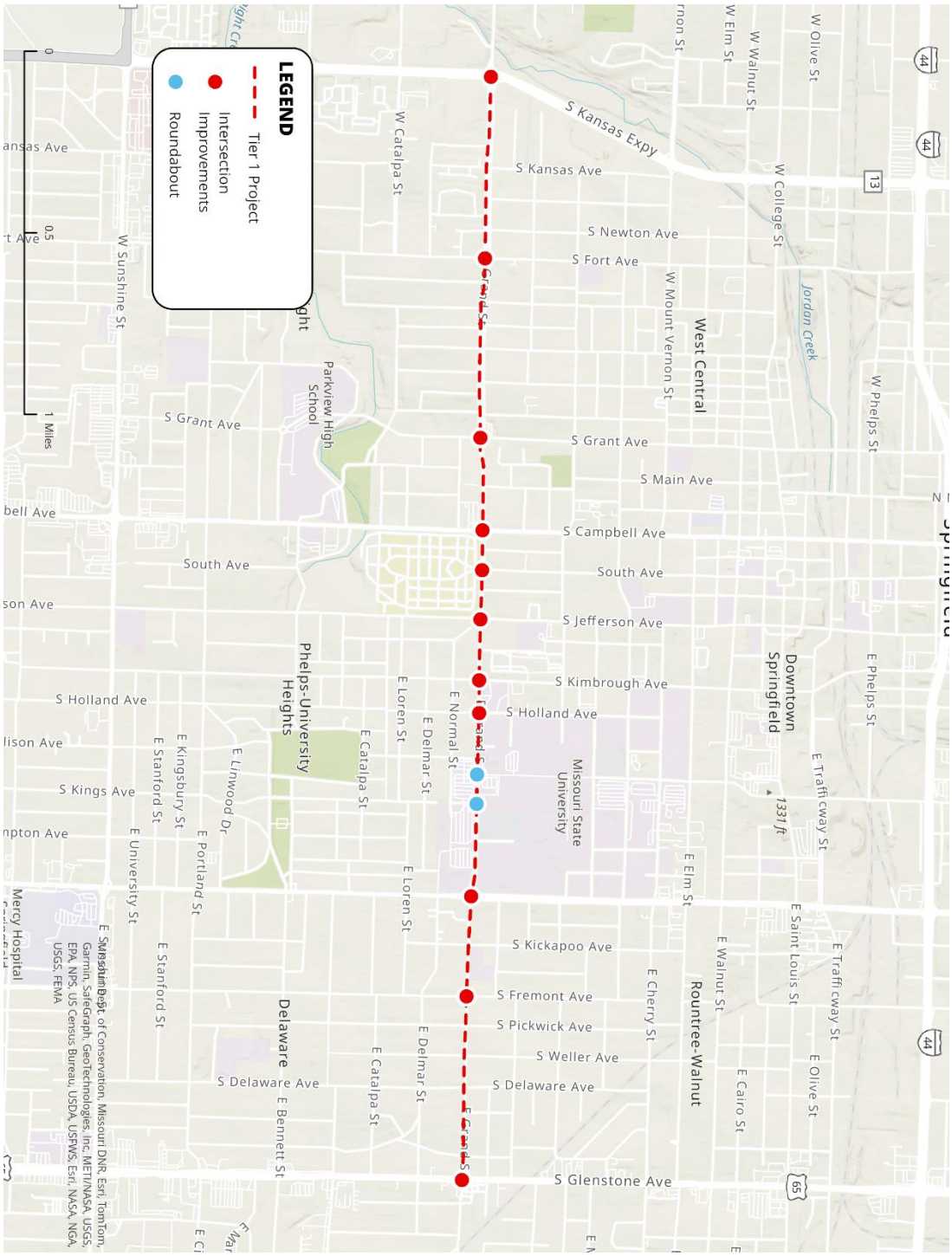
Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Road Diet	Reduce fatal and serious injury crashes and vehicle speeds	--	Long-term	No	3 miles	$150,000 per mile	$450,000
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	13 intersections	$5,000 per intersection	$65,000
Bicycle Lanes – On-Street	Reduce bicycle crashes	30% - 49% reduction in total crashes	Mid-term	No	3 miles	$120,000 per mile	$360,000
Bicycle Lanes – Elevated Cycle Track	Reduce bicycle crashes	30% - 49% reduction in total crashes	Long-term	No	3 miles	$600,000 per mile	$1,800,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	13 intersections	$25,000 per intersection	$325,000
Pedestrian Refuge Islands	Reduce pedestrian crashes Reduce vehicle speeds	56% reduction in pedestrian crashes	Mid-term	No	22 islands	$115,000 per island	$2,530,000
Leading Pedestrian Interval	Reduce pedestrian crashes	13% reduction in pedestrian crashes	Short-term	No	13 intersections	$5,000 per intersection	$65,000
Roundabouts	Reduce left turn crashes	82% reduction in fatal and serious injury crashes	Long-term	Yes	2 intersections*	$2,000,000 per intersection	$4,000,000
BASELINE ESTIMATED TOTAL							**$7,800,000 - $9,200,000**

**2 proposed roundabouts at John Q. Hammond Parkway and King Avenue*

Baseline estimated total range reflects on-street bicycle lanes or an elevated cycle track.

FIGURE 16 – GRAND ST (KANSAS EX TO GLENSTONE AVE)



Division St (Kansas Ex to Sherman Ave)

Existing Conditions

Division Street is a 1.7-mile minor arterial with one through lane in each direction with a center turn lane throughout much of the corridor. The corridor carries approximately 4,000 – 7,000 vehicles per day and the speed limit is 35 mph. Signalized intersections include the Kansas Expressway, Grant Avenue, Campbell Avenue, Boonville Avenue, Roberson Avenue, Benton Avenue, Washington Avenue, and Sherman Avenue. Sidewalks are well connected on both sides of the street; there is a mid-block pedestrian signal near Grant Avenue at Weaver Elementary school. There are a combination of painted bicycle lanes and shared lane markings from around Commercial Street to Washington Ave. Land uses are primarily residential, medical, and educational.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Out of control	7	5	12	24
Right angle	3	35	31	69
Pedestrian	3	9	0	12
Rear end	1	29	55	85
Left turn	1	5	8	14
Pedalcycle	1	3	0	4
Left turn right angle collision	0	9	7	16
Right turn right angle collision	0	4	5	9
Head on	0	2	2	4
Passing	0	1	8	9
Other	0	1	3	4
Avoiding	0	1	0	1
Sideswipe	0	0	3	3
Right turn	0	0	2	2
Changing lane	0	0	1	1
Dual lefts collide	0	0	1	1
U - turn	0	0	1	1
Fixed object	0	0	1	1
Backing	0	0	1	1
Total	***16***	***104***	***141***	***261***

Project Prioritization

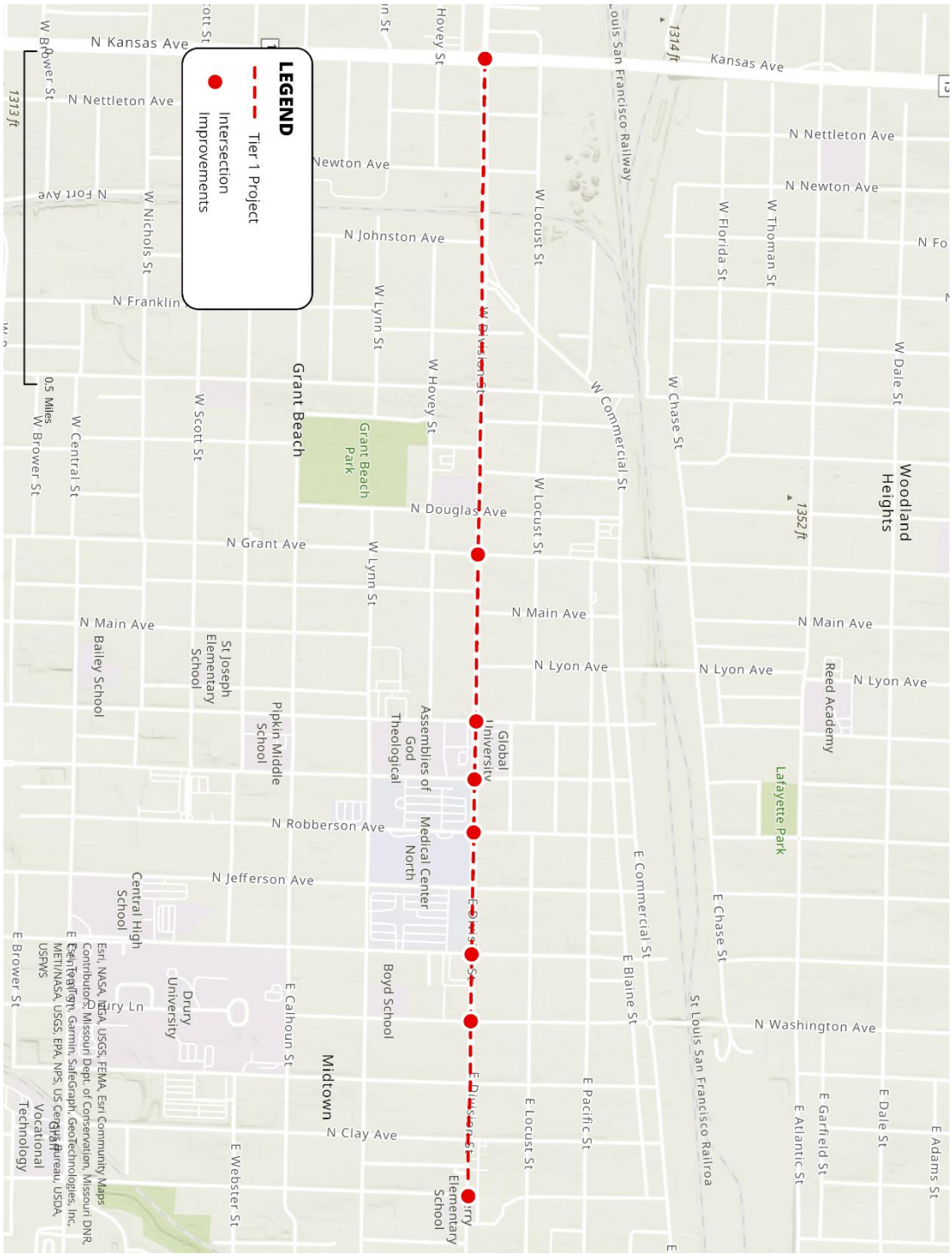
System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	Yes	Yes	Springfield	Urban	No	No	No	16	18

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Road Diet	Reduce fatal and serious injury crashes and vehicle speeds	--	Long-term	No	1.7 miles	$150,000 per mile	$255,000
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	8 intersections	$5,000 per intersection	$40,000
Bicycle Lanes – On-Street	Reduce bicycle crashes	30% - 49% reduction in total crashes	Mid-term	No	1.7 miles	$120,000 per mile	$204,000
Bicycle Lanes – Elevated Cycle Track	Reduce bicycle crashes	30% - 49% reduction in total crashes	Long-term	No	1.7 miles	$600,000 per mile	$1,020,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	8 intersections	$25,000 per intersection	$200,000
Pedestrian Refuge Islands	Reduce pedestrian crashes Reduce vehicle speeds	56% reduction in pedestrian crashes	Short-term	No	16 islands	$115,000 per island	$1,840,000
Leading Pedestrian Interval	Reduce pedestrian crashes	13% reduction in pedestrian crashes	Short-term	No	8 intersections	$5,000 per intersection	$40,000
BASELINE ESTIMATED TOTAL							**$2,600,000 - $3,400,000**

Baseline estimated total range reflects on-street bicycle lanes or an elevated cycle track.

FIGURE 17 – DIVISION ST (KANSAS EX TO SHERMAN AVE)



Sunshine St (Kansas Ex to Campbell Ave)

Existing Conditions

Sunshine Street is a 1.3-mile principal arterial with two through lanes in each direction with a center turn lane. The corridor carries around 12,000 – 15,000 vehicles per day and the speed limit is 40 mph. There are signalized intersections at the Kansas Expressway, Fort Avenue, Grant Avenue, and Campbell Avenue. There are some sidewalks, but connectivity is lacking, and pedestrian crossings are also lacking. There are no bicycle facilities along the corridor. Land use is primarily commercial.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Right angle	3	16	9	28
Pedestrian	3	1	0	4
Left turn	2	14	15	31
Out of control	2	8	13	23
Rear end	1	53	68	122
Left turn right angle collision	1	22	25	48
Head on	1	17	5	23
Passing	1	4	17	22
Fixed object	1	0	1	2
Right turn right angle collision	0	4	8	12
Changing lane	0	2	4	6
Dual lefts collide	0	2	0	2
U - turn	0	2	0	2
Right turn	0	1	4	5
Other	0	1	3	4
Sideswipe	0	0	2	2
Parking or parked car	0	0	1	1
Total	***15***	***147***	***175***	***337***

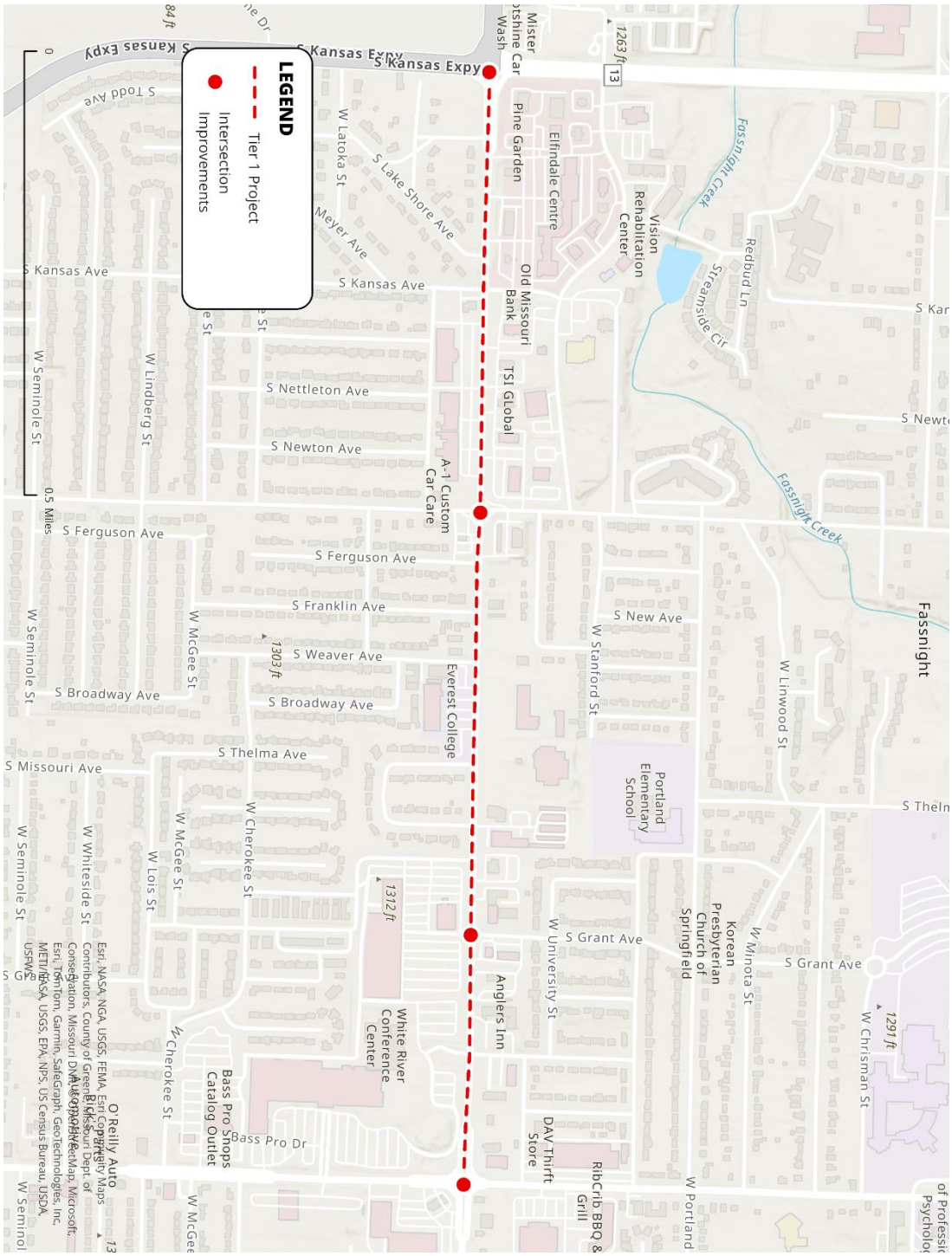
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	Yes	Yes	Springfield	Urban	No	No	No	15	18

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Road Diet	Reduce fatal and serious injury crashes and vehicle speeds	--	Long-term	No	1.3 miles	$150,000 per mile	$195,000
Medians	Reduce out of control crashes	97% reduction in cross median crashes	Long-term	No	1.3 miles	$1,600,000 per mile	$2,100,000
Permissive to Protected Left Turn Phase	Reduce left turn and head on crashes	--	Short-term	No	4 intersections	$5,000 per intersection	$20,000
Signal Heads with Retroreflective Backplates	Reduce rear end and right-angle crashes	15% reduction in total crashes	Short-term	No	55 signals	$3,000 per signal	$275,000
Sidewalks	Reduce pedestrian crashes	65%-89% reduction in pedestrian crashes	Short-term	Yes	1.3 miles	$370,000 per mile	$481,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	4 intersections	$25,000 per intersection	$100,000
Pedestrian Refuge Islands	Reduce pedestrian crashes Reduce vehicle speeds	56% reduction in pedestrian crashes	Short-term	No	8 islands	$115,000 per island	$920,000
Leading Pedestrian Interval	Reduce pedestrian crashes	13% reduction in pedestrian crashes	Short-term	No	4 intersections	$5,000 per intersection	$20,000
Corridor Access Management	Reduce pedestrian, rear end, and right-angle crashes	25%-31% reduction in KSI crashes	Long-term	Yes	-	-	-
BASELINE ESTIMATED TOTAL							**$4,100,000**

FIGURE 18 – SUNSHINE ST (KANSAS EX TO CAMPBELL AVE)



Hines St (Oakwood Ave to Route ZZ)

Existing Conditions

Hines Street is a 1.8-mile major collector with one through lane in each direction and no shoulders. The street carries around 1,000 – 2,000 vehicles per day and the speed limit is 30mph. Major intersections include four-way stop controlled intersections at Oakwood Avenue and Route ZZ. There is a short section of sidewalk between Lincoln Avenue and Franklin Avenue but otherwise the corridor lacks sidewalks and bicycle facilities. Land use is primarily suburban residential with some undeveloped agricultural land.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Right angle	1	1	6	8
Out of control	0	2	2	4
Rear end	0	1	2	3
Head on	0	1	1	2
Other	0	1	0	1
Left turn right angle collision	0	1	0	1
Left turn	0	0	2	2
Avoiding	0	0	1	1
Total	***1***	***7***	***14***	***22***

Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	No	Yes	Republic	Urban	No	No	Yes	1	4

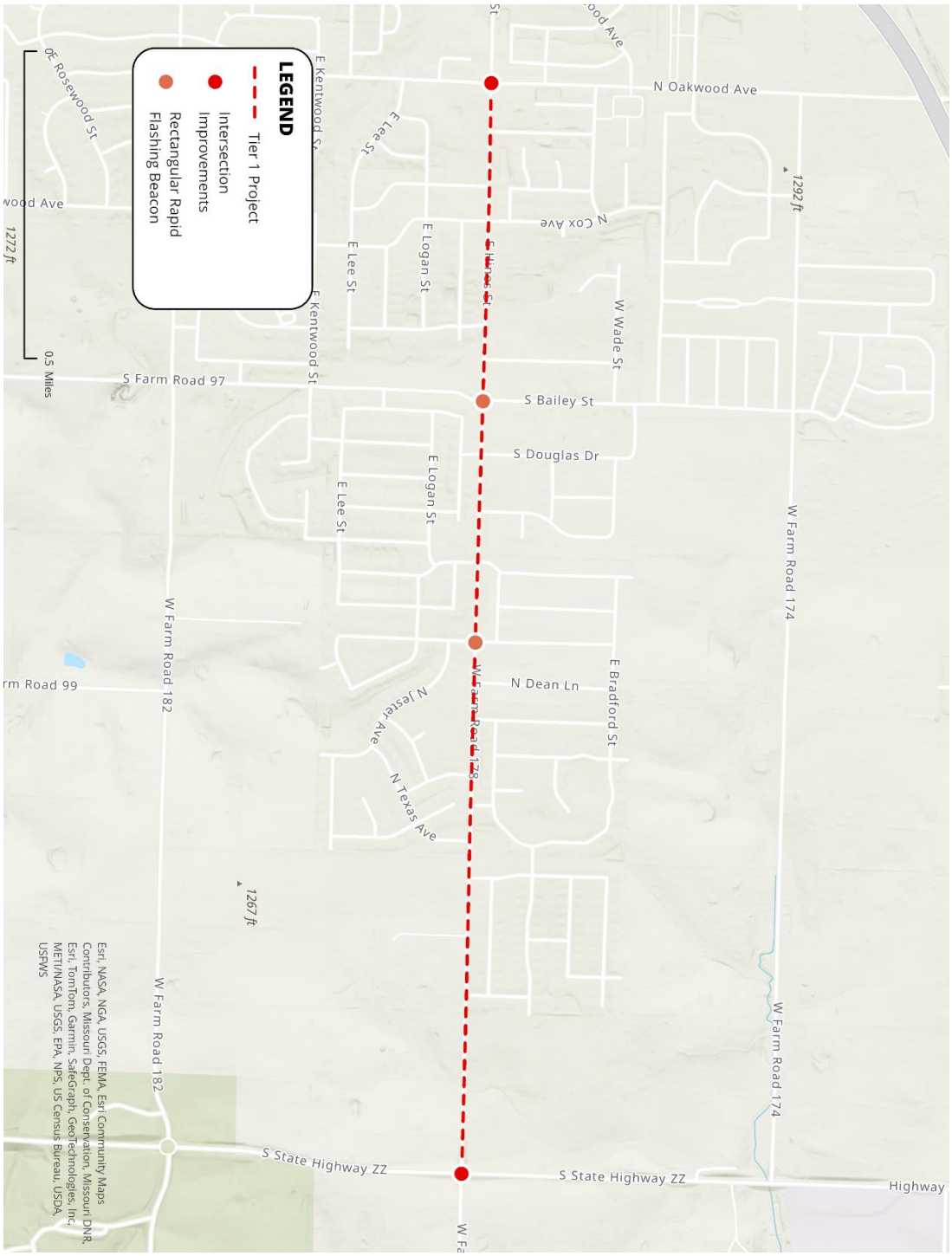
Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Sidewalks	Reduce bicycle and pedestrian crashes	65%-89% reduction in pedestrian crashes	Short-term	Yes	1.3 miles (one side only)	$370,000 per mile	$481,000
Shared Use Path	Reduce bicycle and pedestrian crashes	--	Long-term	Yes	1.3 miles	$700,000 per mile	$910,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	2 intersections	$25,000 per intersection	$50,000
Rectangular Rapid Flashing Beacons	Reduce pedestrian and speed related crashes	47% reduction in pedestrian crashes	Short-term	No	2 mid-block crossings*	$25,000 each	$50,000
BASELINE ESTIMATED TOTAL							**$580,000 – $1,000,000**

**RRFBs proposed at Bailey Street/Farm Road 97 and Glenwood Avenue*

Baseline estimated total range reflects a 5-foot sidewalk or a 10-foot shared use path on one side of the street only

FIGURE 19 – HINES ST (OAKWOOD AVE TO ROUTE ZZ)



S Campbell Ave (Battlefield St to Republic Rd)

Existing Conditions

Campbell Avenue is a 1.5-mile principal arterial with two through lanes in each direction and a center left turn lane. The corridor carries approximately 20,000 vehicles per day and the speed limit is 40 mph. There are signalized intersections at Battlefield Street, Walnut Lawn Street, Westview Street/Primrose Street, and Republic Road. Sidewalks are disconnected and pedestrian crossings are inconvenient. There are no bicycle facilities. Land uses along the corridor are primarily commercial.

Crash History (2018-2022)

Crash Type	KSI	Minor Injury	PDO	Total
Left turn	9	32	42	83
Passing	3	5	28	36
Left turn right angle collision	2	66	44	112
Right angle	1	29	22	52
Head on	1	18	7	26
Out of control	1	13	30	44
Pedestrian	1	4	1	6
Rear end	0	118	145	263
Changing lane	0	3	5	8
Right turn right angle collision	0	2	6	8
Right turn	0	1	5	6
Other	0	1	3	4
Pedalcycle	0	1	2	3
U - turn	0	1	1	2
Avoiding	0	1	1	2
Sideswipe	0	0	3	3
Fixed object	0	0	2	2
Parking or parked car	0	0	1	1
Total	***18***	***295***	***348***	***661***

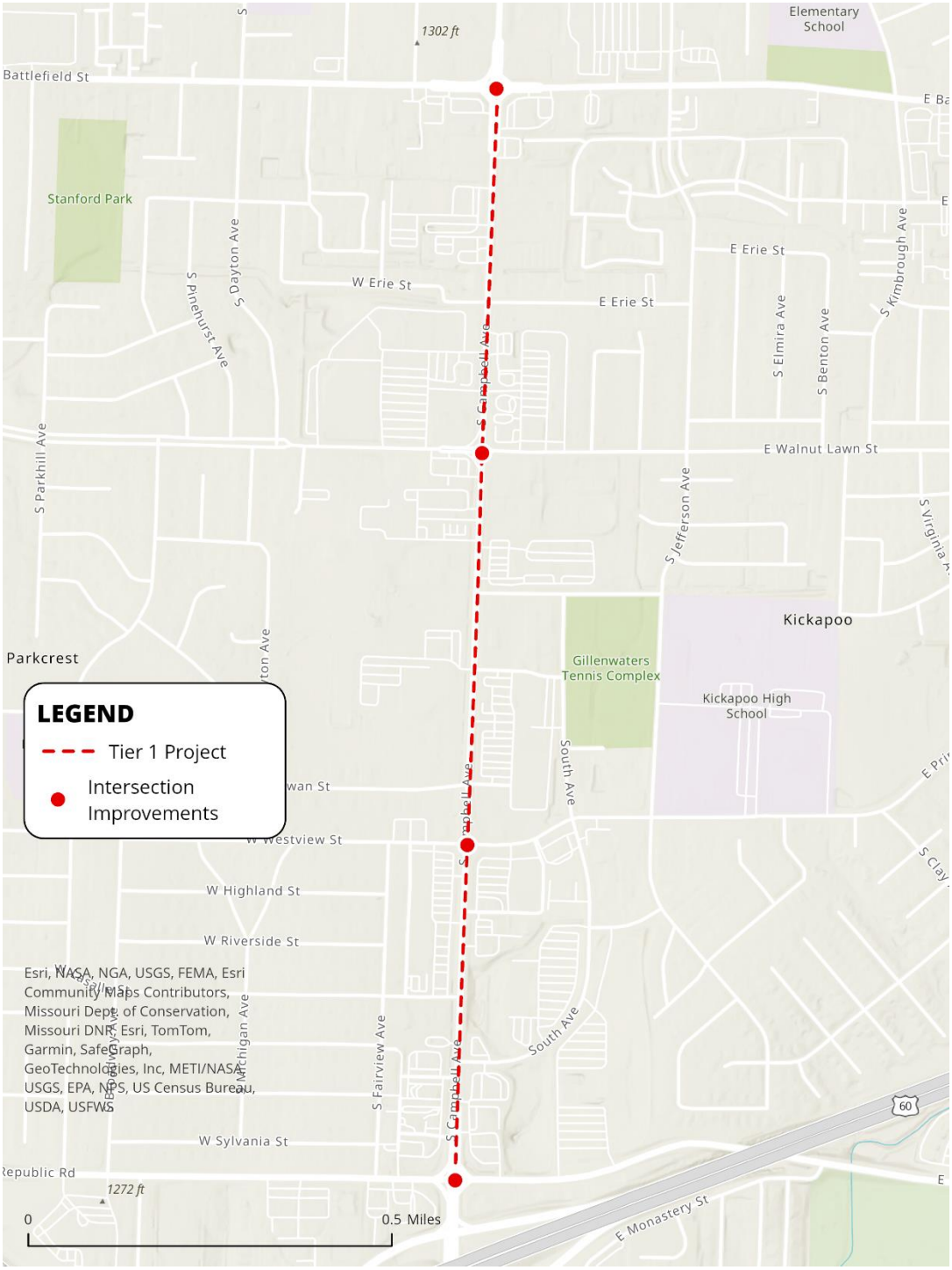
Project Prioritization

System	HIN	CEJST	Municipality	Area Type	STIP Priority	Public Input	Local Input	KSI Crashes	Priority Score
Local	Yes	Yes	Springfield	Urban	No	No	Yes	18	18

Recommendations

Countermeasure	Purpose	Benefit	Timeframe	ROW	Quantity	Planning Level Cost	Estimated Cost
Dilemma Zone Detection	Reduce rear end and right-angle crashes	39% reduction in KSI crashes at intersections	Short-term	No	4 intersections	$60,000 per intersection	$240,000
Signal Heads with Retroreflective Backplates	Reduce rear end and right-angle crashes	15% reduction in total crashes	Short-term	No	56 signals	$3,000 per signal	$168,000
Permissive to Protected Left Turn Phase	Reduce left turn and right-angle crashes	--	Short-term	No	4 intersections	$5,000 per intersection	$20,000
Improved Right Turn Angles	Reduce pedestrian crashes Reduce vehicle speeds	--	Mid-term	Yes	12 right turns	$400,000 per right turn	$4,800,000
Medians	Reduce out of control and head on crashes	97% reduction in cross median crashes	Long-term	No	1.5 miles	$1,600,000 per mile	$2,400,000
Sidewalks	Reduce pedestrian crashes	65%-89% reduction in pedestrian crashes	Short-term	No	1.3 miles	$370,000 per mile	$481,000
Crosswalk Enhancements	Reduce pedestrian and out of control crashes	40% reduction in pedestrian crashes	Short-term	No	4 intersections	$25,000 per intersection	$100,000
Corridor Access Management	Reduce pedestrian, rear end, and right-angle crashes	25%-31% reduction in KSI crashes	Long-term	Yes	--	--	--
BASELINE ESTIMATED TOTAL							**$8,200,000**

FIGURE 20 – S CAMPBELL AVE (BATTLEFIELD ST TO REPUBLIC RD)



COSTS AND ASSUMPTIONS

Countermeasure	Cost	Unit	Note/Assumptions
Automated Enforcement	$100,000	Intersection	
Bicycle Lanes (elevated Cycle Track)	$600,000	Mile	Does not include curb ramps, adjust to grade items, signal timing, bike signals
Bicycle Lanes (On Road)	$120,000	Mile	Does not include curb ramps, reconstructed curb, adjust to grade items, signal timing, bike signals; both sides of street
Crosswalk Enhancements	$25,000	Intersection	Assume restriping of crosswalk, 240’; does not include adding signage
Curve Improvements (Horizontal Radius Improvement)	$1,500,000	Curve	
Curve Improvements (Curve Warning)	$35,000	Curve	
Dilemma Zone Detection	$60,000	Intersection	
Dynamic Speed Monitoring Systems	$20,000	Each	per display
Improved Right Turn Angle	$400,000	Right Turn	Assume reconstruction of the corner radius
Intersection Conflict Warning Systems	$35,000	Intersection	
Leading Pedestrian Intervals	$5,000	Intersection	Assume ped signal heads already present
Medians	$1,600,000	Mile	Assume no widening at 9' wide with Curb and 24" gutter
Medians - Cable Barrier	$525,000	Mile	Assume no widening /only the cost of adding cable barrier on one side
Pedestrian Refuge Island	$115,000	Island	Assume 2 curb ramps; island 8’ by 40’
PHBs	$120,000	UNIT	Includes power, conduit, and signals
Protected Left Turns	$5,000	Intersection	
Reduced Left-Turn Conflict Intersections	$1,000,000	Intersection	
Road Diets	$150,000	Mile	
Roadway Lighting - corridor	$480,000	Mile	Assume ~275' spacing and $12K EA on each side of road
Roadway Lighting - intersection	$30,000	Intersection	Assume 4 lights per intersection
Roundabouts	$2,000,000	Intersection	
RRFBs	$25,000	Each	Assume crosswalk and curb ramps excluded / includes both sides of road
Rumble Strips	$10,000	Mile	Assume shoulder on 1 side and no centerline
Shared Use Paths	$700,000	Mile	Assume 10' wide and no unusual site conditions
Sidewalks	$370,000	Mile	Assumes 5' wide and no unusual site conditions
Signage	$1,000	Each	Assume a standard road sign
Signal Heads with Retroreflective Backplates	$3,000	Signal	Assume the existing conduit can be used
Systemic Application at Stop Intersections	$15,000	Intersection	
Yellow Change Intervals	$5,000	Intersection	