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# Broken Arrow

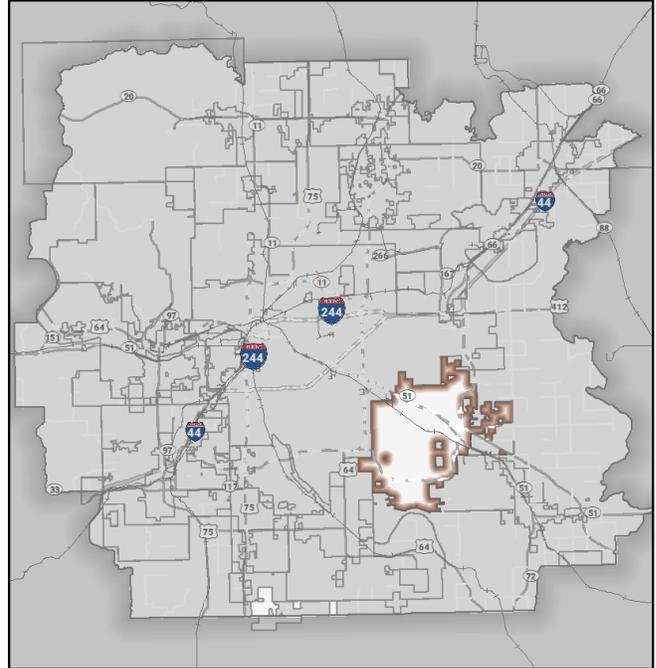
## Community Overview

Broken Arrow is a rapidly growing suburb of Tulsa, the largest city after Tulsa in the INCOG Transportation Management Area and has the third largest number of employers in the state. Population swelled from around 12,000 in 1970 to 75,000 in 2000 and in 2015 is just over 100,000 residents. Further undeveloped land remains within the city's boundaries, and it is likely Broken Arrow will continue to add population and spread development eastward.

The city is predominantly suburban style single-family home development which was built during the boom in population. Commercial uses are mostly located along major arterial streets, large medical employers line the Expressway, and industrial uses are clustered along the rail line that parallels the Expressway.

In 2005, the City adopted a downtown revitalization plan that focused on drawing more residents to work, stay and recreate in Broken Arrow. Since 2005, over \$64 million has been invested in rehabilitating and constructing buildings. More construction activity has occurred in downtown in the last five years than in the previous fifty. The "Rose District" is a vibrant arts and entertainment district.

Broken Arrow has recognized the importance of creating a walkable downtown district to attract visitors and businesses. Main Street has been the focus of these efforts in the "Rose District" with streetscape changes to improve the pedestrian experience such as wider sidewalks, curb extensions and midblock crossings. Decorative



pavers, pedestrian-scale lighting and planters also add to the streetscape. The street was narrowed from four lanes to three in 2014 as part of the sidewalk widening project from College Street to Fort Worth Street. As growth has happened in other parts of the city, some developments have included sidewalks, but land use remains divided between residential uses inside of the arterial grid, and others on it.

The Creek Turnpike Trail runs along the Turnpike from Northeastern State University in the east to the Tulsa border in west, continuing along through Tulsa until reaching the Arkansas River. The trail is accessed today mostly by automobile since access points are not along bicycle- or pedestrian-friendly roads close to residential locations.

## Walkshop Summary

The Broken Arrow walkshop was conducted on April 3, 2014 and attended by more than 25 people representing City staff, elected officials, community members, INCOG staff and the media. The group explored issues within the one block area of Commercial Street north to Broadway Avenue west to Ash Avenue then back south to

Commercial Street. This is part of the successful Rose District revitalization, but participants noted that there are not good connections between downtown and the rest of the city. The following comments were priorities for improvement expressed during the walkshop:

### Identified Issue:

The Broken Arrow Performing Arts Center located south of the study area at Main and Houston is a cultural draw for the community. Unfortunately, it is separated from the Rose District of Main Street by a rail road track. A safe at-grade crossing should be studied and installed to provide good bicycle and pedestrian access between the PAC and the after event restaurants north of the tracks.

### Response:

This site is included in the plan as a focus area with recommendations in the following pages..

### Identified Issue:

The Rose District is located 5 blocks west of North Intermediate High School. Most of that school's vehicular traffic runs north-south on Lynn Lane (177th E Ave) but a strong pedestrian connection should be considered along West 6th Street from the back of the school to Main Street.

### Response:

While this school closed at the end of the 2014 school year, other use of the property is proposed. In addition, connections to Broken Arrow High School are included in the network plan. Sidepaths along N 23rd Street and Kenosha Street would connect the school site to low-volume neighborhood routes that access Main Street. The Plan network links to all schools in the City.

### Identified Issue:

A future regional trail will run north-south along Lynn Lane just 8 blocks east of Main Street. Connection to this trail will link the Rose District to the greater Tulsa trail system which includes access to the Tulsa River Trail.

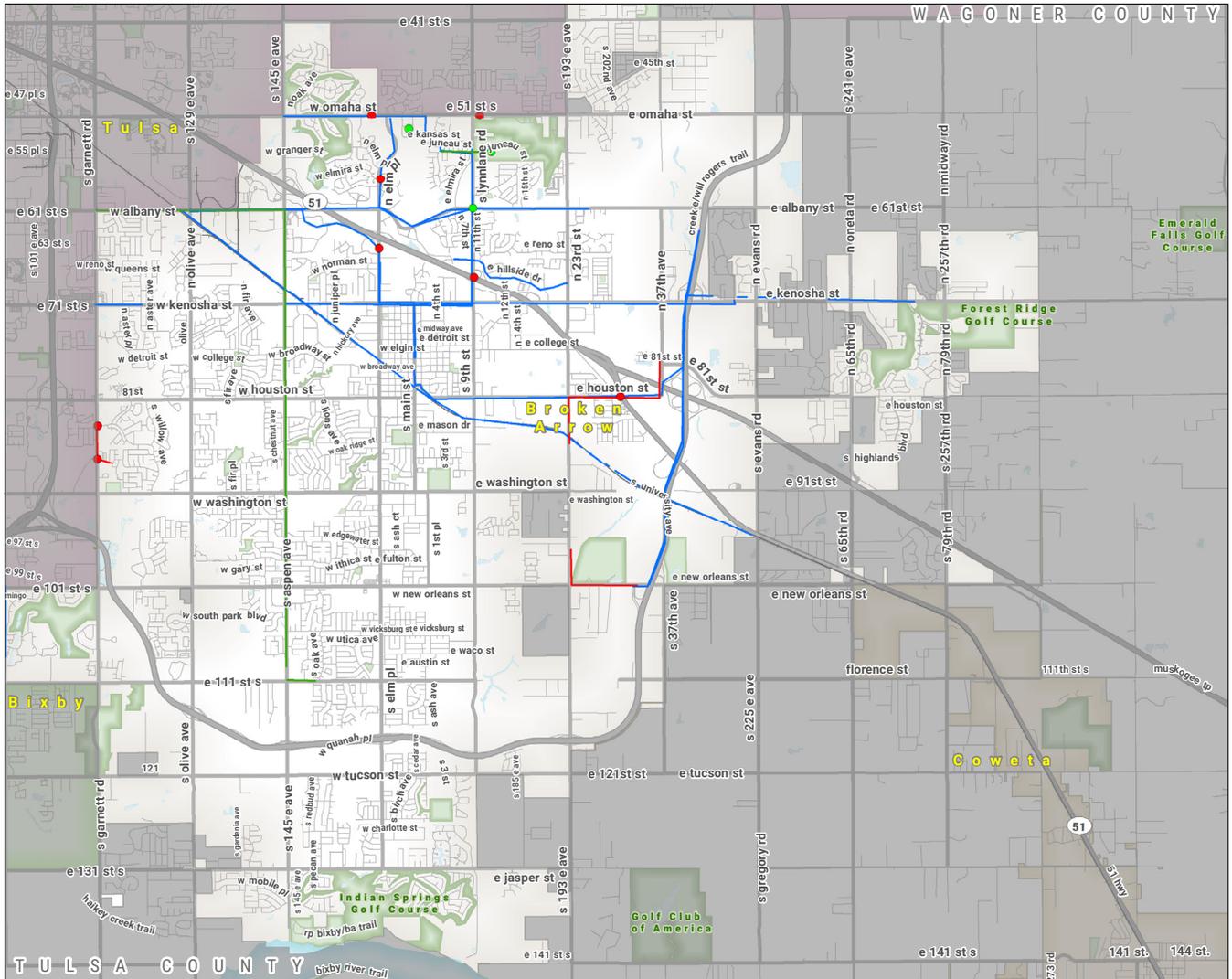
### Response:

This recommendation was incorporated into the bike network as a sidepath. A signed neighborhood route connects the Rose District (Main Street) to Lynn Lane along Detroit Street.

# WikiMap Summary

There were 19 registered users of the WikiMap who indicated a home zip code in Broken Arrow, four of whom added comments to the map. Most interest focused on improving bicycle access for longer distance routes such as a trail along the Union Pacific railroad line that parallels the BA

Expressway to connect to Tulsa. Most bicycle routes that residents would like to ride today have too much high-speed traffic to feel comfortable. This indicated a desire for facilities on these roads that provide more separation from traffic.



User:~bap~harper@comcast~bap~ Path:~bap~os~DIACTIVE PROJECTS\41 Tulsa Regional Bike & Ped Master Plan\GIS\MXD\010158\_August\Tulsa\_Plan\_Map\_Community\_Focus\_Areas.mxd~bap~

### Wiki Point Comments

- Destination
- Barrier

### Wiki Route Comments

- Desired Route
- Good Route
- Poor Route

## Policy Review and Recommendations

Broken Arrow's zoning code and subdivision ordinance both call for the provision of sidewalks on both sides of all streets, regardless of classification. Additionally, connectivity to an existing trail is required of a developer when the trail is within a quarter-mile of the development site.

Though Broken Arrow has achieved reasonably comprehensive sidewalk coverage throughout the City as a result of these codes, there are still numerous small segments of missing sidewalk which City staff acknowledged at the project retreat. These occur most often on arterial streets where sidewalk may be present on one side of the street and at arterial intersections with commercial uses. Sidewalks end where driveways or parking lots are present, and these represent major barriers to pedestrian connectivity, especially for those with mobility impairments.

Existing standards in Broken Arrow's Engineering Design Criteria Manual call for four-foot sidewalks on residential streets and five-foot sidewalks on arterials. There is no specification for bicycle facility design other than requiring eight-foot trails and ten-foot trails when federal funding is used.

### Recommendations:

- Consider adopting design guidelines for pedestrian and bicycle facilities outlined in the GO Plan.
- Consider revising trail connectivity requirement to specify type of facility necessary to connect to trail. Work toward retrofitting of existing residential developments near trails to add pedestrian and bicycle connections.
- Consider adopting a strong policy regarding access management on commercial corridors that includes driveway consolidation and shared parking to provide more consistent sidewalk or sidepath that improves the pedestrian and bicyclist experience by reducing traffic conflicts. Prioritize consolidation in areas of high pedestrian and bicyclist volume, and in locations of sidepath recommendations.

# Pedestrian Network Recommendations

The pedestrian facility recommendations in this Plan comprise two elements: a prioritization of known sidewalk gaps on arterial streets and specific infrastructure recommendations for the community's chosen focus areas. Two focus areas were selected for Broken Arrow: Kenosha Street from County Line Road to S 209th East Avenue, and N Main Street from the farmers market to the Performing Arts Center.

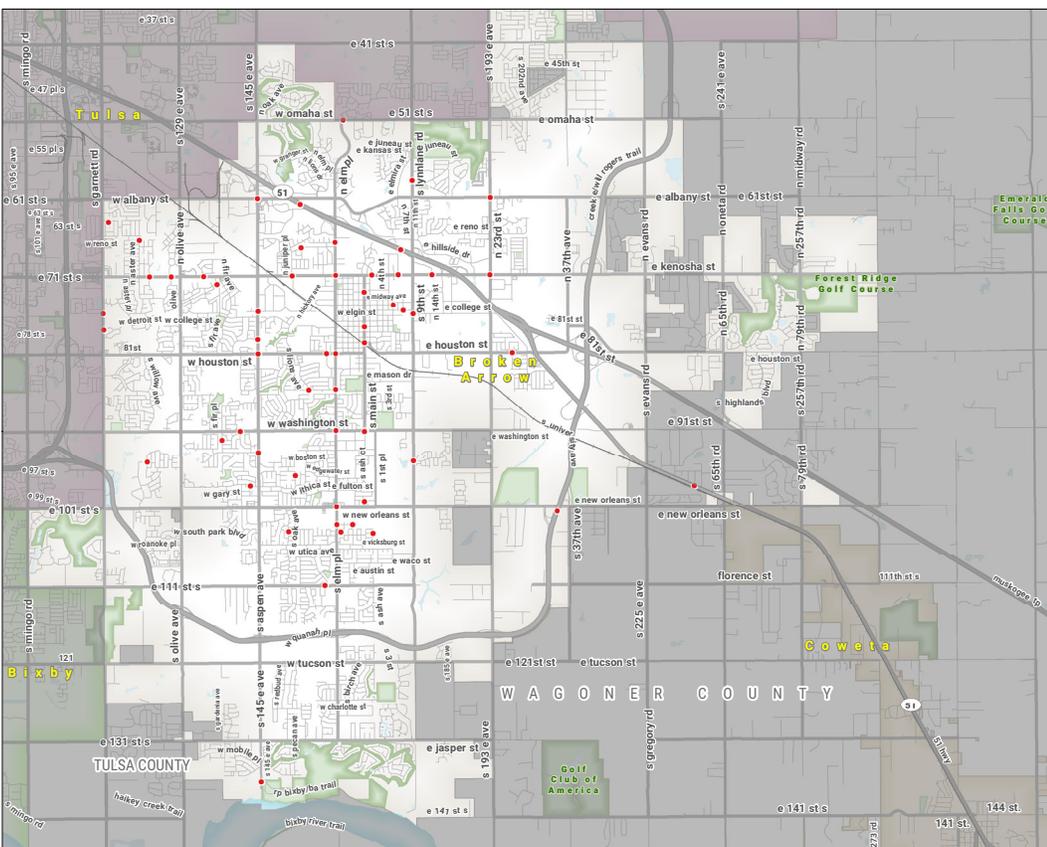
The map and project list below detail a prioritized set of improvements to fill sidewalk gaps on arterials. Arterial sidewalk gaps are targeted because these streets have the highest traffic volumes and speeds, but also many destinations for pedestrians, as well as some transit routes. Over 70% of the of the 50 pedestrian crashes reported in Broken Arrow in the five years ending July 2014 were located on arterial streets.

While filling sidewalk gaps on arterials may reduce the number of vehicle-pedestrian crashes, many conflicts actually occur at

intersections. Recommended treatments for arterial intersections appear in Appendix A: Design Guidelines and in Chapter 3: Pedestrian Strategy where some typical safety improvements for major arterial intersections are presented in the concept designs.

As can be seen below, Broken Arrow's existing sidewalk construction requirements have effectively supplied the City with sidewalk coverage on arterial streets. This map does not identify the important short gaps mentioned above, and a survey of these locations would be an appropriate next step toward improving pedestrian connectivity in the city.

Additionally, pedestrians will also benefit from implementation of the sidepath and trail recommendations detailed in the bicycle network below.

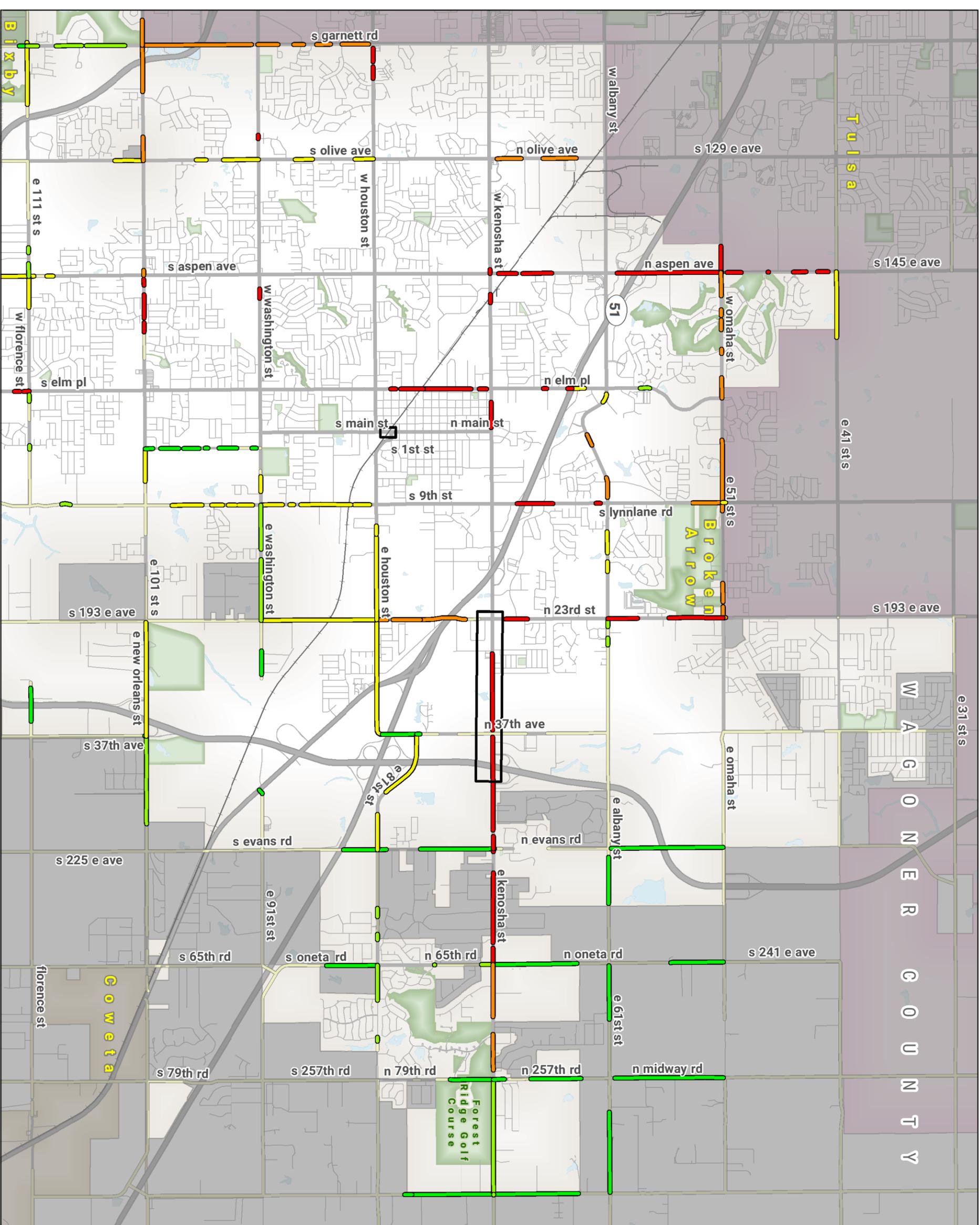


# Pedestrian Improvements

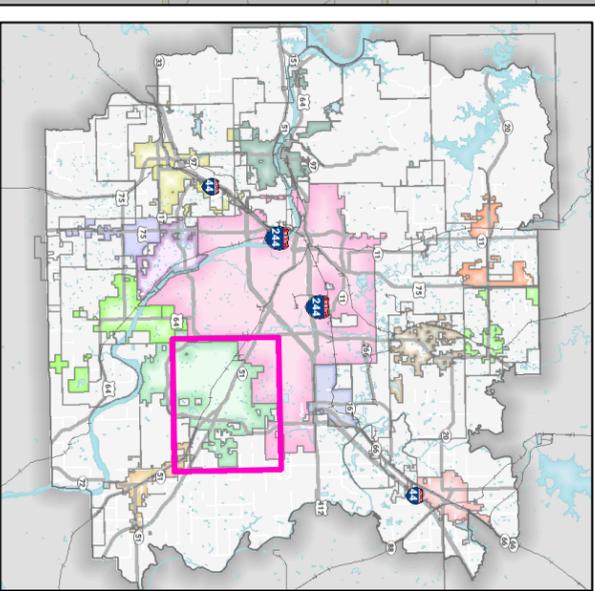
## 8/26/2015

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### Broken Arrow 1



- Prioritized Sidewalk Gaps by Quintile**
- 1
  - 2
  - 3
  - 4
  - 5
- Outside Jurisdiction
- Focus Area



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0 0.8 1.6 Miles

Date: 8/26/2015



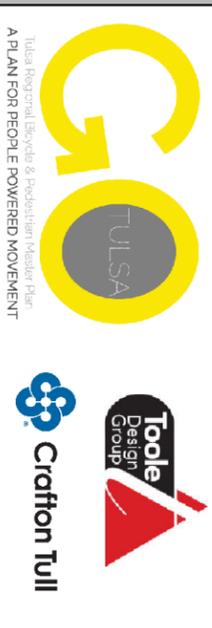
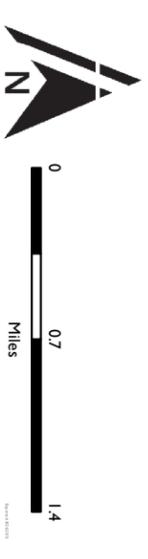
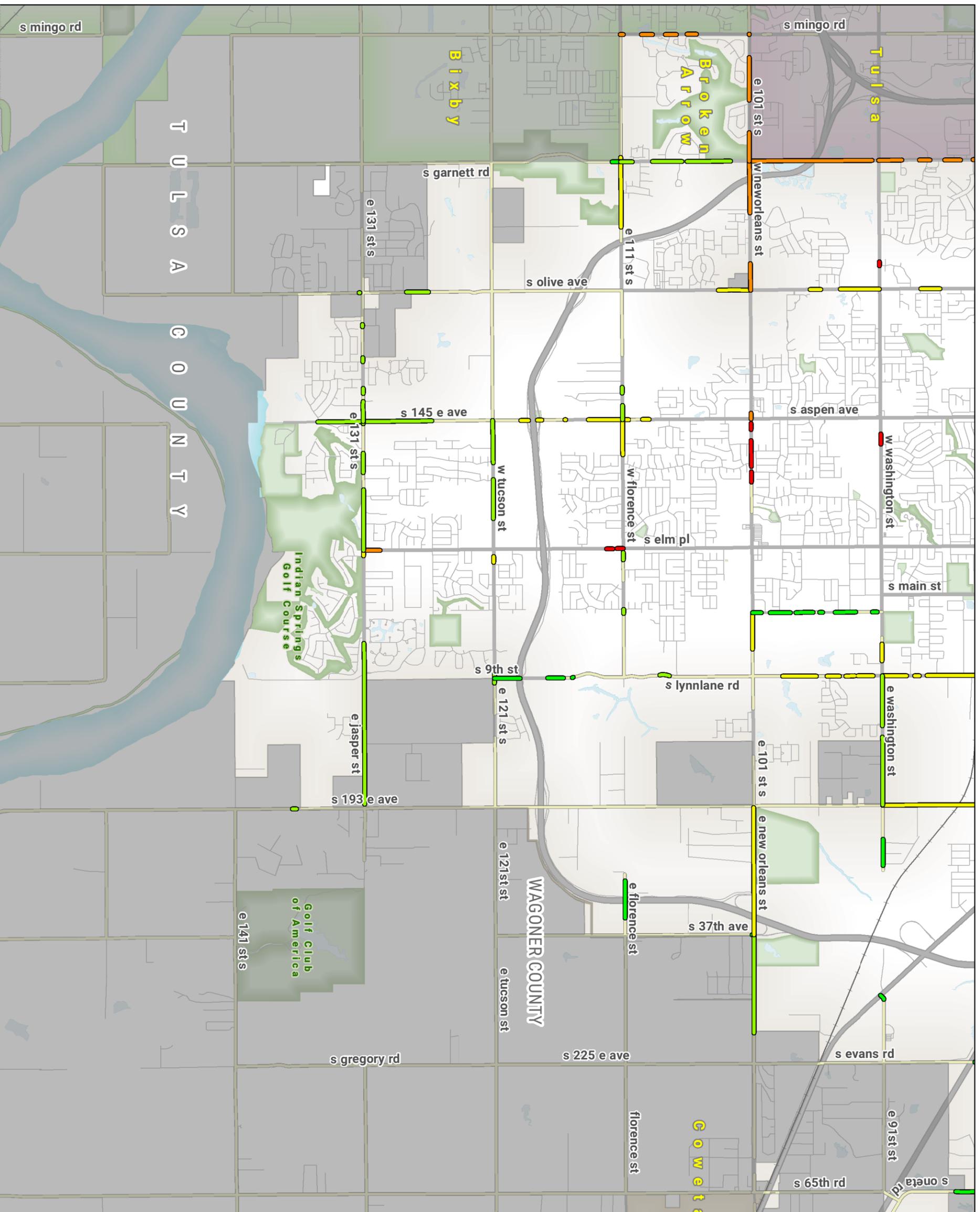
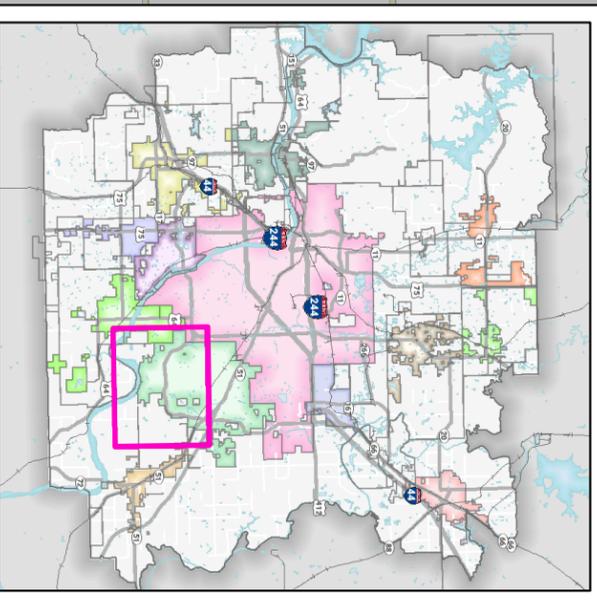
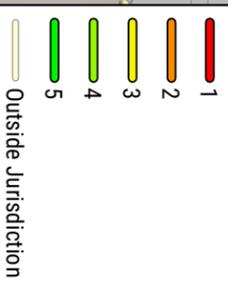
# Pedestrian Improvements

## 8/26/2015

Tulsa Regional Bicycle & Pedestrian Master Plan

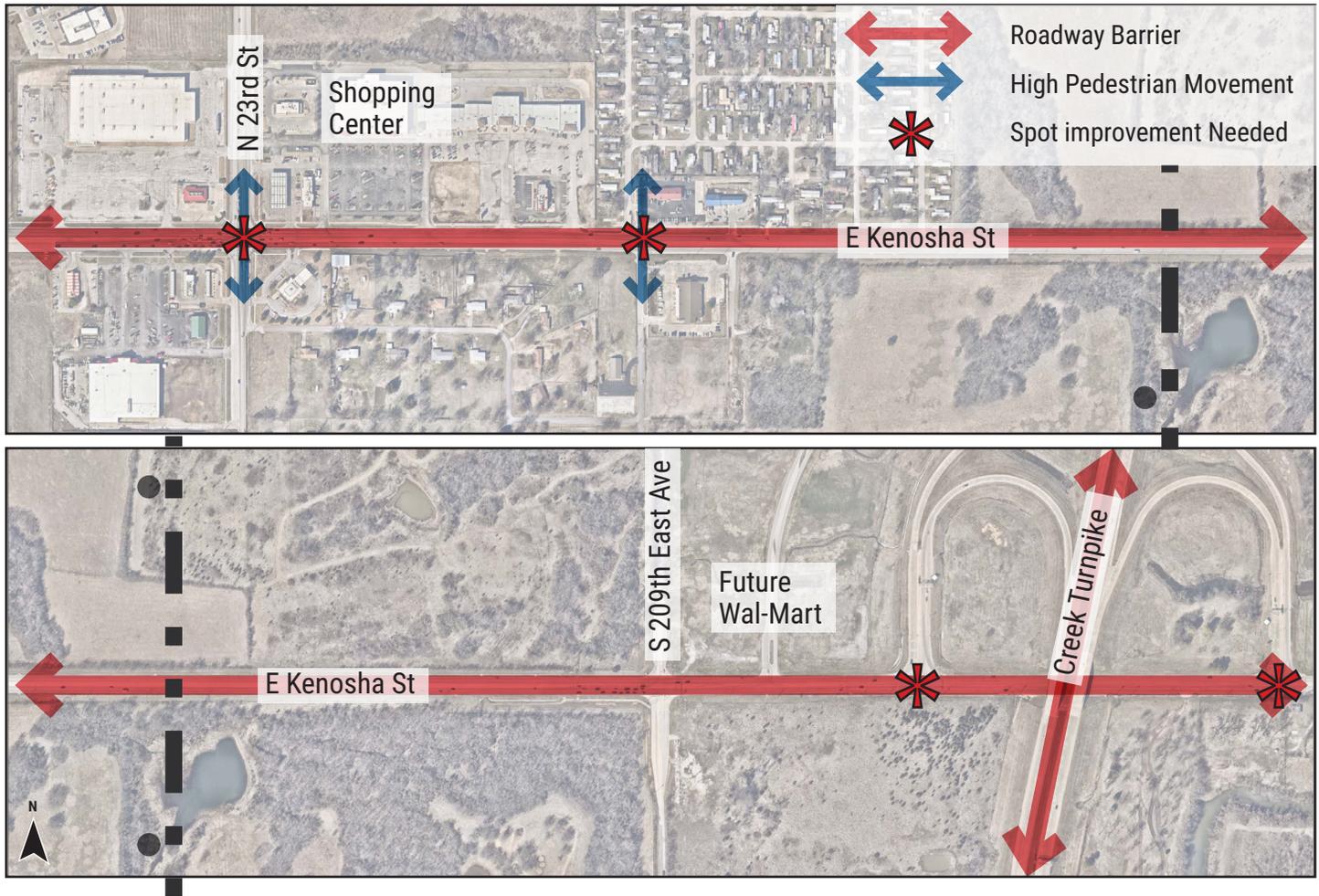
### Broken Arrow 2

Prioritized Sidewalk Gaps by Quintile



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## EAST KENOSHA STREET BETWEEN 23RD STREET AND THE CREEK TURNPIKE



### Why is this a focus area?

- East Kenosha is a gap in the bicycle and pedestrian network that could connect the existing and proposed Creek Turnpike Trail from Tulsa to Broken Arrow and the neighboring areas
- East Kenosha is a busy 5 lane arterial that has declining suburban strip and big box development along it, but is planned to have a new Wal-Mart and outparcel development near the Creek Turnpike
- Lack of connected sidewalk network
- No bicycle facilities connecting Camino Villa neighborhood to East Kenosha
- Dangerous intersections to cross East Kenosha
- No crosswalks or sidewalks to cross under the Creek Turnpike or cross the on-off ramps of the Turnpike
- One bicycle crash occurred on Kenosha Street between July 2009 and July 2014



Typical section of E Kenosha Street



No sidewalks under the Creek Turnpike

# EAST KENOSHA STREET BETWEEN 23RD STREET AND THE CREEK TURNPIKE

## Proposed solutions

- Install a wide sidepath along the north side of East Kenosha Street to allow bicycle and pedestrian use and connect to regional trail network
- Add a mid-block crossing with HAWK signal at the intersection of East Kenosha and North 27th Street
- Add sidewalk with buffer and street trees on the south side of East Kenosha Street
- Add high visibility crosswalks at the intersection of East Kenosha and North 23rd Street
- Add push button detection, sidewalks, and crosswalks at the on-off ramps of the Turnpike and under it

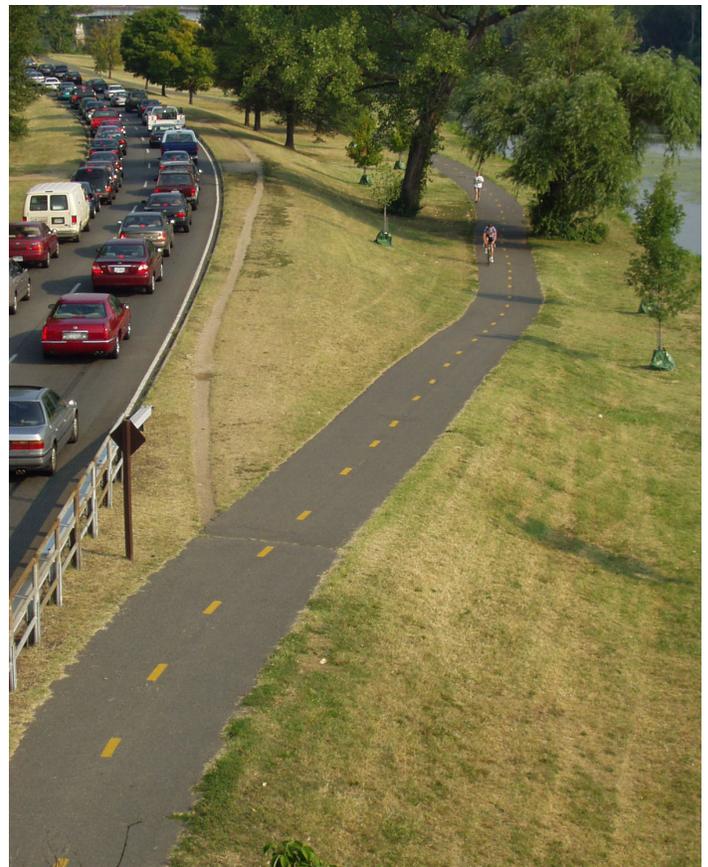


HAWK signal at mid-block crossing

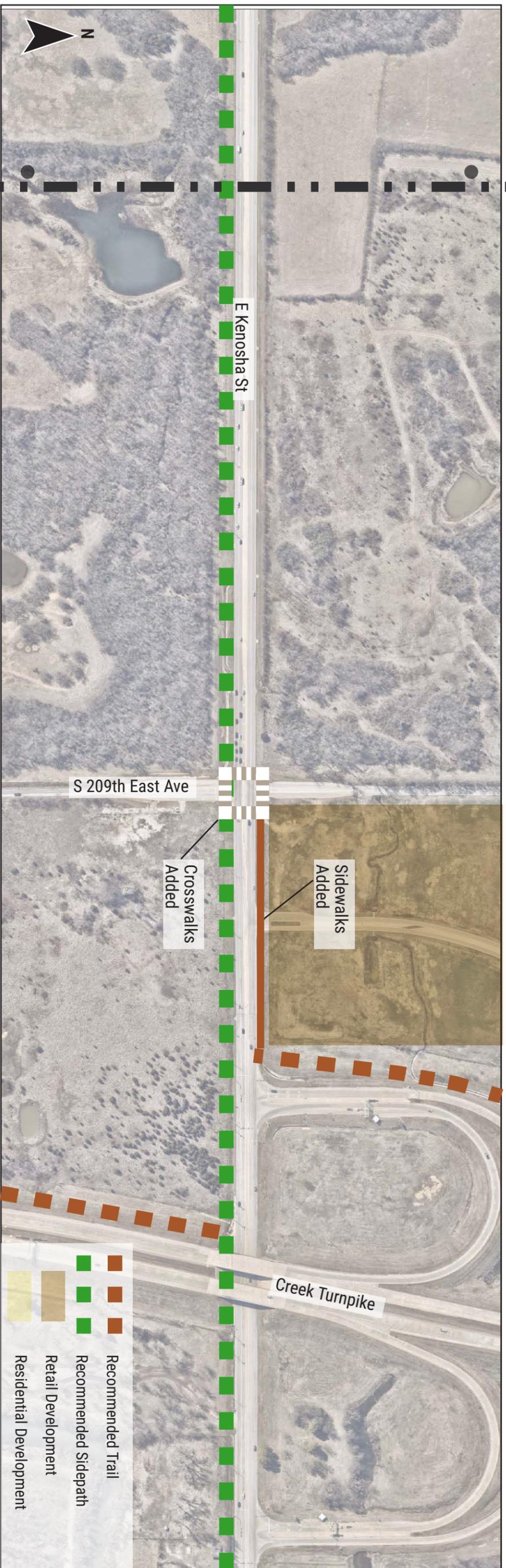
For design specifics on these recommended facilities, see Appendix A: Design Guidelines.



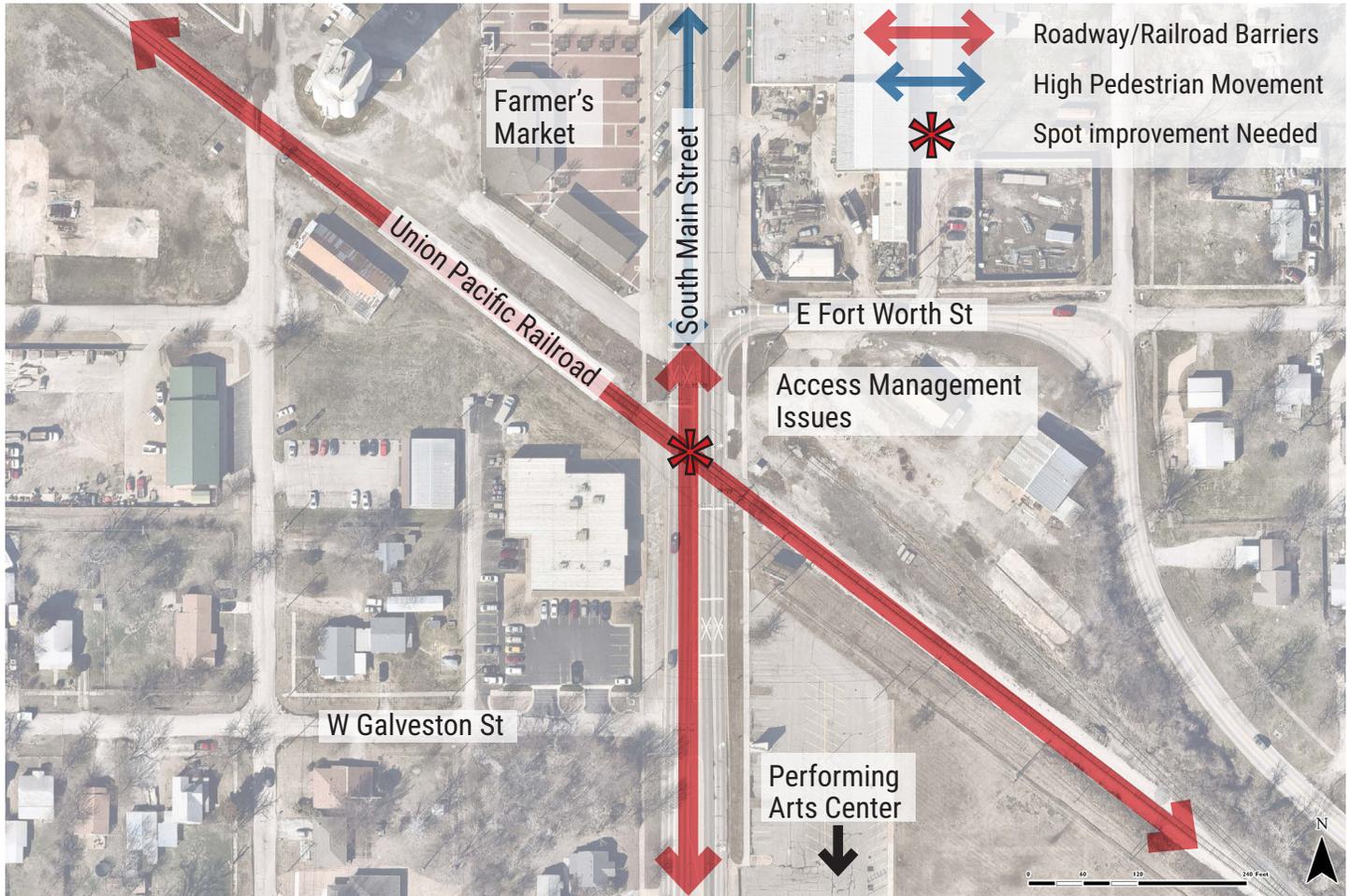
Sidewalk crossing driveway



Trail running parralel to roadway



# INTERSECTION OF MAIN STREET AND THE RAILROAD TRACKS



## Why is this a focus area?

- Main Street functions as the key commercial and transportation corridor through Broken Arrow
- The Union Pacific railroad tracks create an odd angle through town and the parcels and development has had to respond in a similar acute way, which results in odd intersections and driveway access
- Access off of Main Street to the Farmer's Market and to Rose District north of focus area
- Main Street is extremely wide to cross as a pedestrian because of its four travel lanes and then angle parking
- There are no bicycle facilities along Main Street and the roadway narrows with curb extensions and wider sidewalks to the north in the Rose District where sharrows have been implemented



Typical crosswalk on West Main Street



Streetscape improvements at W Dallas Street

## INTERSECTION OF MAIN STREET AND THE RAILROAD TRACKS

### Proposed solutions

- Re-design Main Street as a road dieted street from 4 lanes to 3
- Add bike lanes with the reallocated space from the diet and provide bicycle jughandles to encourage crossing railroad tracks at a 90-degree angle
- Re-configure the head in angle parking to be head out angled parking to provide safer conditions along the new bike lanes and parking
- Add continuous sidewalks along both sides of South Main Street to provide connections to the local schools, the Main Street commercial district, and to neighborhood parks and the recreation center
- Add a crosswalk and HAWK signal on the leg north of E Fort Worth Street.

For design specifics on these recommended facilities, see Appendix A: Design Guidelines.



Bike lane with head-out angled parking



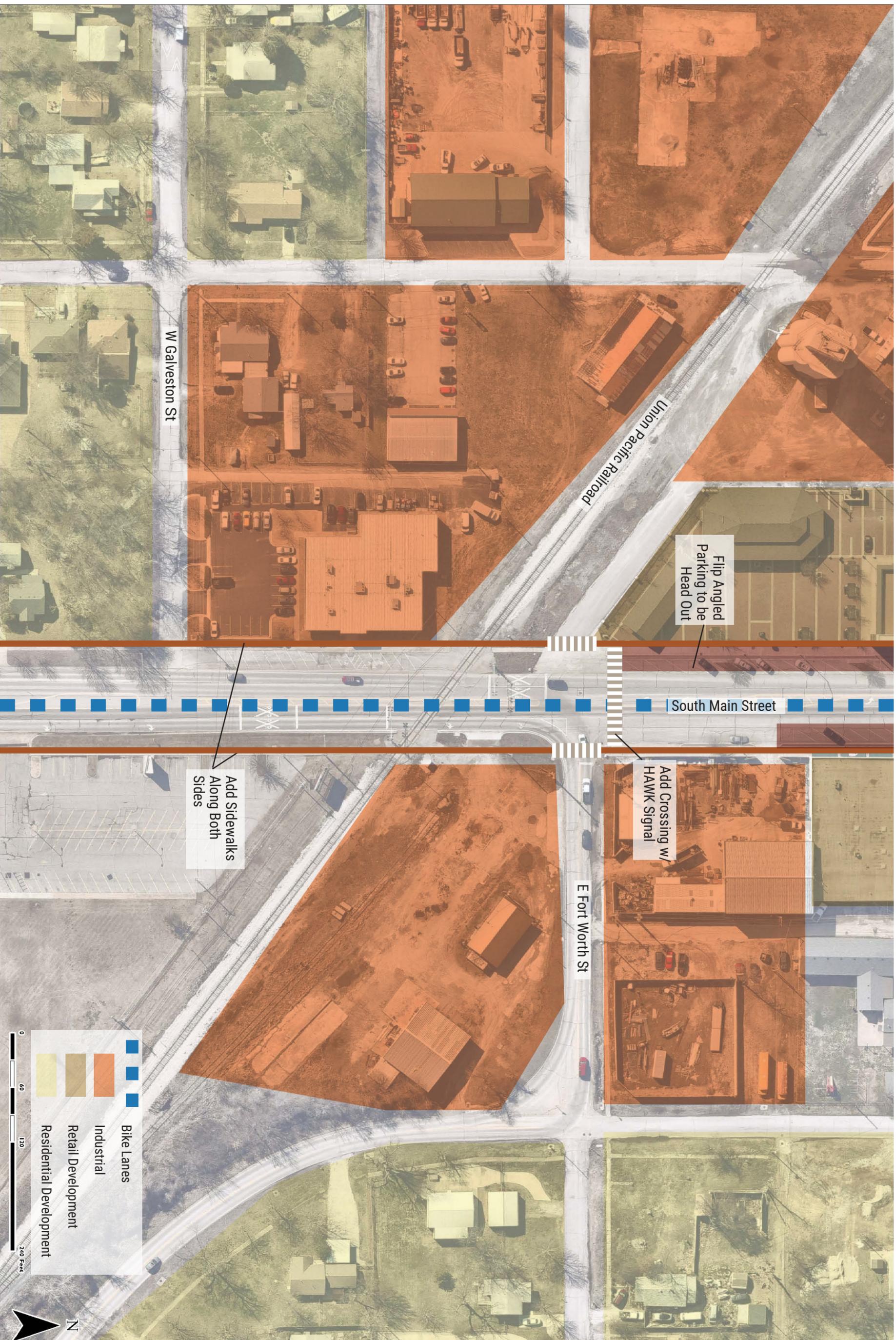
Colorized crosswalk



Head-out angle parking



Retail sidewalk



Flip Angled  
Parking to be  
Head Out

South Main Street

Add Crossing w/  
HAWK Signal

Add Sidewalks  
Along Both  
Sides

W Galveston St

E Fort Worth St

- Bike Lanes
- Industrial
- Retail Development
- Residential Development



## Bicycle Network Recommendations

The bicycle facility recommendations for Broken Arrow were developed through the process described in Chapter 2, including a number of conversations and reviews with City staff in the Planning department. These recommendations connect neighborhoods, commercial centers, schools, parks and other major destinations with a range of facility types appropriate to the given street type. For instance, a signed neighborhood route is recommended on South Lions Avenue to connect the sidepaths on New Orleans Street (E 101st Street S) and Washington Street (E 91st Street S) which are major arterials requiring a separated facility to be comfortable for most bicyclists.

The set of recommendations for Broken Arrow was prioritized according to the process described in Chapter 4 incorporating measurable variables

that define the safety and connectivity of projects, among others. The results of this process are included in Appendix C. The prioritization process is only a tool in determining how a city should go about implementing projects. Other factors such as grant opportunities or development may enable a city to develop the network in an order not consistent with the priorities. The list in the appendix should be used as a guide and not as an implementation schedule. While this prioritization listed represents a quantitative assessment of the projects, the City should also consult this Plan whenever street reconstruction or resurfacing projects occur to capitalize on programmed project investments.

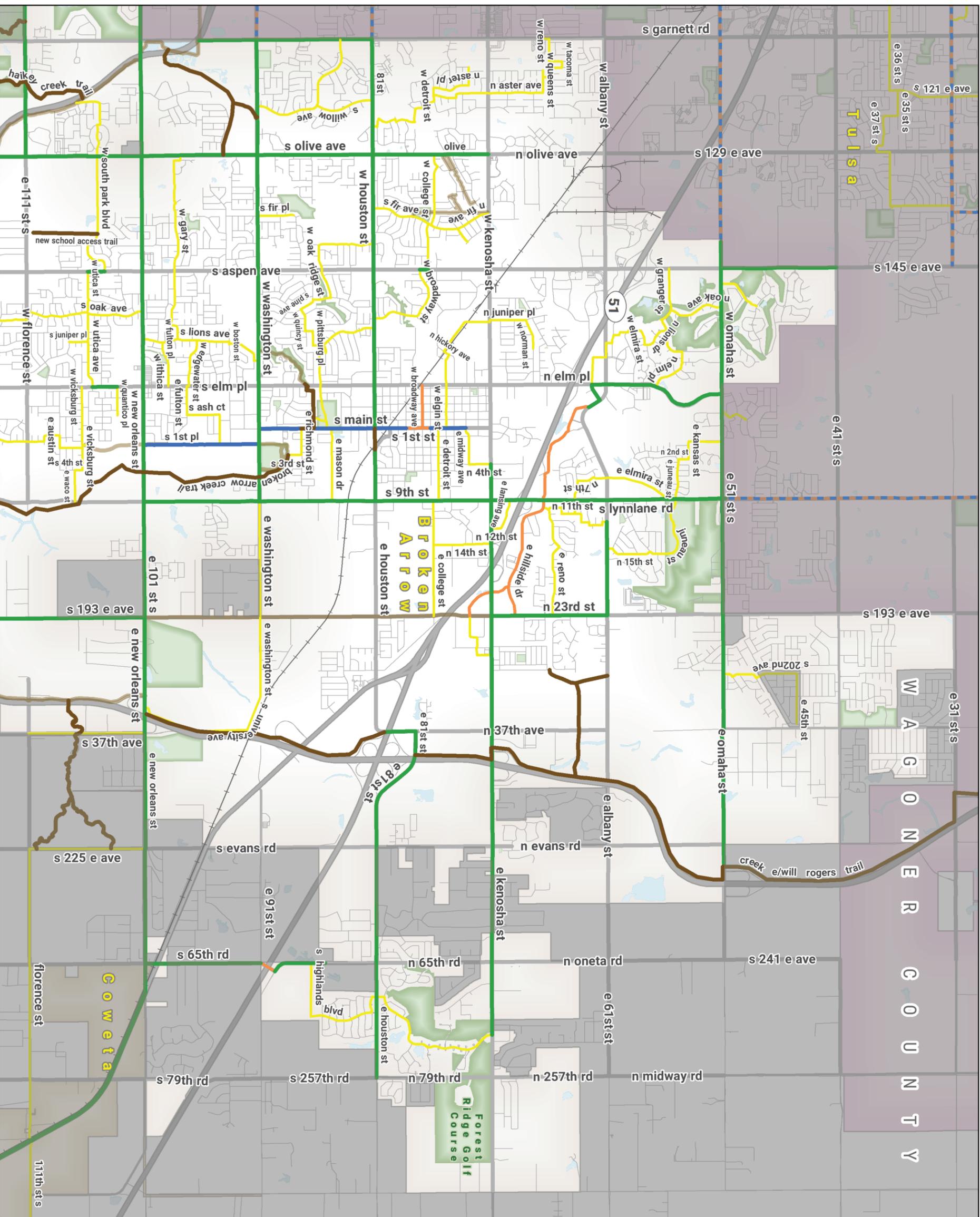
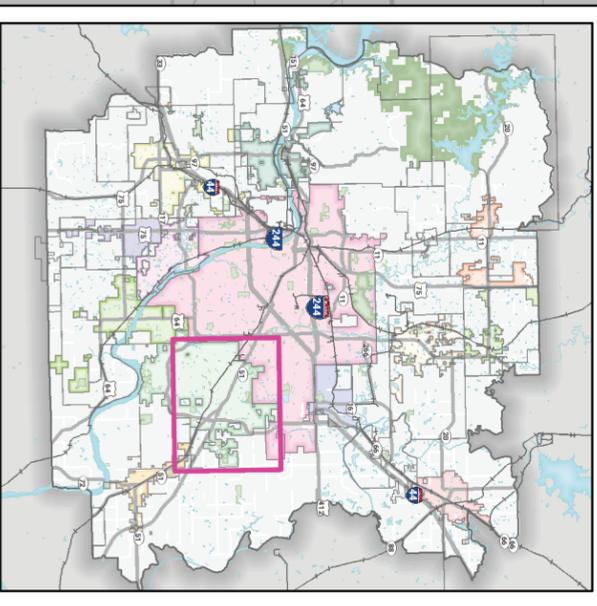
BROKEN ARROW	TOTAL MILEAGE	COST PER MILE	TOTAL COST
Signed Route	54.80	\$ 800 to 18,500	\$942,000
Shared Lane Markings	3.36	\$33,400	\$112,000
Bike Lane	2.57	\$71,600	\$184,000
Sidepath	51.48	\$719,000	\$37,015,000
Trail	24.03	\$888,100	\$21,338,000
<b>Total</b>	<b>136.24</b>		<b>\$59,591,000</b>

# Final Network 8/31/2015

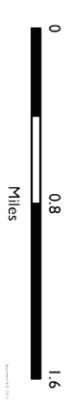
Tulsa Regional Bicycle & Pedestrian Master Plan

## Broken Arrow 1

- | Recommendations     | Existing Facilities |
|---------------------|---------------------|
| Trail               | Trail               |
| Sidepath            |                     |
| Bike Lane           |                     |
| Shared Lane Marking |                     |
| Signed Route        |                     |



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