

Gibson Road: County Road 98 to College Street

In an eight-year period, 117 collisions occurred along or near Gibson Road between County Road 98 and College Street. These collisions totaled 25 injured persons from 19 separate collisions, and zero fatalities.

The major collision factors included unsafe speed, auto right-of way violations, traffic signal or sign violations, and improper turning. Most collisions occurred at or within 100 feet of intersections, with most of those

collisions occurring (in descending order) at the Cottonwood Street, West Street, College Street, County Road 98, and Ashley Avenue intersections.

Corridor Collision Profile

Countermeasure Objectives:

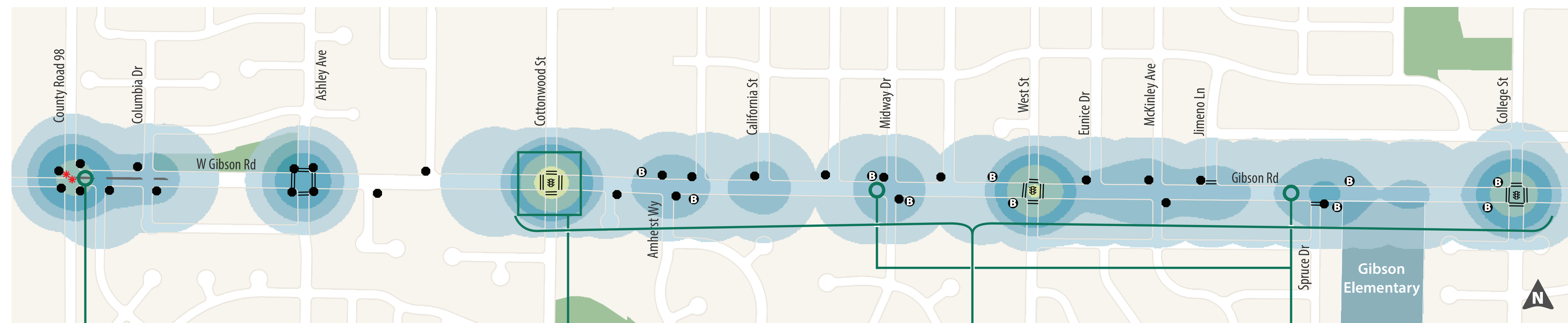
- Reduce speeding
- Enhance pedestrian safety
- Improve pedestrian connectivity

What do we know about these collisions (2009-2016)?



In the Map:

- ⚡ Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
 - ★ Flashing Beacon
 - Ⓛ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

Crosswalk on east side of Gibson Rd/ County Road 98

A crosswalk on this corridor bookend would raise driver awareness of pedestrians and provide a safer north-south pedestrian connection along County Road 98.

Signal timing modifications at Gibson Rd/ Cottonwood St

Signal timing modifications that reduce or eliminate conflict between southbound and northbound vehicles could decrease the number of collisions. The implementation of a road diet would eliminate collisions due to westbound through vehicles merging before, during, or after the intersection.

Road diet between west of Cottonwood St and College St

This would include reducing to a three lane cross-section, including one eastbound lane, one westbound lane, and one two-way left-turn lane (TWLTL). The TWLTL would increase storage length for the westbound left-turn into Gibson Elementary School. Furthermore, a road diet would potentially provide additional on-street parking, such as across Gibson Elementary School or on the south side of Gibson road between Midway Drive and West Street. A road diet could also allow for buffered bike lanes.

Gibson Road crosswalk on west side of Midway Rd and Spruce Dr

A Midway Dr crosswalk would provide a north-south connection near an existing bus stop, while a Spruce Dr crosswalk would intersect the 1/2 mile distance between the College St and West St crosswalks. The following will be required:

- Pedestrian Hybrid Beacon (PHB) with
 - High visibility crosswalks markings,
 - Parking restrictions on crosswalk approach
 - Adequate lighting, and
 - Curb extensions.
- Consideration of pedestrian refuge islands
- If a road diet and other measures caused speed reduction to 30 mph, then FHWA guidance would drop from PHB to Advance Yield lines with consideration of in-street signs.

Gibson Road: College Street to Matmor Road

Between 2009 and 2016, 148 collisions occurred along or near Gibson Road between College Street and Matmor Road, resulting in 48 injuries from 34 separate incidents and in zero fatalities. The major collision causes

included unsafe speed, traffic signals or signs violations, improper turning, and automobile right-of-way violations. A large percentage of collisions occurred during weekday morning and evening peak hours, and three-fifths of

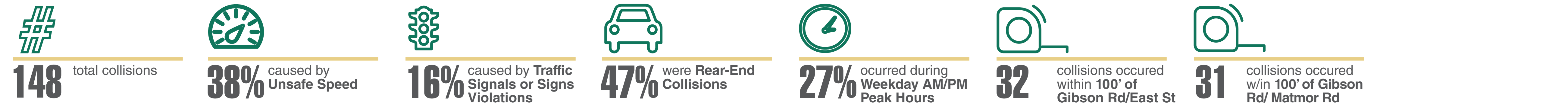
these were due to unsafe speed. Of all the intersections in this corridor, Gibson Road/East Street and Gibson Road/Matmor Road were the most prone to collisions.

Corridor Collision Profile

Countermeasure Objectives:

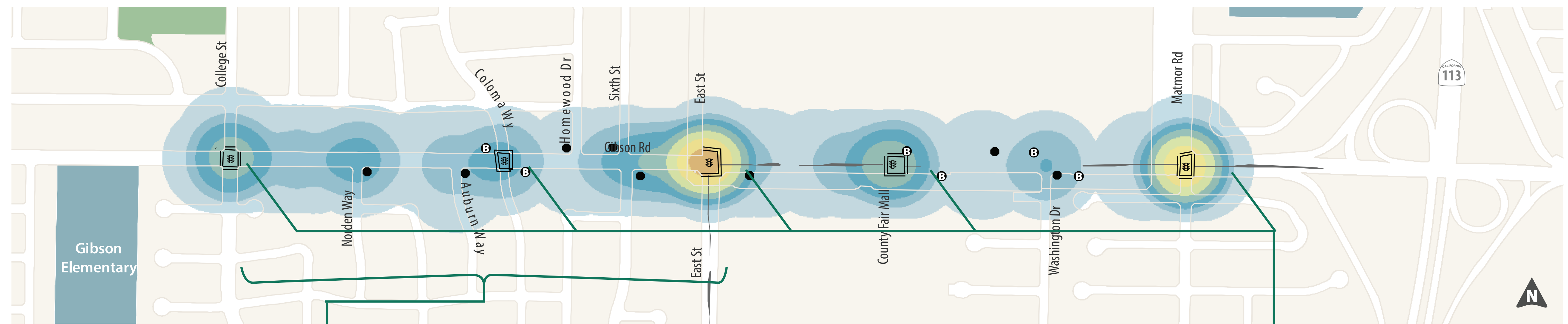
- Reduce speeding
- Reduce rear-end collisions
- Improve safety at major intersections

What do we know about these collisions (2009-2016)?



In the Map:

- ⚡ Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
 - ★ Flashing Beacon
 - Ⓟ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

Road diet between College St and East St

This would include reducing to a three lane cross-section, with one eastbound lane, one westbound lane, and one two-way left-turn lane (TWLTL). This road diet would connect to the recommended road diet west of College Street. It would serve to reduce collisions caused by unsafe speed, which is the leading cause of collisions on this corridor. In addition, there are four side streets on this section of Gibson Road that do not have ingress turn pockets, meaning that ingress vehicles must slow down or stop in through lanes as they wait for gaps to turn. A TWLTL would provide these vehicles with separation from through traffic.

Red time and/or yellow adjustment at all signalized intersections

Thirty percent of the collisions at Gibson Road/East Street and Gibson Road/Matmor Road occur between vehicles that should not be crossing the intersection at the same time. Gibson Road/East Street currently provides 0 or 0.5 seconds of red time, depending on the phase. Gibson Road/Matmor Road has similar red time settings. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

Gibson Road: Matmor Road to County Road 102

Gibson Road between Matmor Road and County Road 102 contains Pioneer High School and one of the most crucial interchanges in the City. Over an eight-year period, there were 181 collisions along or near this corridor, resulting in 46 injuries from

33 separate incidents and in zero fatalities. Almost half of the collisions in this corridor were due to unsafe speed. The rest of the major collision causes included traffic signals or signs violations, improper turning, and automobile right-of-way violations. Due to the

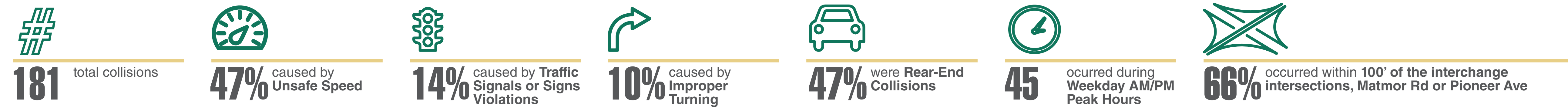
presence of the high school, 23% of collisions involved a driver, bicyclist, or pedestrian age 18 years or under. 26 of these youth-involved collisions occurred between 7:00 AM and 4:00 PM on weekdays, with most being triggered by unsafe speeds.

Corridor Collision Profile

Countermeasure Objectives:

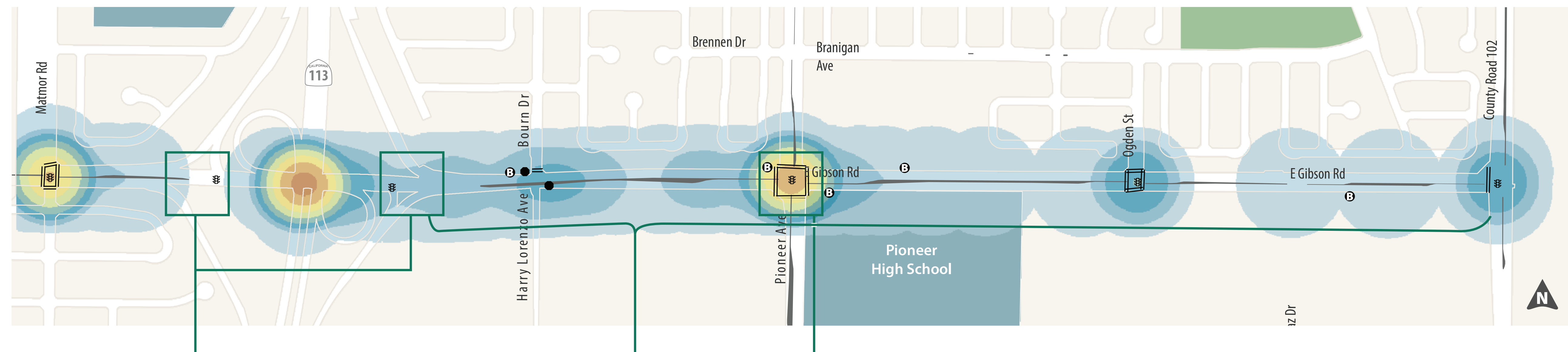
- Reduce speeding
- Improve youth safety
- Make intersections safer for conflicting movements

What do we know about these collisions (2009-2016)?



In the Map:

- ⊠ Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
 - * Flashing Beacon
 - ⊙ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

Square up interchange intersections

Modify the ramp intersections to reduce vehicle speeds accessing or exiting SR 113. This could be accomplished by increasing the angle of approach for the ramps so that they are more perpendicular to Gibson Rd. Tightening turn radii would discourage higher speeds. In addition, this type of improvement at all the ramps would create a more pedestrian-friendly environment for teens traveling to and from Pioneer High School. As future development happens, consider bicycle and pedestrian facilities on the south side of Gibson Rd. It should be noted that the interchange is within Caltrans right-of-way. Therefore, Caltrans has authority over any improvements at the interchange intersections.

Lane width reduction between the SR 113 northbound ramp terminal intersection and County Road 102

This would include reducing inner through lanes to 10.5' and outer through lanes to 11'. This reduction could potentially allow for a 3-foot bike buffer.

Implement pedestrian improvements at Gibson Road/Pioneer Avenue

Given the large number of youth pedestrians crossing this intersection during school peak hours, consider special pedestrian settings to increase safety during these morning and afternoon school peak hours. This could include extending pedestrian crossing times, providing pedestrian recall on all phases, or implementing leading pedestrian intervals.

Red time and/or yellow time adjustment at all intersections

Thirty-one percent of the collisions at Gibson Road/Matmor Road occurred between vehicles that should not be crossing the intersection at the same time. The same thing occurred in 9 of the 12 collisions at Gibson Road/Ogden Road. Consider increasing phase red times to allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor. It should be noted that Caltrans operates and maintains the interchange intersections. All signal timing countermeasures at those intersections would have to be implemented by Caltrans.

East Street: Kentucky Avenue to Main Street

This portion of East Street borders primarily industrial and commercial land use on the east and railroad land use (backed primarily by industrial and commercial land use) on the west. Train tracks run parallel to East St to

the west. From 2009 to 2016, there were 209 crashes along or near this corridor, including 6 severe injury collisions and 1 fatality. About 1/4 of all collisions were caused by auto right-of-way violations, 1/4 by unsafe speed, and

1/4 by traffic signal/sign violations or improper turning. In total, there were 12 bicycle-related collisions, with 11 between Main St and Lemen Ave. Five of the 6 pedestrian-related collisions occurred at the East St/Main St intersection.

Corridor Collision Profile

Countermeasure Objectives:

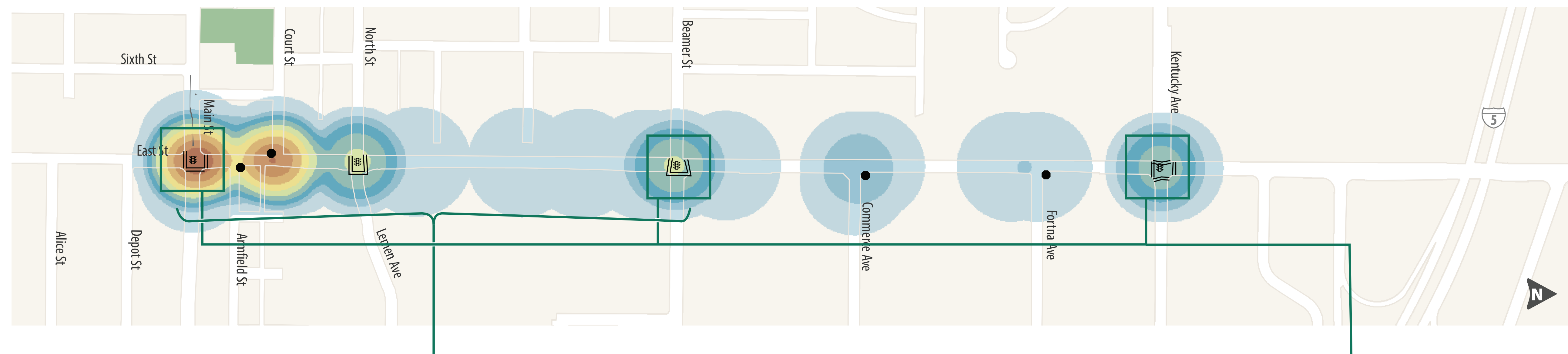
- Provide safer ingress and egress turning movements
- Make intersections safer for conflicting movements

What do we know about these collisions (2009-2016)?



In the Map:

- ⚡ Traffic Signal
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- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

Recent City intersection countermeasures

1. In mid-2012, Lemen Avenue was realigned to connect to North Street. The average number of collisions per year before the countermeasure was 2.6 collisions per year. This number dropped to 2.0 collisions per year after the countermeasure. The realignment also increased pedestrian safety by allowing for signalization and crosswalks on all intersection legs.
2. The City prohibited eastbound left-turns at the East Street/Court Street intersection in mid-2013. Between the time this countermeasure was implemented and through 2016, the crash rate dropped to about 4.0 collisions per year. Between 2009 and mid-2013, the crash rate was about 7.3 collisions per year.

Road diet between Main Street and Beamer Street

This would include reducing to a 3 lane cross-section, with 1 northbound lane, 1 southbound lane, and 1 two-way left-turn lane (TWLTL). This road diet could be extended to just north of Commerce Ave, where crash records indicate 3 unsafe speed rear-end collisions and 1 southbound left-turn vehicle colliding with a northbound through vehicle. This road diet would:

- Grant turning vehicles on East St separation from through traffic and allow them to focus on crossing only 1 vehicle lane. For example, northbound left-turns onto Court St would benefit from a road diet because they would be able to wait safely in the TWLTL and look for gaps in only 1 southbound vehicle lane, rather than stopping northbound through vehicles in their lane and waiting for a gap in 2 southbound vehicle lanes.
- Introduce two-stage gap acceptance, meaning that side street vehicles would only need to focus on 1 vehicle lane at a time when making a turning movement.

If a traffic analysis requires a 4 lane cross-section on East St through Court St, a median prohibiting northbound left-turns would be beneficial. Since the mid-2013 countermeasure prohibiting eastbound left-turns at East St/Court St, there have been 8 collisions involving northbound left-turns, southbound left-turns, or westbound left-turns. A median would also enforce the eastbound left-turn prohibition.

Red time and/or yellow time adjustment at all signalized intersections

At East Street/Lemen Avenue-North Street, 6 of the 8 post-realignment collisions occurred between vehicles that should not be crossing the intersection at the same time. At East Street/Beamer Street, 10 of 15 collisions occurred for the same reason. An additional 7 such collisions happened at Kentucky Avenue and 12 at East Street/Main Street. Consider increasing phase red times to allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

East Street: Main Street to Gibson Road

Between 2009 and 2016, 189 collisions occurred along or near East Street between Main Street and Gibson Road, resulting in 46 injuries from 39 separate incidents and in 2 fatalities. The major collision causes

included unsafe speed, automobile right-of-way violations, and traffic signals or signs violations. Almost 1/2 of all collisions were rear-end and almost 1/3 were broadside. There were 10 pedestrian-, 9 bicycle-, and 1

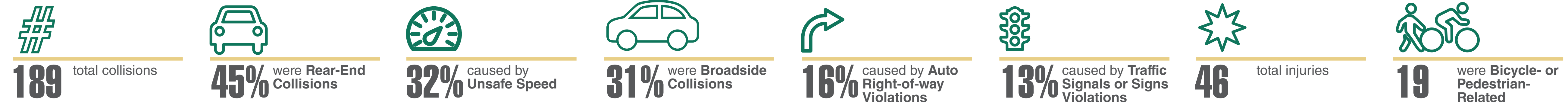
train-related collisions. Most collisions on this segment of East Street (86%) occurred within 100 feet of intersections, with 83% of these intersection collisions occurring at signalized intersections.

Corridor Collision Profile

Countermeasure Objectives:

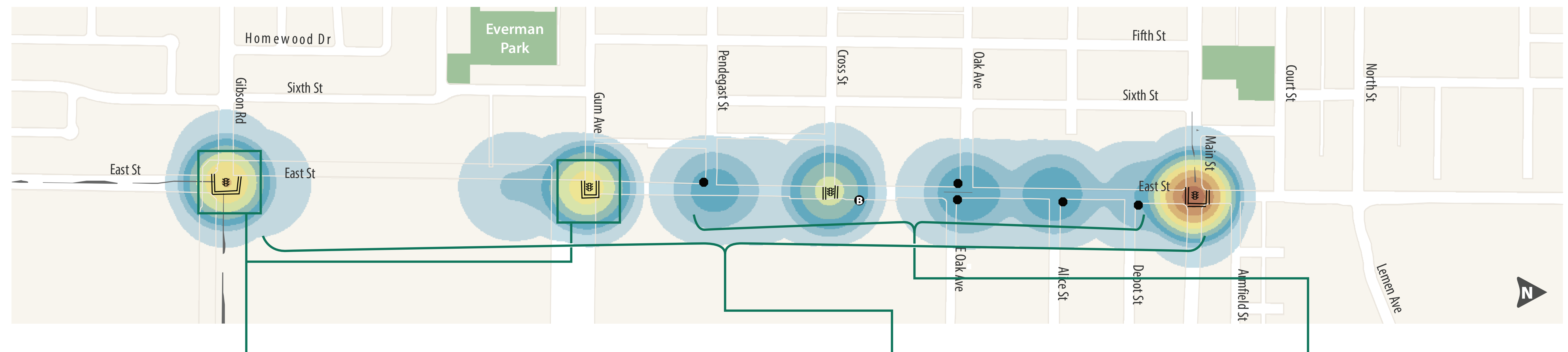
- Provide safe luminance
- Improve side-street safety
- Make intersections safer for conflicting movements

What do we know about these collisions (2009-2016)?



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- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

Red time and/or yellow adjustment at East St/Gum Ave and East St/Gibson Rd
 Thirty percent of the collisions at East St/Gibson Rd occur between vehicles that should not be crossing the intersection at the same time. That percentage is 40% at East St/Gum Ave. In addition, Gibson Rd/East St currently provides zero red time between phases in the same ring and only a half-second of red time between barriers in the ring-and-barrier diagram. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

At all signalized intersections, yellow and red times should be calculated with the assumption that all vehicles stop behind the train tracks on red.

Road diet between Main St and north of Gibson Rd
 This would include reducing to a three lane cross-section, with one northbound lane, one southbound lane, and one two-way left-turn lane (TWLTL). A road diet would grant turning vehicles separation from through traffic and introduce two-stage gap acceptance. These would be beneficial to the side streets and driveways along this corridor. The medians at East Street/Oak Avenue could be maintained as they are. East Street could widen to 4 lanes on the southbound approach to Gibson Road in order to match the cross-section of East Street south of Gibson Road.

Evaluate luminance along East St between Depot St and Pendegast St
 There were 17 non-DUI collisions that occurred on this segment during the night-time, dusk, or dawn. Of the 17 collisions, 13 involved southbound vehicles or bicyclists, and 8 occurred within 100' of East St/Cross St. Along East St, there are no street lights on the west side of the road between Main St and Pendegast St, with the exception of lights at Main St, Cross St, and Pendegast St. In addition, the land use adjacent to East St on the west side is likely to produce little ambient light. Luminance should be evaluated using the lighting design criteria published by Illuminating Engineering Society (IES). Alternatively, the City may use its own lighting design requirements.

West Street: Kentucky Avenue to Main Street

This corridor is mostly residential north of Court St and commercial to the south, with Woodland High School along the west side between Woodland Ave and Beamer St. There were 151 collisions (2009-2016), resulting in 42 injuries

from 31 crashes. About 88% of collisions occurred within 100' of intersections. The leading causes were unsafe speed, auto right-of-way violations, improper turning, and traffic signal or sign violations. West St intersections

most prone to collisions were (in order) Beamer St, Main St, Woodland Ave and Court St. Bike lanes were restriped and vehicle lanes narrowed on the northbound and southbound approaches in 2013, and on the westbound approach in late 2016. These effects are not reflected in the data.

Corridor Collision Profile

Countermeasure Objectives:

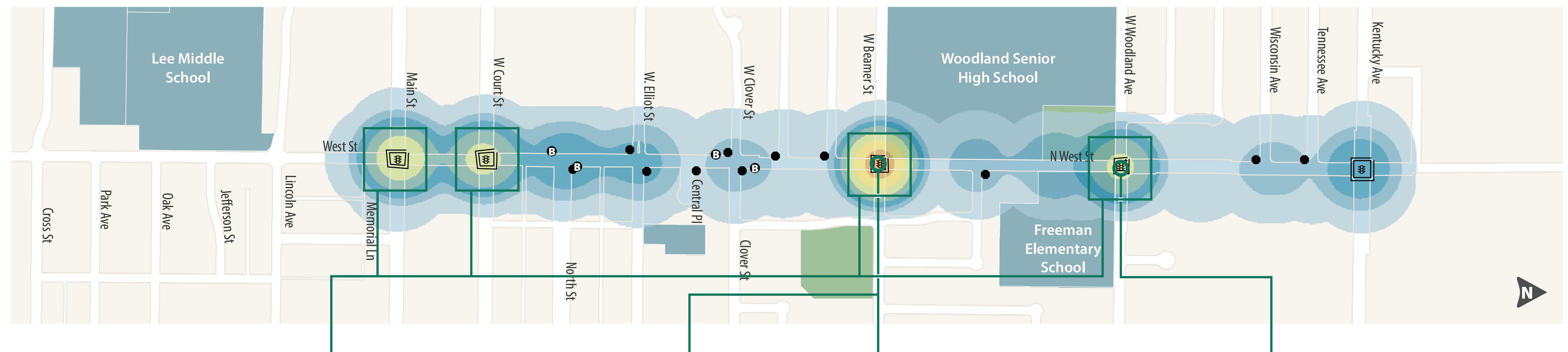
- Improve youth/pedestrian safety
- Make intersections safer for conflicting movement

What do we know about these collisions (2009-2016)?



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Countermeasures

Red time and/or yellow adjustment at West Street intersections with Woodland Avenue, Beamer Street, Court Street, and Main Street.

Between 15% and 30% of the collisions at these 4 intersections occur between vehicles that should not be crossing at the same time. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

Install bulbouts and/or dual curb ramps at West Street/Beamer Street intersection

In order to improve pedestrian safety, especially for teenagers walking to and from Woodland High School, bulbouts and/or dual curb ramps are recommended. Both of these countermeasures would serve to reduce pedestrian crossing distances and make drivers aware of which crosswalk pedestrians intend to use before they step out on the road.

Implement pedestrian improvements at West Street/Beamer Street

Given this intersection's proximity to Woodland High School, consider special pedestrian settings to increase safety during morning and afternoon school peak hours. This could include extending pedestrian crossing times, providing pedestrian recall on all phases, or implementing leading pedestrian intervals.

Convert left-turns to protected left-turn phasing at all approaches of the West St/Beamer St intersection

At least 43% of collisions at West St/Beamer St were due to the dynamics of permitted left-turns. This includes 15 collisions between left-turning vehicles and opposite-direction through vehicles. Switching to protected left-turn phasing could eliminate the potential for these collisions. Protected left-turn phasing would require restriping all intersection approaches to have left-turn pockets, as well as new signal heads, poles, and mast arms.

Upgrade signal infrastructure to include a mast arm and second signal head on west and east legs of West St/Woodland Ave

It is recommended that a new pole with mast arm be used to better indicate permitted left-turn phasing. Mast arms are typically recommended at suburban intersections such as West St/Woodland Ave.

Conversion to protected left-turn phasing on the north and south approaches of West St/Woodland Ave should be considered

At this intersection, about 25% of collisions were between northbound or southbound left-turning vehicles colliding with same- or opposite-direction through vehicles. Conversion to protected left-turn phasing should be considered. This would include restriping the two approaches to have left-turn pockets, as well as new signal heads, poles, and mast arms.

West Street: Main Street to Gibson Road

West Street is commercial between Main Street and Lincoln Avenue, but becomes residential south of Lincoln Avenue to Gibson Road. In all, there were 42 collisions resulting in 14 injuries from 9 separate crashes. Three

of the injuries resulted from pedestrian-involved collisions. The most common collision types were rear end, broadside, sideswipe, and hitting objects. The top collision causes were unsafe speed, traffic

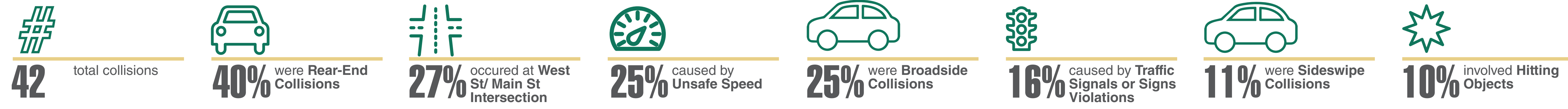
signal/signs violations, auto right-of-way violations, and improper turning. There were 8 youth collisions along this corridor during school hours, including 1 involving a youth bicyclist and 1 involving a youth pedestrian.

Corridor Collision Profile

Countermeasure Objectives:

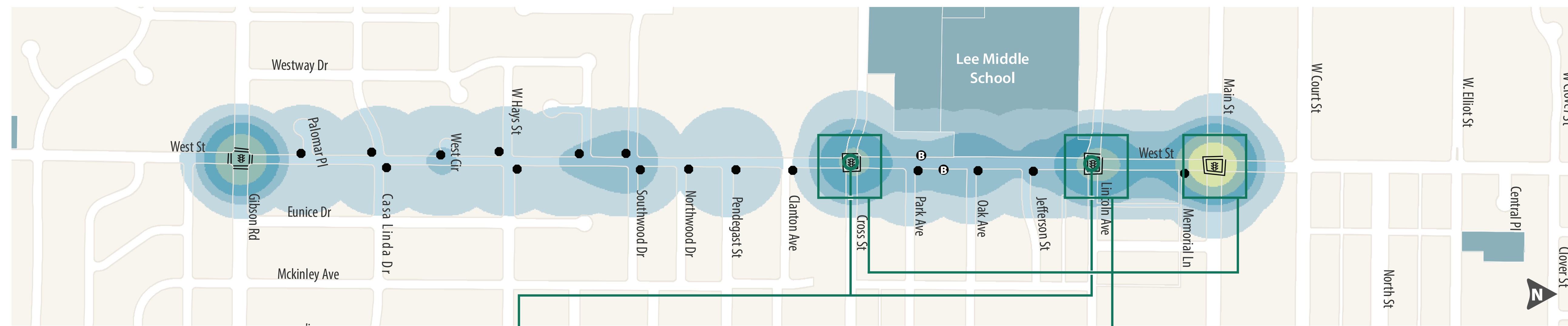
- Improve pedestrian safety
- Make intersections safer for conflicting movements

What do we know about these collisions (2009-2016)?



In the Map:

- ⚡ Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
 - * Flashing Beacon
 - ⊕ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

The following countermeasures were recently implemented by the City
The City of Woodland narrowed vehicle travel lanes to 10-11 feet and restriped bike lanes on West Street between Main Street and Cross Street in 2013.

Implement pedestrian improvements at West Street/Lincoln Avenue and West Street/Cross Street

Given these intersections' proximity to Lee Middle School, consider special pedestrian settings to increase safety during morning and afternoon school peak hours. This could include extending pedestrian crossing times, providing pedestrian recall on all phases, or implementing leading pedestrian intervals.

Red time and/or yellow adjustment at West Street intersections with Main Street, Lincoln Avenue, and Cross Street

About 25% of all the collisions at these 3 intersections occurred between vehicles that should not be crossing at the same time. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

Main Street: West Street to East Street

Main Street from West Street to East Street contains an important part of Woodland's downtown core. The City has made efforts in recent years to address the bicycle- and pedestrian-related collisions on Main

Street, having implemented various safety measures such as sharrows and bulbouts. Countermeasures are outlined below. Between 2009 and 2016, there were 278 collisions, with most primarily caused by

unsafe speed or auto right-of-way violations. There were 49 total injuries from 42 separate incidents, and 2 fatalities. Almost 1/2 of all collisions were rear-end and about 1/4 were broadside.

Corridor Collision Profile

Countermeasure Objectives:

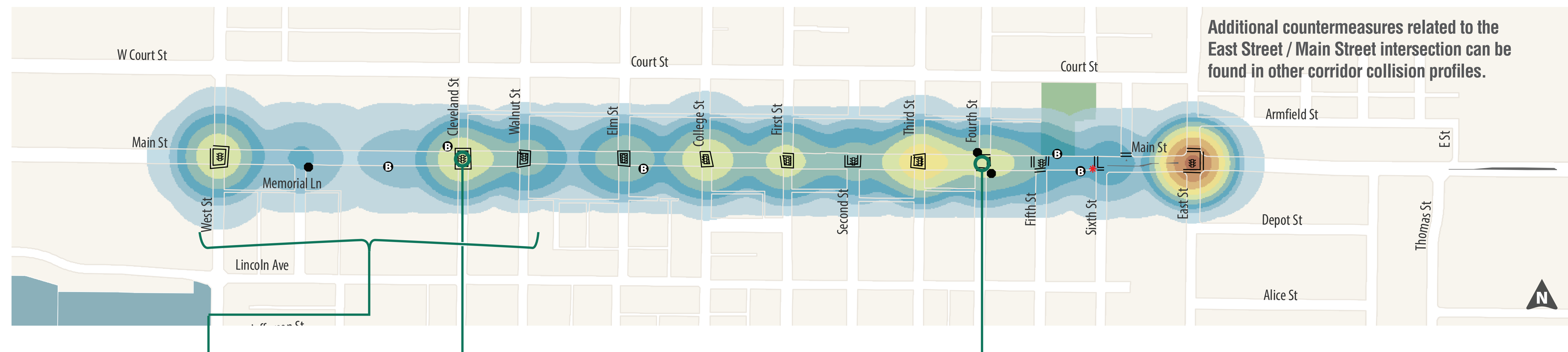
- Reduce speeding
- Make intersections safer for conflicting movements
- Improve pedestrian safety

What do we know about these collisions (2009-2016)?



In the Map:

- ⚙️ Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
 - ★ Flashing Beacon
 - Ⓟ Bus Stop
- Low (1) COLLISION INTENSITY High (20)



Countermeasures

Road diet between West St and Walnut St

This would include reducing to a three lane cross-section, with one eastbound lane, one westbound lane, and the existing two-way left-turn lane (TWLTL). In addition, bike lanes would be added on both sides of Main Street, and there would be potential for new on-street parking where appropriate.

Red time and/or yellow time adjustment at Cleveland St

Nine collisions occurred between vehicles that should not be in the intersection at the same time. The signal infrastructure was upgraded in summer 2016 to include full mast arms and appropriate signal heads. Based on post-improvement signal timings, red time is either 0 or 0.5 seconds, depending on the phase. Consider increasing phase red times to allow extra time for vehicles to clear the intersection. Speed surveys could also be completed to establish more appropriate yellow times. Special consideration should be given to southbound vehicles because of potential corner sight distance issues related to River City Bank's proximity to the roadway. For safety reasons, red times should be consistent at all signals in a corridor.

Realign 4th Street to allow safer turning movements or build a median to restrict through movements and certain turn movements

Seven collisions occurred in which side-street vehicles were trying to access or cross Main Street. Five of these collisions occurred when southbound through vehicles collided with eastbound vehicles.

Add high visibility or textured treatments at Main St crosswalks

This treatment would improve pedestrian safety and potentially aid in reducing unsafe speed collisions. An example of textured treatment in Woodland was implemented by the City at the crosswalks of Main Street/5th Street.

The following countermeasures were implemented by the City in mid-2015. (1) Bulbouts on SE, NW, and NE corners, and sharrows at Main St/Walnut St.; (2) sharrows, textured midblock crosswalk, choker and on-street parking on the north side, and chicane on south side on Main St between Walnut St and Elm St; (3) bulbouts on every corner and a sharrow at Main St/Elm St; (4) bulbout on SE corner of Main St/3rd St and sharrows; (5) bulbouts on SW, SE, and NE corners, sharrows, and an east-leg crosswalk at Main St/4th St; (6) signalization, bulbouts on all corners, sharrows, and textured crosswalks on all legs at Main St/5th St; (7) bulbout on SW quadrant and on north side of Main St west of 6th St (east), textured crosswalk on south leg, sharrow, and pedestrian flashing beacon on new, high-visibility west crosswalk. When looked in the aggregate, the data shows that the average number of collisions at these intersections reduced from 10.7 collisions per year to 8.7 collisions per year after countermeasures were implemented.

Main Street: East Street to I-5 Northbound Off-Ramp

East of East St, Main St transitions from downtown area to a commercial/retail corridor with access to the SR 113 and I-5. From 2009 to 2016, there were 462 collisions, including 111 injuries from 82 separate crashes. Seven of the

injuries were "severe," and there was 1 fatality. Compared to the other corridors, a relatively low percentage of collisions (53%) occurred within 100' of intersections, mainly at Pioneer Avenue, East Street, and the SR 113 southbound

ramps. More than 1/2 of all collisions (55%) were rear-end and 23% were broadside. The leading collisions causes were unsafe speed (44%) and auto right-of-way violations (16%). There were 32 bicycle- or pedestrian-related collisions.

Corridor Collision Profile

Countermeasure Objectives:

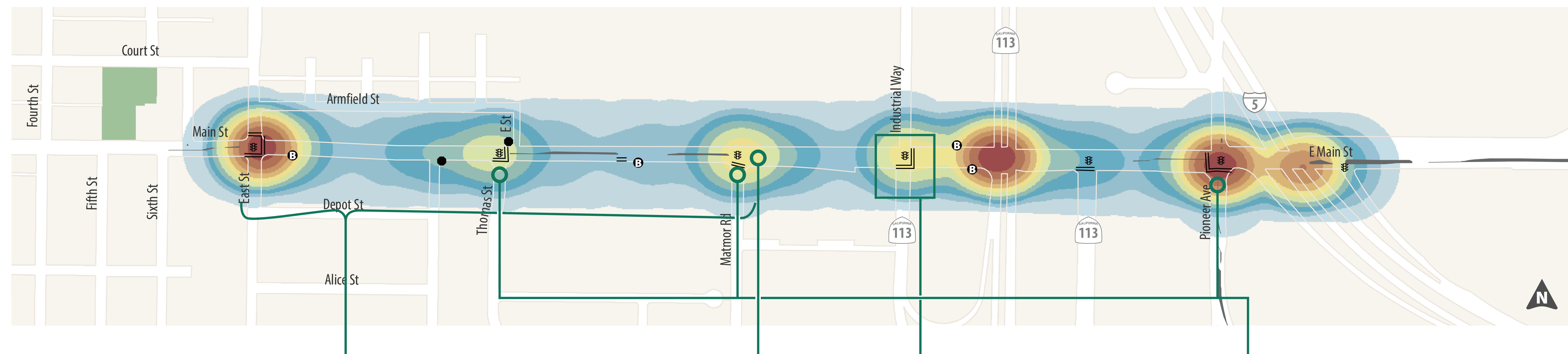
- Reduce speeding
- Improve bicycle/pedestrian safety and connectivity
- Make intersections safer

What do we know about these collisions (2009-2016)?



In the Map:

- Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
 - * Flashing Beacon
 - ⊕ Bus Stop
- Low (1) COLLISION INTENSITY High (20)



Countermeasures

Add an eastbound bike lane between East St and east of Matmor Rd

The E. Main Street Improvement project will include this bicycle lane. The draft project description also states that a bulbout will be built on the SE corner of Main St/Matmor Rd. This would eliminate the northbound free right-turn movement and acceleration lane, increasing safety for eastbound bicyclists.

Build a lower-stress facility along the north side of Main St through this corridor*

Even with an existing westbound bike lane, 8 bicycle collisions occurred due to wrong-side (contraflow) driving on the eastbound bike lane. Factors creating a higher-stress bike facility on the north side of Main St include:

- A westbound bike-lane gap between the I-5 northbound ramp and Pioneer Ave
- Dirt/gravel space adjacent to the bike lane

Install raised median to prevent westbound left-turn into gas station.

and varying bike lane width

- The westbound bike lane ending 160' before reaching Main Street/East Street

The E. Main Street Improvement project will help ameliorate these issues by:

- Adding a multi-use, off-road pathway between Matmor Road and Pioneer Avenue on the north side of Main Street
- Closing the westbound bike-lane gap between the

Red and/or yellow time adjustment at Industrial Wy/ SR 113 SB ramps *

Twelve collisions were between vehicles that should not be in intersections concurrently. Consider increasing phase red times to allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

- I-5 northbound off-ramp and Pioneer Ave. **
- Continuing the westbound bike lane to the East Street/Main Street intersection stop line **
- Reducing vehicle lane widths, which would require restriping the bike lane. This would lower speeds and encourage use of the bike lane.

** On the westbound approach of this intersection, green paint will be used to highlight the bike-vehicle conflicting area, bike lane, and bike box.

Redesign northbound approaches at Thomas Street, Matmor Road, and Pioneer Avenue to help get bicycles to the north side of the road

At Thomas Street, this would include either a sharrow marking or restriping the northbound approach as 1 left-turn lane, a bike lane, and 1 right-turn lane. At Matmor Road, this would include a bike lane.

Retime all signals to consider bicycle movements *

This would be necessary if the other bicycle improvement recommendations are implemented.

* Caltrans operates and maintains the interchange intersections. All signal timing and roadway modification countermeasures at those intersections would have to be implemented by Caltrans.

Pioneer Avenue: Main Street to Gibson Road

From 2009 to 2016, there were 173 collisions on this corridor, resulting in 52 injuries from 36 separate incidents and 1 fatality. About 1/3 of collisions were caused by unsafe speed and another 1/3 by either improper

turning, traffic signals/signs violations, auto right-of-way violations, or wrong side of the road movements. The four major types of collisions were rear-end (43%), broadside (19%), sideswipe (13%), and hit object (13%).

Pioneer is a north-south arterial that is also a primary access road to Pioneer High School. There were 41 collisions involving youth drivers, bicyclists, or pedestrians, with 21 of these happening during school hours.

Corridor Collision Profile

Countermeasure Objectives:

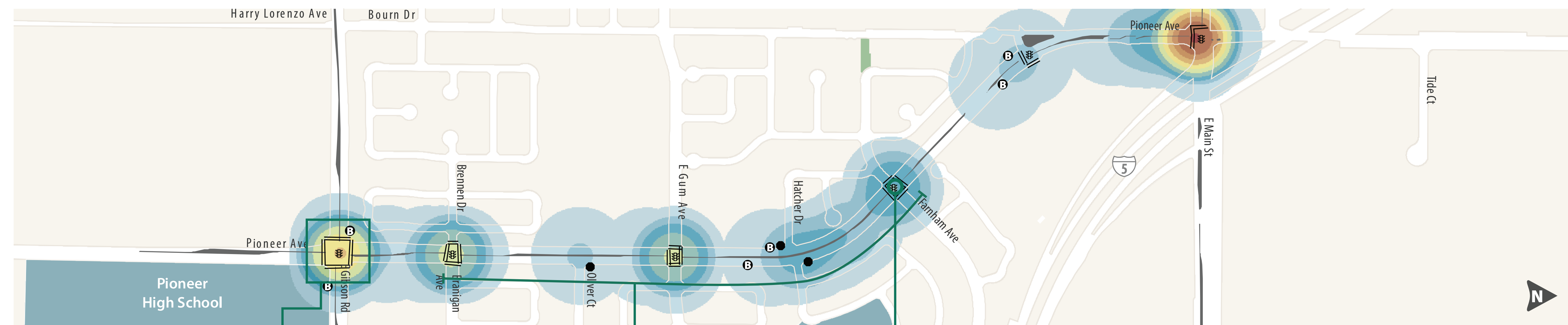
- Increase bicycle safety
- Make intersections safer
- Enhance youth safety

What do we know about these collisions (2009-2016)?



In the Map:

- ⚡ Traffic Signal
 - Stop Sign
 - Crosswalk
 - Median
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 - Ⓟ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Countermeasures

Implement pedestrian improvements at Gibson Road/Pioneer Avenue

Given the large number of youth pedestrians crossing this intersection during school peak hours, consider special pedestrian settings to increase safety during these morning and afternoon school peak hours. This could include extending pedestrian crossing times, providing pedestrian recall on all phases, or implementing leading pedestrian intervals.

Add buffered bike lanes from north of Farnham Avenue to south of Branigan Avenue

This would require lane width reduction of through lanes. Lane width reduction would have the added benefit of reducing vehicle speeds on this portion of Pioneer Avenue.

Red time and/or yellow time adjustment at Pioneer Ave/Farnham Avenue

Three southbound drivers, including 1 bicyclist, collided with eastbound or westbound vehicles. These vehicle movements should not occur at the same time. Consider increasing phase red times to allow extra time for vehicles to clear the intersection. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.