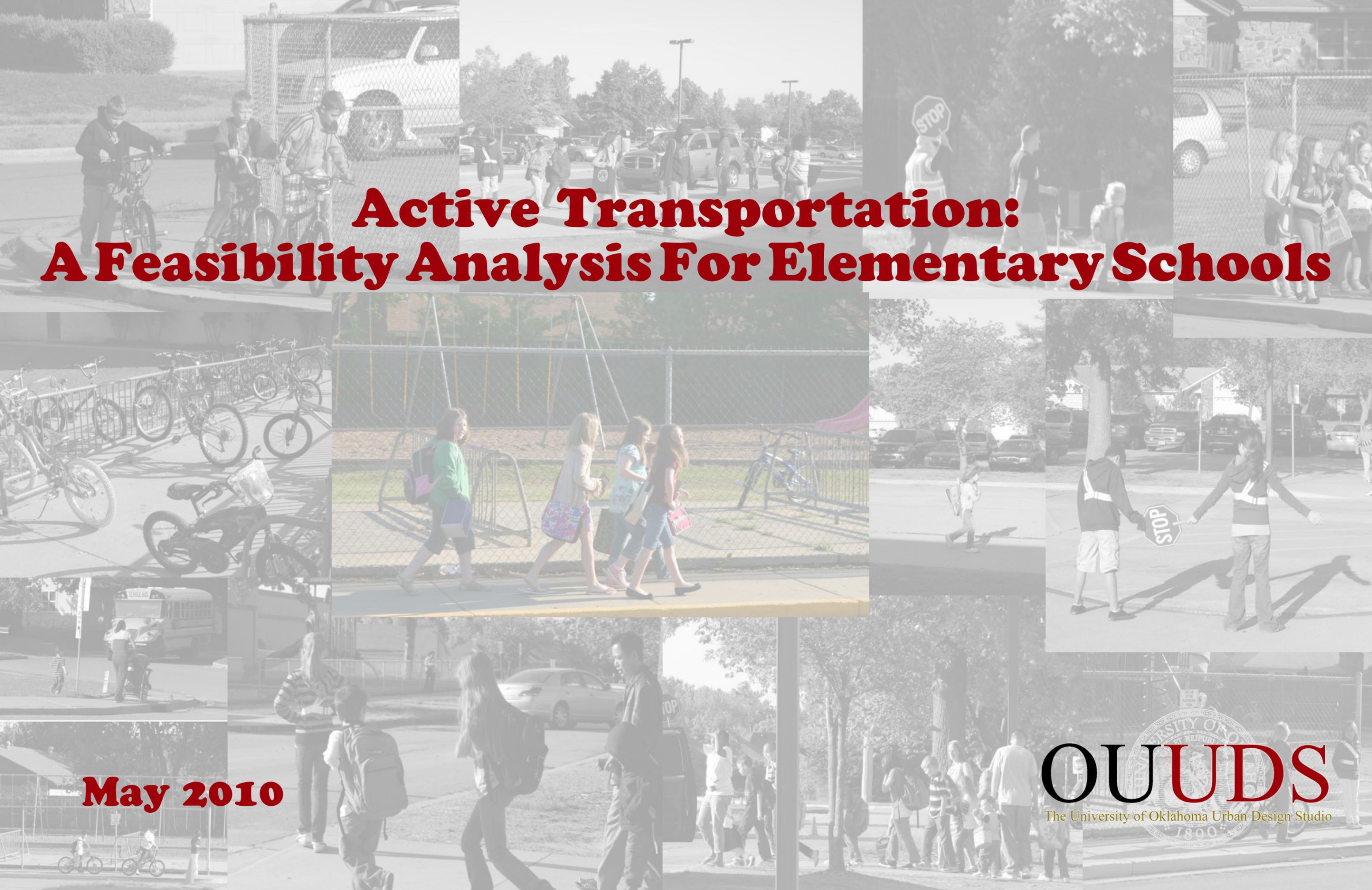


# Active Transportation: A Feasibility Analysis For Elementary Schools



**May 2010**

**OUUDS**  
The University of Oklahoma Urban Design Studio



# Acknowledgements

For all their contributions we would like to express our gratitude to the following:

Jan Creveling, Genie Shannon and Cindy Lamon at TACSI

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Principal Tamara Bird and the students, staff and teachers at Briarglen Elementary

Principal Sherri Fair, Assistant Principal Chris Reynolds, and the students, staff and teachers at Boevers Elementary

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Ren Barger at Tulsa Hub

Kurt Bickle at INCOG

## PROJECT TEAM:

**JESSICA BRENT  
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**Active Transportation:  
A Feasibility Analysis For  
Elementary Schools**

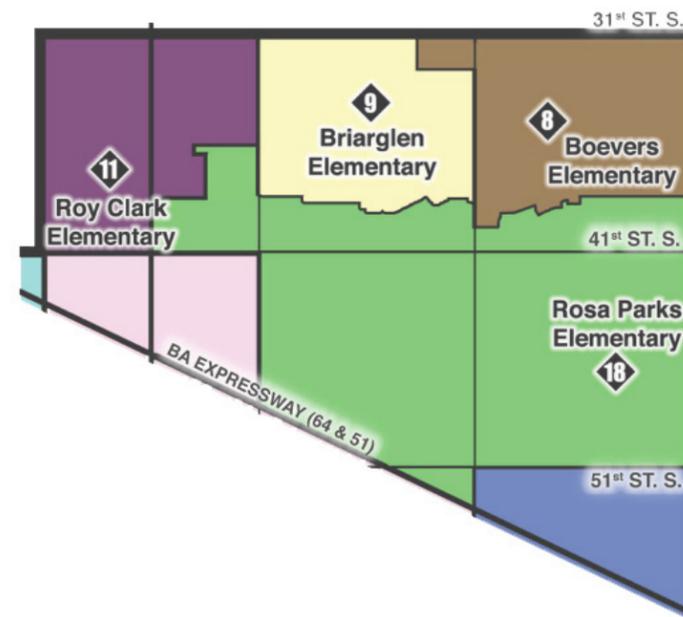


# Introduction

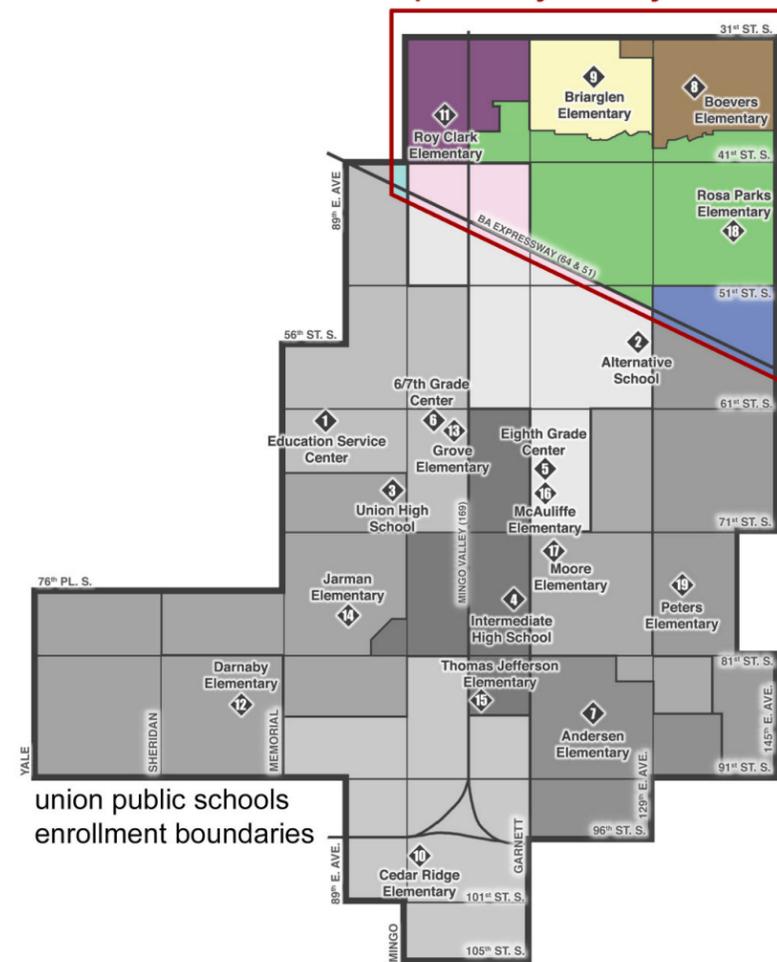
ACTIVE TRANSPORTATION: *human-powered modes of transportation, ie: walking, bicycling, skating etc.*

Over the last few decades the number of children that walk or ride bikes to and from school has declined steadily. This trend coincides with the increase in childhood obesity and poor air quality. Many of the reasons for this decline are directly related to urban design issues that can be mitigated, thereby, increasing safety, enjoyment and viability of active transportation.

Throughout the Fall 2009 semester, four first year Urban Design Studio students sought to create a method of analyzing active transportation barriers using Geographic Information System (GIS) mapping. The studio partnered with the Tulsa Area Schools Initiative (TACSI) and four Union Public Elementary Schools: Boevers, Briarglen, Roy Clark and Rosa Parks. Each of the four students, Laura Mauck, Jessica Brent, Jose Villalva and Marcae' Hilton, selected one school as the focus of their research which included field observations, photographic documentation, student surveys, demographic analysis, and mapping. The data collected, findings and recommendations are included in this report.



primary study area



union public schools enrollment boundaries



# Executive Summary

## INTRODUCTION

In the Fall of 2009 the Urban Design Studio partnered with Tulsa Area Community Schools Initiative (TACSI) and Union Public Schools to conduct a study analyzing the feasibility of active transportation for students in four elementary schools: Briarglen, Boevers, Roy Clark and Rosa Parks. Below is a summary of the project and results of the research.

## METHODOLOGY

- Comprehensive photo survey
- Investigation into condition and availability of current infrastructure
- Demographic analysis of school age population
- Traffic tallied to and from school
- GIS mapping, examining existing city and school bus transportation routes and observing current pedestrian systems

## GENERAL FINDINGS

- The study area has a significantly lower median age than Tulsa County or the surrounding areas of the city.
- The study area has a diverse population and there is evidence from increasing school enrollments that population density is increasing as immigrant families begin to share housing units.
- Physical and social disconnects exist between apartment complexes and neighboring developments.
- High speed traffic along arterial streets (which operate well under capacity) pose hazards to pedestrians.
- Most residential streets in the study area have sidewalks while sidewalks have not been provided by the City of Tulsa along arterial streets in many areas. Footpaths are apparent in the unimproved shoulders of these areas.
- Lines of standing vehicles exist at all schools during dismissal and present a hazard to students on foot or bicycle.
- Social barriers also hinder active transportation. For example, parental fears often prevent children from walking or biking to school.



# Executive Summary

## FINDINGS AT SCHOOLS

### BOEVERS: GOOD CANDIDATE FOR ACTIVE TRANSPORTATION

- Boevers students are relatively evenly distributed over their enrollment area but with more density in the apartment complexes.
- Some students are within a half mile walking distance of the school, even if the routes taken are indirect, but there are also many that would have considerably farther to walk.
- While the enrollment area is small, a bus is currently needed to service the isolated populations.
- The most notable barriers are the creek and the fences.

Recommendations: Boevers students would benefit from a community effort to have paths put in place for them in certain areas, like along some of the utility easements. These could provide a way to cut down on the walking distance in some areas. This would be especially helpful for the Sawmill Apartments residents, although for this to work there would also need to be a gate strategically placed within their fence. In the northeast quadrant of the school district, streets offer especially poor connectivity but students there would be helped a little by having a path put in from their community, along the utility easement, to the southeast corner of the school. Students from the eastern part of the enrollment area could ride bicycles to and from school.

### BRIARGLEN: EXCELLENT CANDIDATE

- Briarglen students are evenly distributed throughout the small enrollment area.
- Nearly all students are within a half mile walking distance of the school, even if the routes taken are indirect.
- While the enrollment area is small, a bus is needed to service two isolated populations.
- The most notable barriers are fence lines and the creek bisecting the neighborhood.
- The development to the Northwest is isolated primarily by fence line.
- The E 35th St cul-de-sac is isolated by the creek which separates it from the opposing cul-de-sac.



# Executive Summary

*Recommendations:* The northwest enclave of apartments could easily be connected to the neighborhood street grid by eliminating fence line barriers. The Garnett Church of Christ is situated between the enclave and the school. Residents may be able to obtain an easement from the church for pedestrians to cross safely through the southern portion of their property. Fence lines extend across dead-end streets on either side of the church and could be opened or converted to gates to accommodate pedestrians without affecting residents' private property. The E 35th St enclave could be connected to the opposing cul-de-sac with a small bridge. Footpaths through this barrier indicate a need to safely accommodate pedestrians wishing to cross.

## ROY CLARK: GOOD CANDIDATE FOR ACTIVE TRANSPORTATION

- The Roy Clark enrollment area has two large concentrations of students. The area with the most density is the apartment complex on the corner of 31st and Mingo.
- The Roy Clark enrollment area has two significant barriers: Mingo Creek and US Highway 169.
- The school is isolated from almost all residential areas by barriers and is accessible only from the north and south by one road.
- There is a 190' long pedestrian tunnel connecting the school to residential areas to the east of Highway 169

*Recommendations:* US Highway 169 is immediately east of the school. The pedestrian tunnel connecting the school side to residential areas to the east, does not appear to be maintained by the Oklahoma Department of Transportation. The tunnel was observed to have standing water on the east end due to poor grading and drainage. No lighting has been provided even though electrical conduit exists for this purpose. If this tunnel was maintained and utilized as many as four school bus routes could be eliminated. A crossing guard or parent volunteer is needed at the tunnel before and after school for security.

The engineered channel of Mingo Creek runs on the west side of the school cutting off another residential area. A 230' bridge with approach paths would be needed to connect the two sides which could eliminate one bus route. This option would be too expensive.

An apartment complex in the far Northwest corner of the enrollment area is fenced in and cut-off from the residential street system leading to the school, compelling parents to drive students. An opening in the fence and an access easement by an adjacent apartment complex is needed to allow students a walking route. Adding sidewalks to this area, would increase the walkability.



# Executive Summary

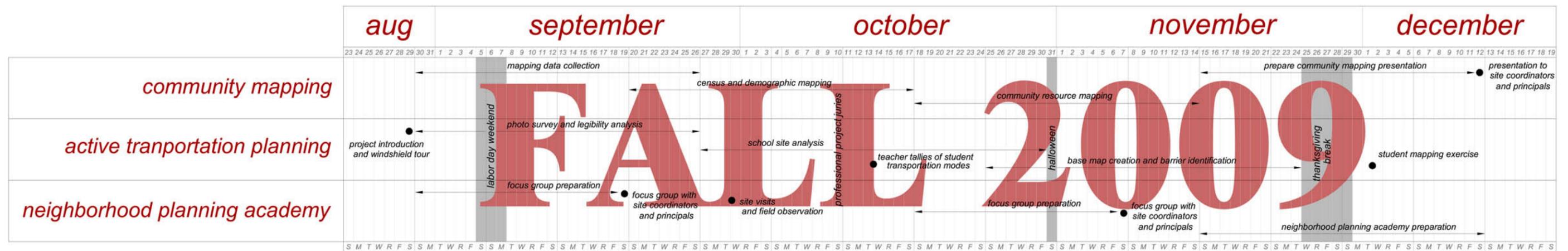
## ROSA PARKS: POOR CANDIDATE

- Rosa Parks students are densely populated in the corners of several major intersections, these intersections primarily consist of multi-family housing.
- Essentially no students are within a half mile walking distance of the school.
- Because the enrollment area is sprawling, buses will be needed to service the majority of the population for the foreseeable future.
- The most notable barriers are arterial streets, with five lanes, bisecting the neighborhoods.

*Recommendations:* Rosa Parks is not recommended as a good candidate for active transportation. However, Union Public Schools in conjunction with the City of Tulsa are in a position to make Rosa Parks an example of improved planning, connectivity, and community pride, through considering the needs of the community and in the future development of the area surrounding the school.



# project schedule



# Goals and Objectives

The primary objective of this study was to develop a method of determining which schools are good candidates for active transportation by identifying barriers that can be mitigated. Partnering with schools and educating them about active transportation programs and opportunities, is an important element. Our hope is that this study can be of use on many levels.

- Children may reap the health benefits of exercise. Active transportation may also foster independence and confidence in navigating their environments.
- Parents may save time and money.
- School districts have the opportunity to save money by eliminating bus routes.
- Social capital may be increased. As people leave their cars and houses there is the opportunity for valuable interaction between neighbors, which can potentially create safer neighborhoods.

As a long range goal, mapping and analysis may lead to the planning of future school sites to ensure active transportation can be utilized by students and obstructive urban design is not repeated.



# Methodology

A. A photographic survey was done of the area. Photos were classified in a matrix by school area and 14 subject categories organized as buildings, streets and open space.

B. Multiple observational visits were made to each school to witness arrival and dismissal procedures. Automobiles and buses were counted with hand counters.

C. Overall mapping of the area was accomplished using Geographic Information System technology and data from the 2000 United States Census, Indian Nations Council Of Governments (INCOG), Federal Emergency Management Agency (FEMA), and United States Geographic Survey (USGS).

Maps were created in four categories: Demographics, Physical Features, Land Use and Transportation. In addition, field surveys were done and diverse community uses mapped according to Leadership in Energy and Environmental Design Neighborhood Development (LEED ND) definitions. Sidewalks were mapped by tracing aerial photographs.



D. A Safe Routes to School (SRTS) Analysis procedure was developed using mapping and observational data:

1. A base map was created using aerial photographs, floodplains, zoning, and census data for school age children.
2. One-quarter mile and one-half mile radius buffers were added to the map and service areas calculated for  $\frac{1}{4}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  mile distances to determine viability for walking.
3. Barriers were identified as watercourses, arterial streets, fences, utility easements and miscellaneous barriers.
4. Isolated enclaves and concentrated student populations were identified.
5. A hierarchy of streets and sidewalks leading to and from the school was considered for safe route designation. Dangerous intersections or crossings were identified and missing infrastructure flagged.

E. Tallies of students were attempted at the schools to measure the number of children arriving or leaving the school by different modes. Data was collected by the teachers by count of hands in their classes on three different days. Adoption by the different schools varied from almost complete compliance by the teachers to no data being returned.

# Photo Survey and Analysis

One of our initial steps in the process of learning about our study area was to go out and take pictures of the area containing the four most northern Union elementary schools: Briarglen, Boevers, Roy Clark, and Rosa Parks. We divided the area by school boundaries and each of students focused on finding key aspects of one of the neighborhoods.

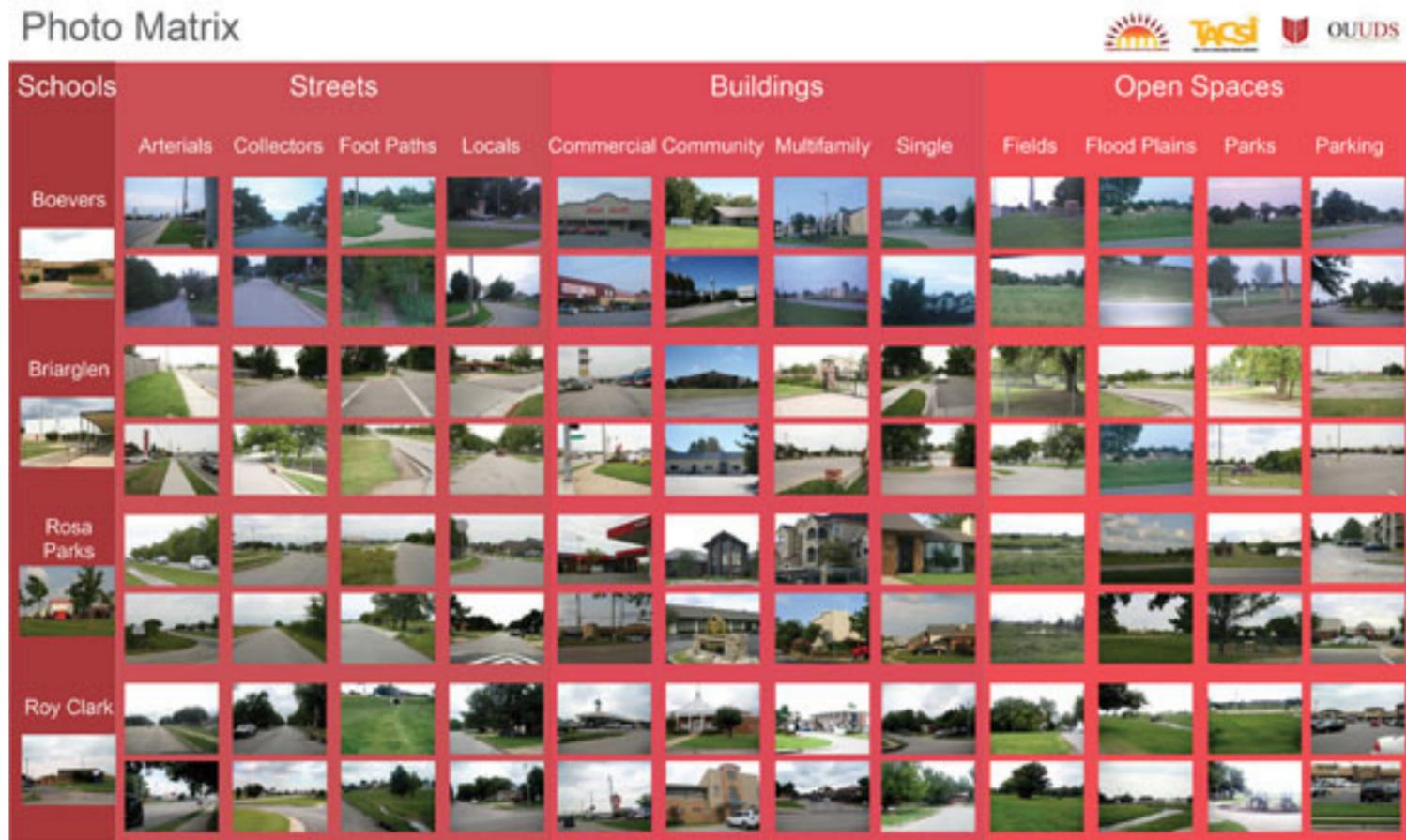
While initially we wanted to become familiar with the study area, we quickly decided to turn our attention to key features of the neighborhoods that were pertinent to assessing these areas for active transportation possibilities and shortcomings.

To organize our pictures we created categories that pertained to the more important issues at hand: streets, buildings and open spaces. Within the category of streets we designated sub-categories of arterials, collectors, footpaths, and residential. Within the building category we ascertained the need for sub-categories of commercial buildings, community use buildings, multifamily, and single family dwellings. Among the types of open spaces were fields, floodplains, parks, and parking.

The impressions of the area from our observations included an extensive network of sidewalks along most, but not all, collector and neighborhood streets. From observations these may be underused. At the same time we found the majority of arterial streets in the area to be without sidewalks. This appeared to be an issue that should be addressed because in these areas there were a lot of paths worn by pedestrians in the grass along the arterial streets. We also observed numerous bicycle riders trying to navigate their way along the paths in the grass.

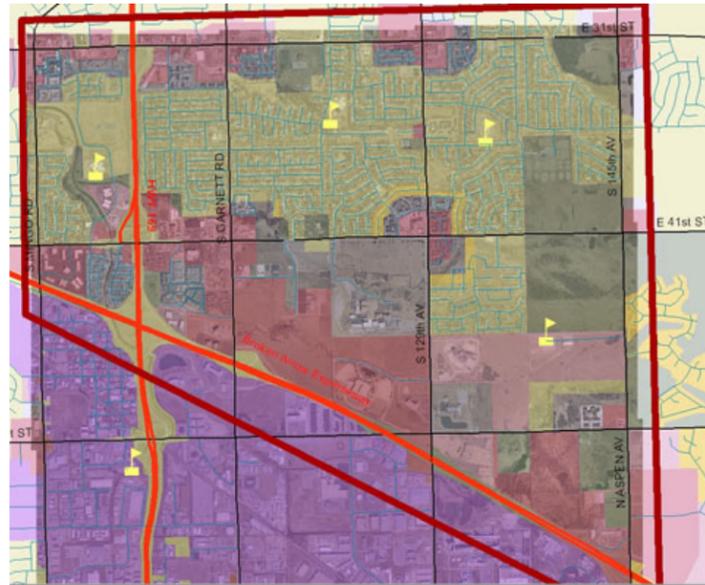
Buildings in the area include some excellent community service buildings, numerous apartment communities, and various types of housing from duplexes, to single family. A number of shopping areas were located at the crossing points of the arterial streets with some additional ones along the arterials. There are also some corporate campuses that take up large areas of land in the southern region of our study area.

Extensive amounts of open space and undeveloped land are found in some parts of the area, which add to the challenges of serving school districts with Safe Routes to Schools. Some of the areas are unbuildable due to flood considerations, but are being used for recreational purposes. Some parts of these have actually been made into parks. Other areas are used for parking. In many of the apartment complexes and a few other areas, upkeep of the paving was much needed.

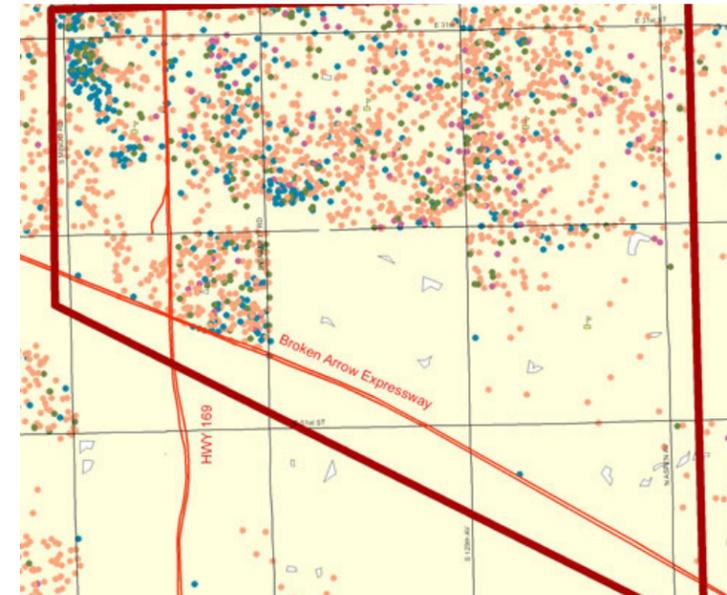


# Study Area Mapping Analysis

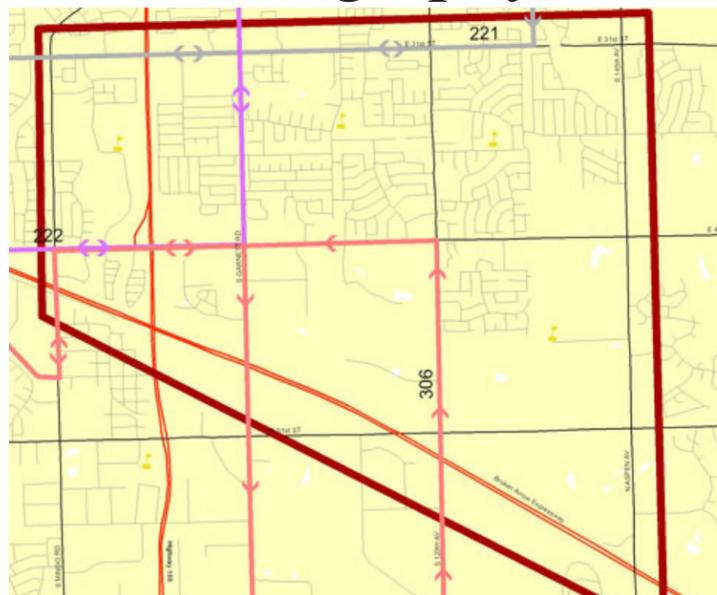
### Land Use



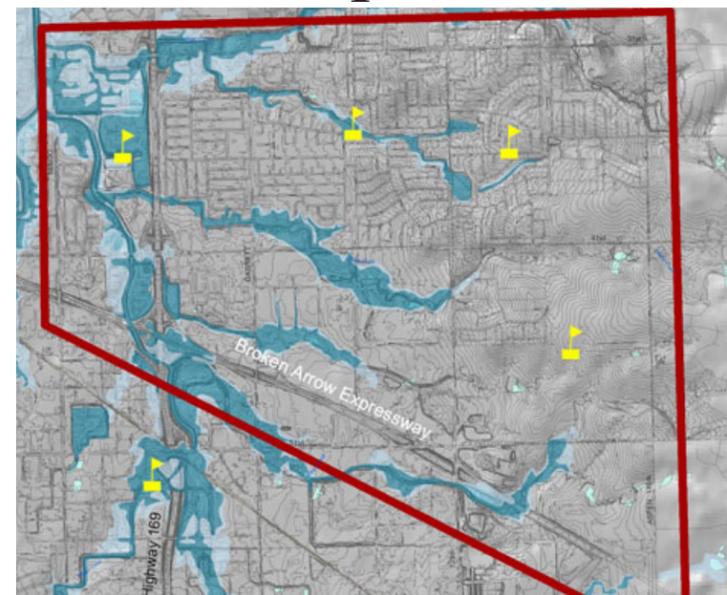
### Demographics



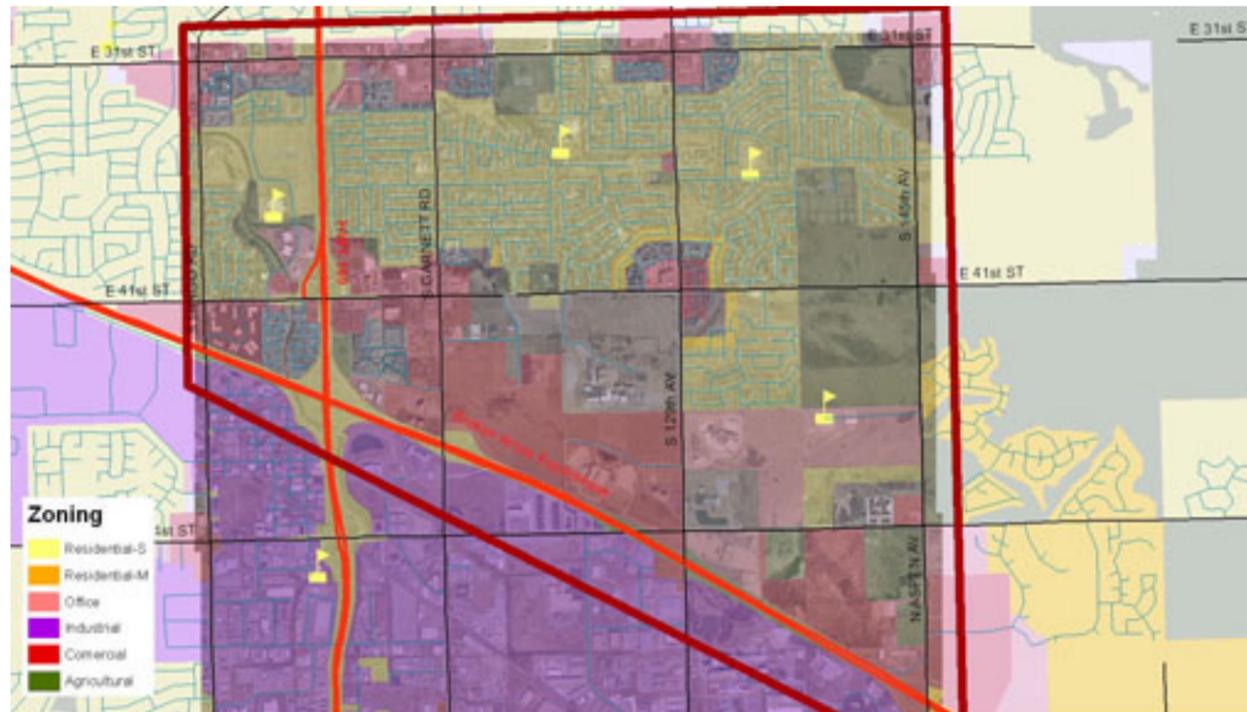
### Geography



### Transportation



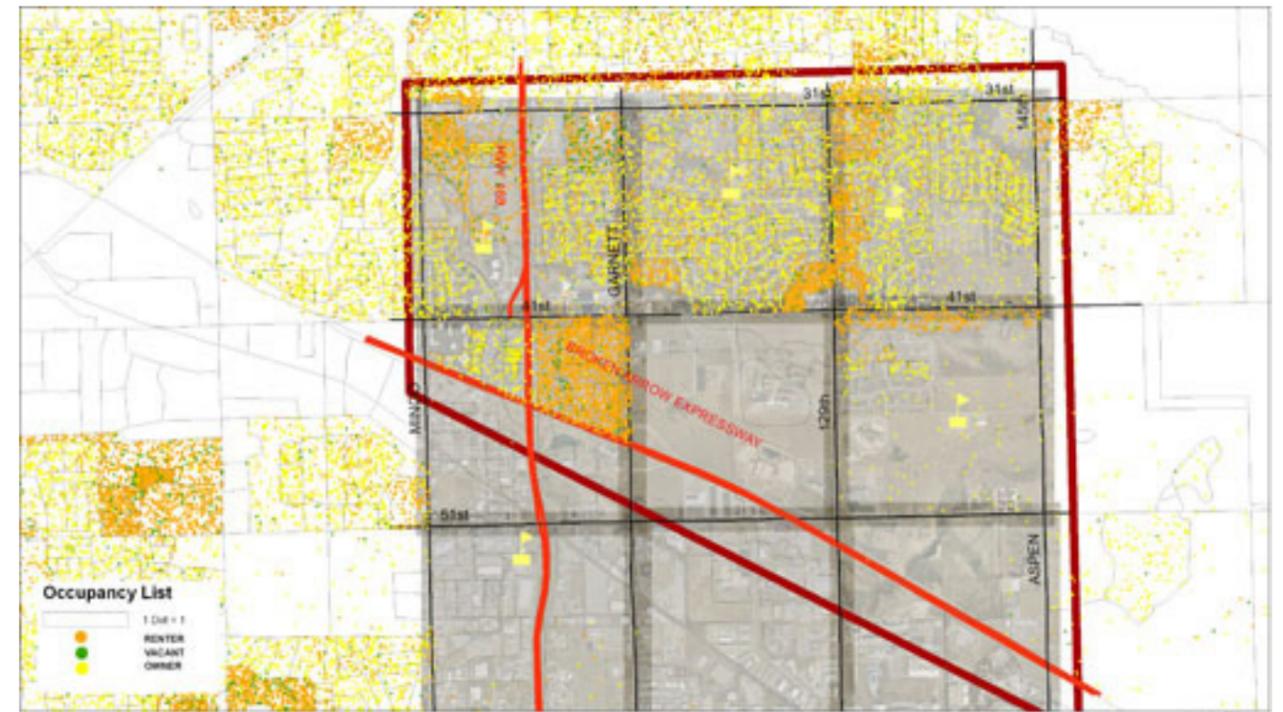
## Land Use



### Zoning

This Map shows the zoning found within the study area. The study area was initially developed in the 1970's and adheres to the Land Use Intensification System (LUIS) planning concept used in East and South Tulsa. In this system, commercial high-intensity uses occur at intersections of arterials streets. Multi-family housing is used as a transitional use between the commercial and the single-family residential subdivisions filling the majority of the land. This development pattern creates low densities, segregated uses and automobile dependence.

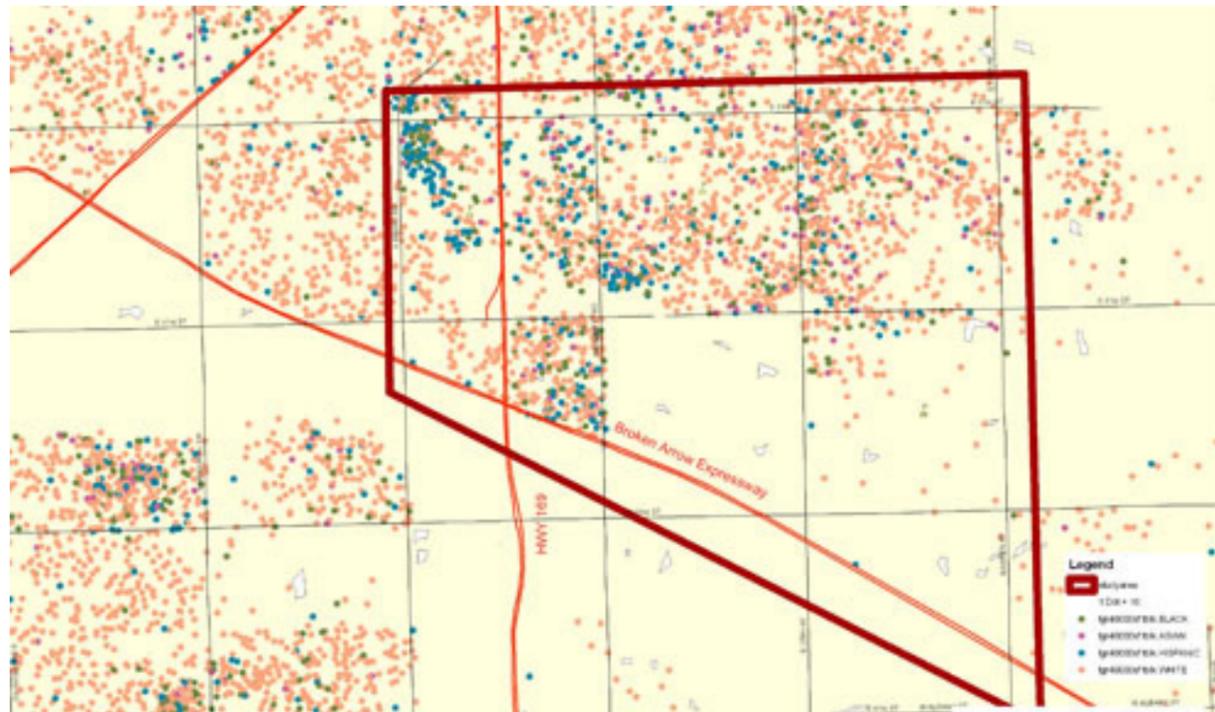
Even though the study area's uses are segregated, it does not lack for goods and services and contains a wide range of diverse uses which could be accessed on foot if better and safer connections existed.



### Occupancy List

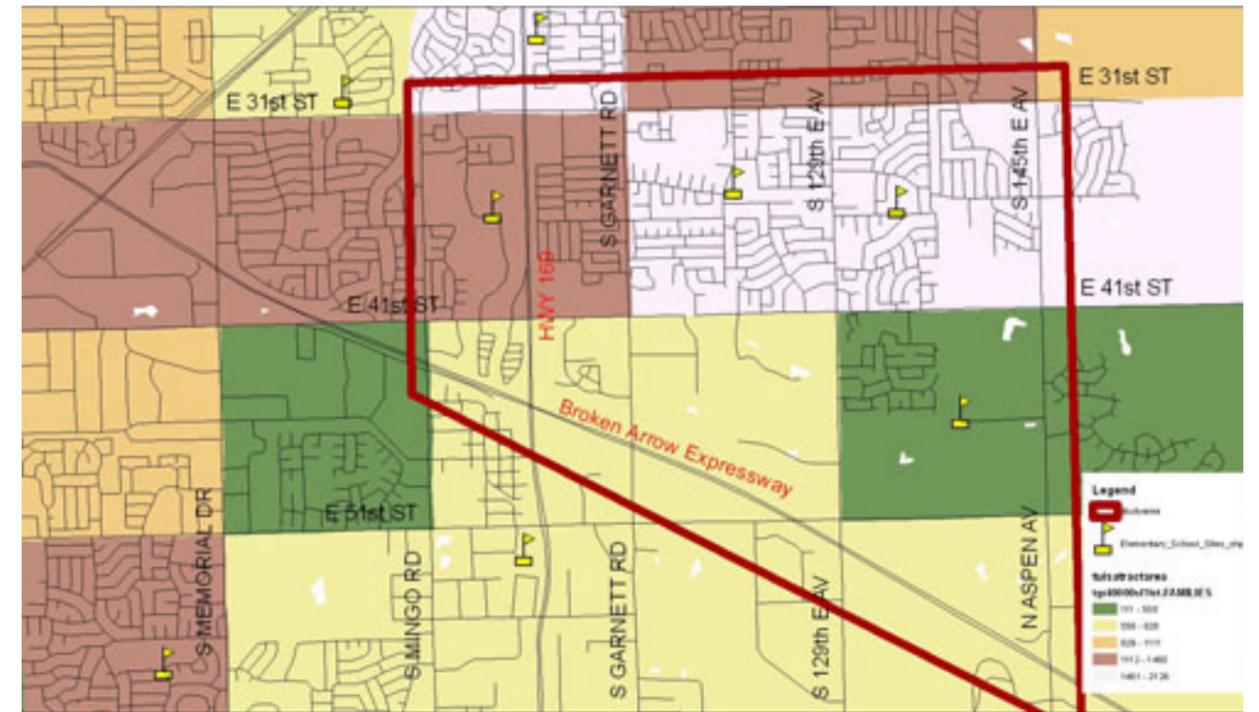
This map illustrates the housing occupancy found within the study area. This area of East Tulsa has a similar break down of renter-occupied and owners-occupied as Tulsa County, 38% renters and 62% owners. The information used is from the 2000 census. While researching this area it was discovered that the rental properties have a high turn-over rate. This information is valuable to the schools because of enrollment turnover. A child that lives in one enrollment area may move to a different one in a few months.

## Demographics



### Ethnic Diversity

This map reflects data taken from the 2000 Census per block area. Our focus was particularly within our study area boundary from Mingo on the West border to 145th E Ave. on the East. The north boundary is E 31st St to the Broken Arrow Expressway diagonally on the southern border. There were four ethnicities identified by colored dots. Green represents Black or African American. Pink represents the Asian community. Blue represents the Hispanic population. And orange represents the white population. Each colored dot denotes 10 individuals on the map. Hispanic: Heavy Concentrations SE Corner of 31st and Mingo, SW & NE Corner of 41st and Garnett, NW & NE Corner of 41st and 129th E Ave. Light concentrations are found throughout all the study area.

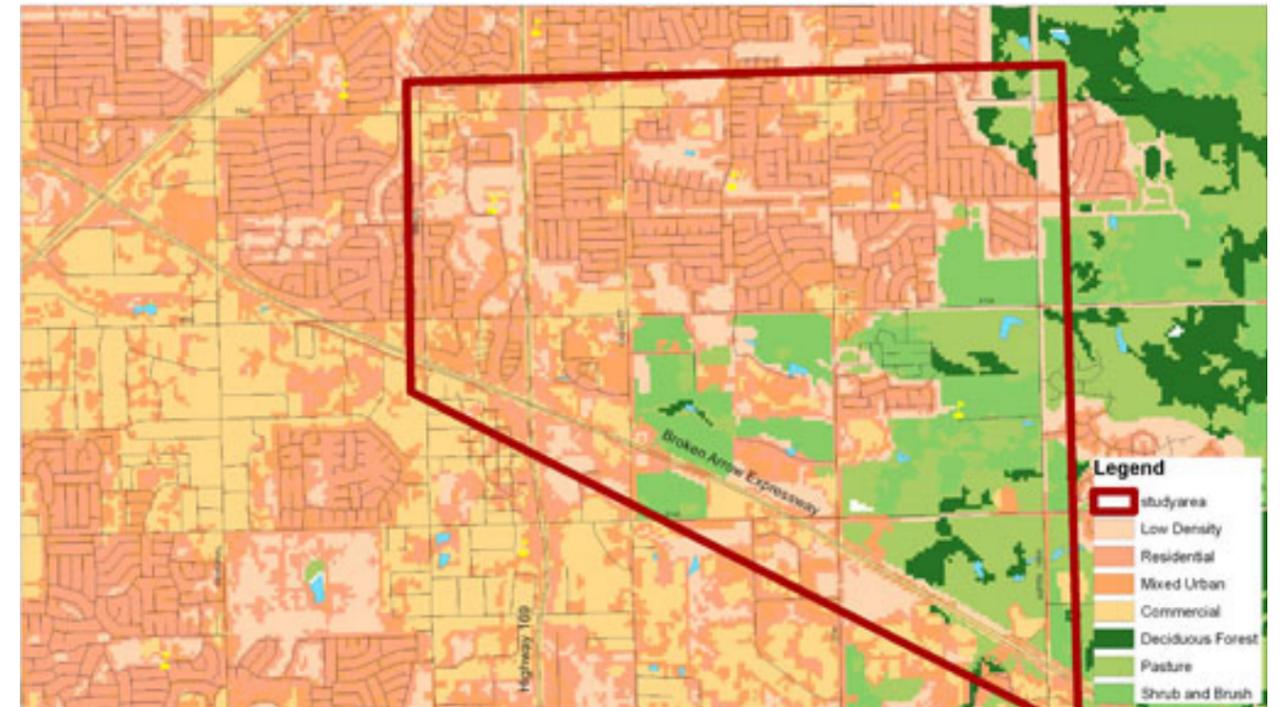
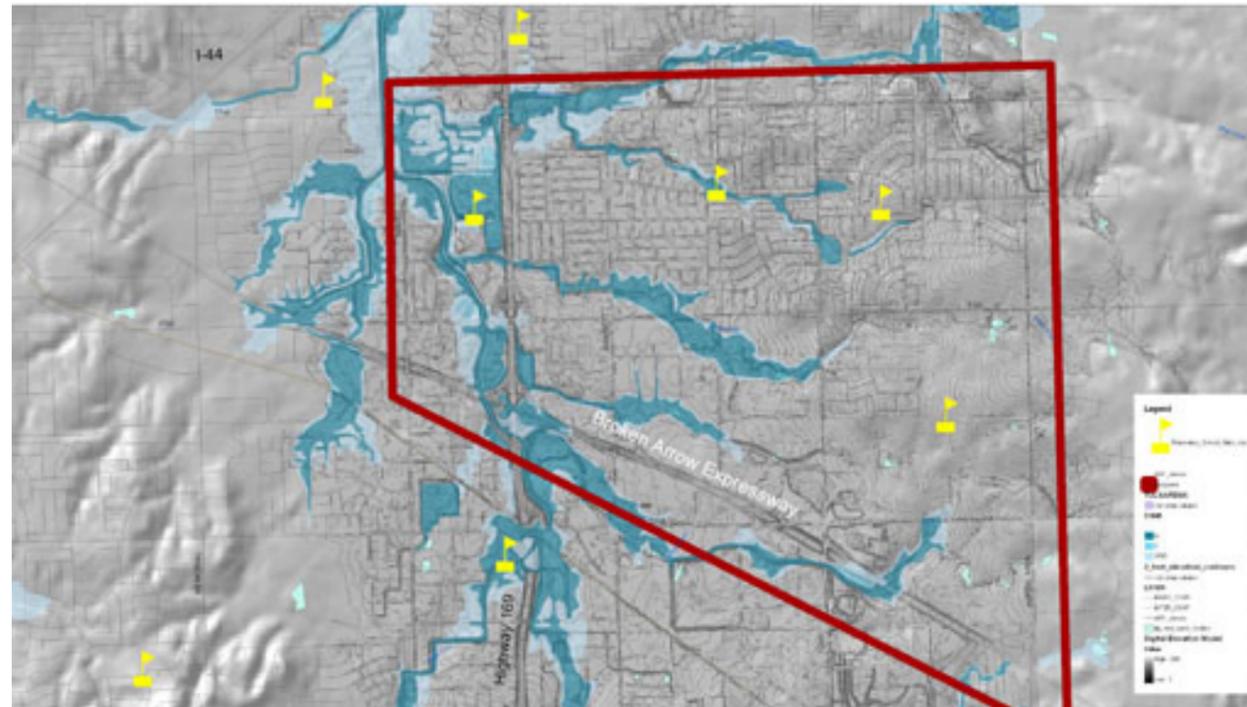


### Family Population

The census tract area covers one square mile. The two areas most concentrated are from the northern boundary of 31st to southern boundary of 41st, between 129th E Ave to 145th E Ave. represented by light pink. The 2000 Census reveals 1461-2126 families within this area which covers two square miles. The second most populated area is one square mile from 31st to 41st and Mingo Rd. to Garnett Rd, with a population of 1112-1460 families is represented by light brown. There are no areas with the middle population of 829-1111 families within our study area. There are two tract areas with a population of 559-1111 families represented by the dark green color. We will see some changes as the 2010 Census data is reported



## Geography



## Topography and Floodplains

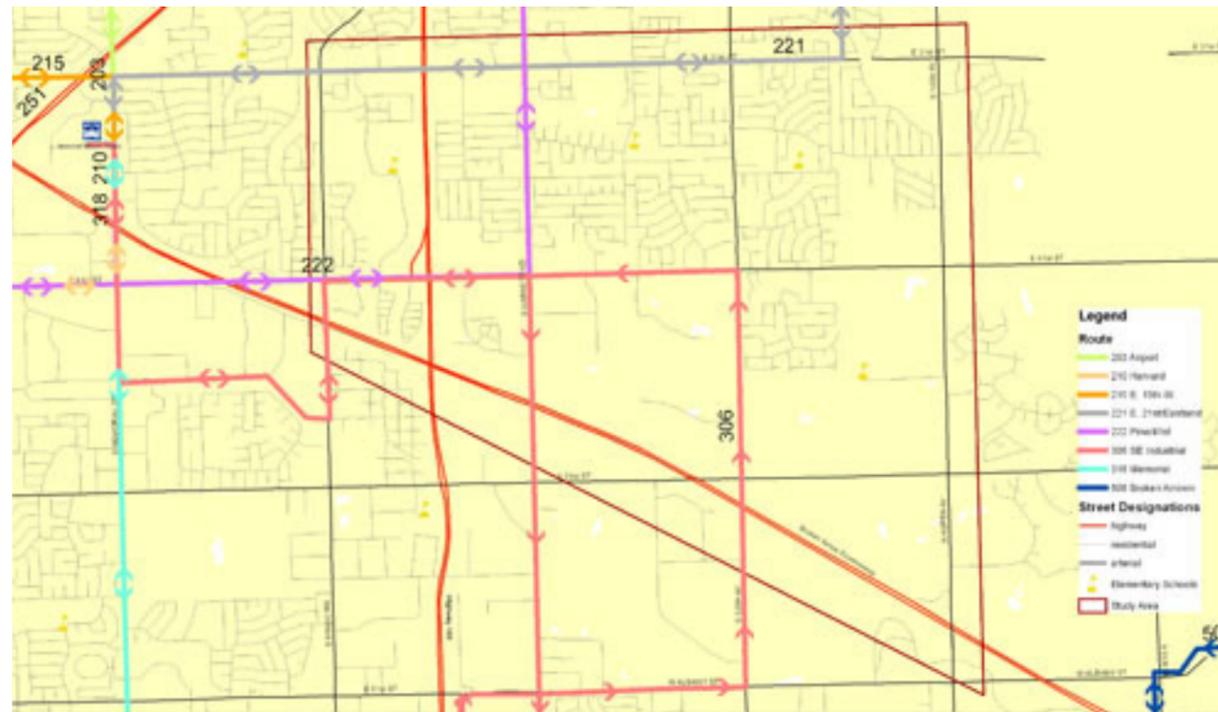
This map looks at the topography which enables one to see how floodplains are an important consideration in our study area, as they become barriers to active transportation in many of the schools' enrollment areas. Two of the elementary schools are surrounded by flood plains. The use of water retention areas as fields for soccer and other sports, near Roy Clark Elementary, makes good use of open grass areas that isolate the school from its students. Some paths and sections of streets in the area are prone to flooding, which is a concern for safety reasons.

## Vegetation

This map shows that there is a lot of remaining native vegetation in the Southeastern section of our study area while the northern and western parts have been more fully developed. There are also large areas of vegetation that remain on some of the developed land because several companies have large office facilities that have been heavily landscaped or retain grassy areas with ponds and trees. Attractive more healthy approaches have been used, limiting extensive parking lots. Much natural beauty remains in these areas, perhaps due to the availability and cost of the land here, when offices were first built.



## Transportation



### Bus Routes

This map depicts public transit routes serving the study area. Note the major station transfer near the study area. However, we see that buses run only along arterials and bus travel potentially requires multiple bus changes. The city bus routes do not adequately serve the elementary schools in the area, least of all Rosa Parks which is the most isolated school.



### Trails

The Mingo Trail is the only existing trail, it is a multi-use trail running along the west side of Mingo Creek. The planned bikeway has the potential to provide good connectivity for Roy Clark, Briarglen and Boevers Elementary schools.



# General Findings

The study area has a diverse population with substantial minority populations including Hispanics, African-Americans, and Asians. There is evidence from increasing school enrollments that population density is increasing as immigrant families begin to share housing units. The study area has a significantly lower median age than Tulsa County or the surrounding areas of the city.

Though the study area's land uses are segregated, it does not lack for goods and services and contains a wide range of diverse uses which could be accessed on foot if better and safer connections existed. Most residential streets in the study area have sidewalks. Over 80 miles of sidewalks with an estimated capital investment of 20 million dollars exist in the study area. These sidewalks are lightly used. Sidewalks along arterial streets in the study area have not been provided by the City of Tulsa in many areas. Footpaths are apparent in the unimproved shoulders of these areas. Pedestrians and even cyclists were frequently observed using these paths. Sidewalks should be built along these high-volume streets.



The schools have plans for handling automobile traffic during arrival and dismissal. Some schools have teachers and staff that act as footmen loading and unloading children from vehicles. To encourage active transportation, schools might consider implementing a policy to only accept or deliver children to adults in person and not idling vehicles.

Warning signs and crosswalks are minimal in the school areas. Lines of standing vehicles exist at all schools during dismissal and present a hazard to students on foot or bicycle. Standing vehicles create the perception of congestion, but traffic flow was minimally impacted and dismissal was usually over in less than twenty minutes.

Mapping analysis reveals physical barriers to active transportation. However, there are equally powerful social barriers that prevent children from walking and cycling to school. Parental fears may include:

- Fear of abduction or molestation.
- Fear of juvenile violence, gang activity or bullying.
- Fear of traffic hazards and dangerous drivers.
- Fear of stray dogs.
- Fear of inclement weather and exposure.

Cursory review of crime data available from the Tulsa Police Department did not reveal any concentrated areas of crime or a higher incidence of crime than other areas of the city.

# Boevers Overview



## Information

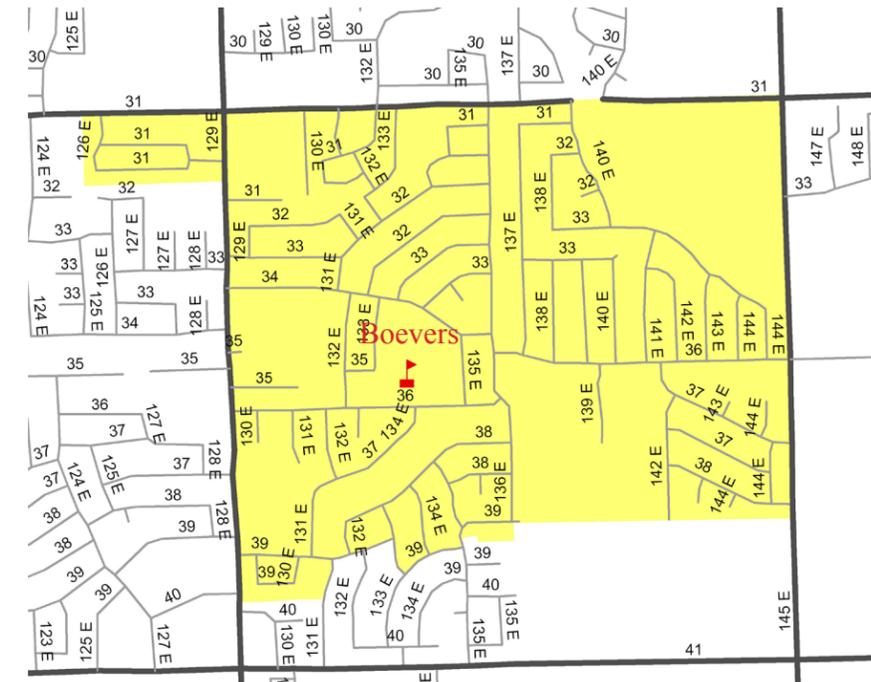
In the 1975-76 school year, George F. Boevers Elementary opened and was named after a 35-year veteran of the district who taught agriculture and was advisor to several school organizations.

George F. Boevers Elementary School  
 3433 S. 133rd E. Ave.  
 Tulsa, Oklahoma 74134-4041

Office Hours: 7:30 a.m. - 4:30 p.m.  
 School Hours: 8:55 a.m. - 3:25 p.m.  
 Main Phone: (918) 357-4329  
 Fax: (918) 357-8399

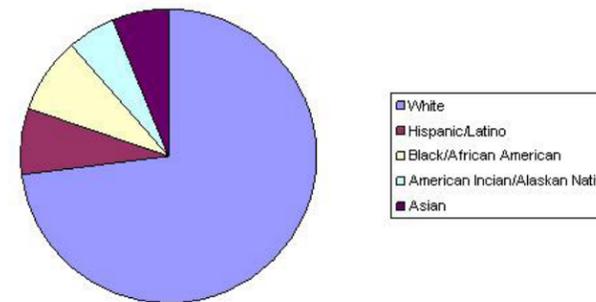
Principal Sherri Fair  
 Assistant Principal Chris Reynolds

Enrollment Area 2010

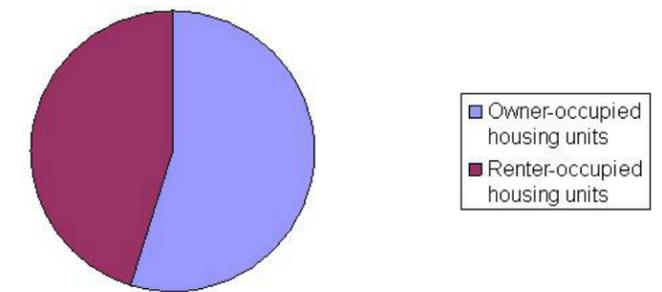


## Census

Ethnicity within Boevers Elementary Enrollment Area

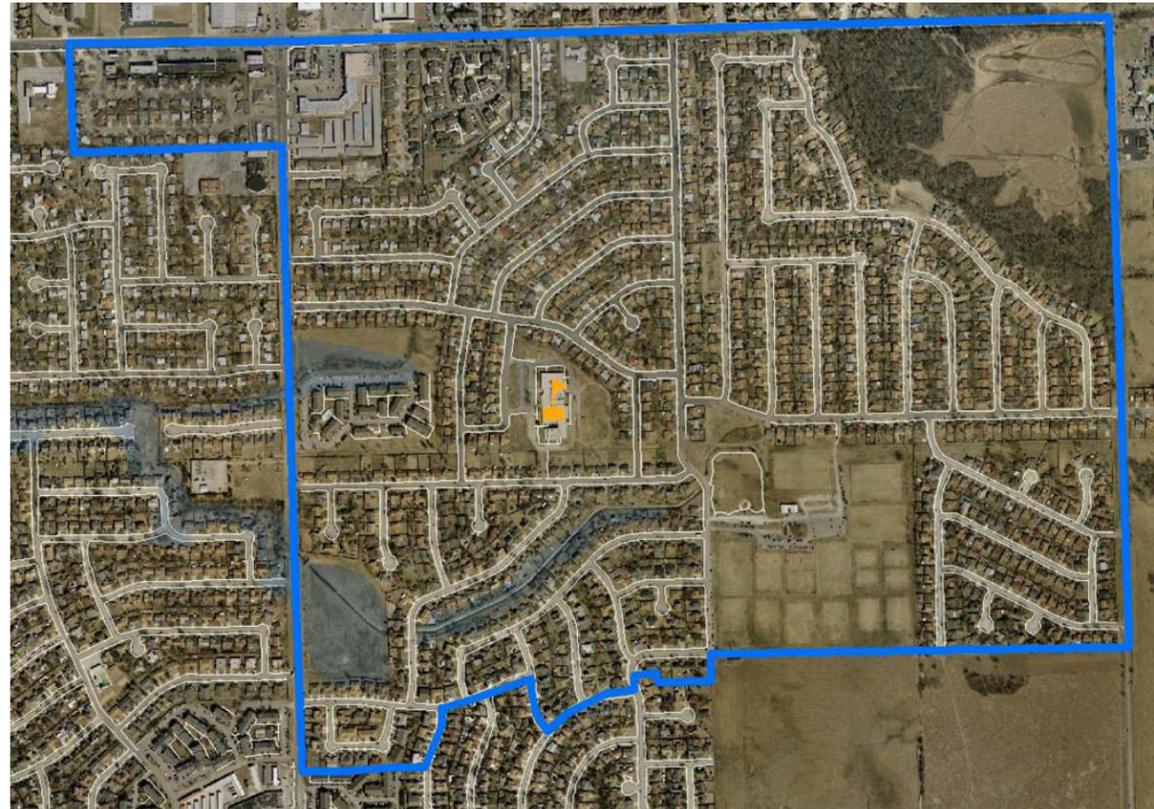


Housing in the Boevers Elementary Enrollment Area



# Boevers

## Enrollment Area



The main Boevers Elementary School boundary lines are 31st and 41st to the north and south and 129th E Ave and 145th E Ave to the west and east. The enrollment area lies within a square mile except for a small neighborhood that is bordered by 31st to the north, but actually lies to the west of 129th E Ave. This area is much closer to Briarglen Elementary but currently is included in the Boevers enrollment area. Some areas just north of 41st St. that might appear to attend Boevers are actually bused to Rosa Parks. Boevers Elementary is located roughly in the center of a residential neighborhood comprised mostly of single family units, with some duplexes and apartment complexes with good sidewalk connectivity as indicated by the white lines.

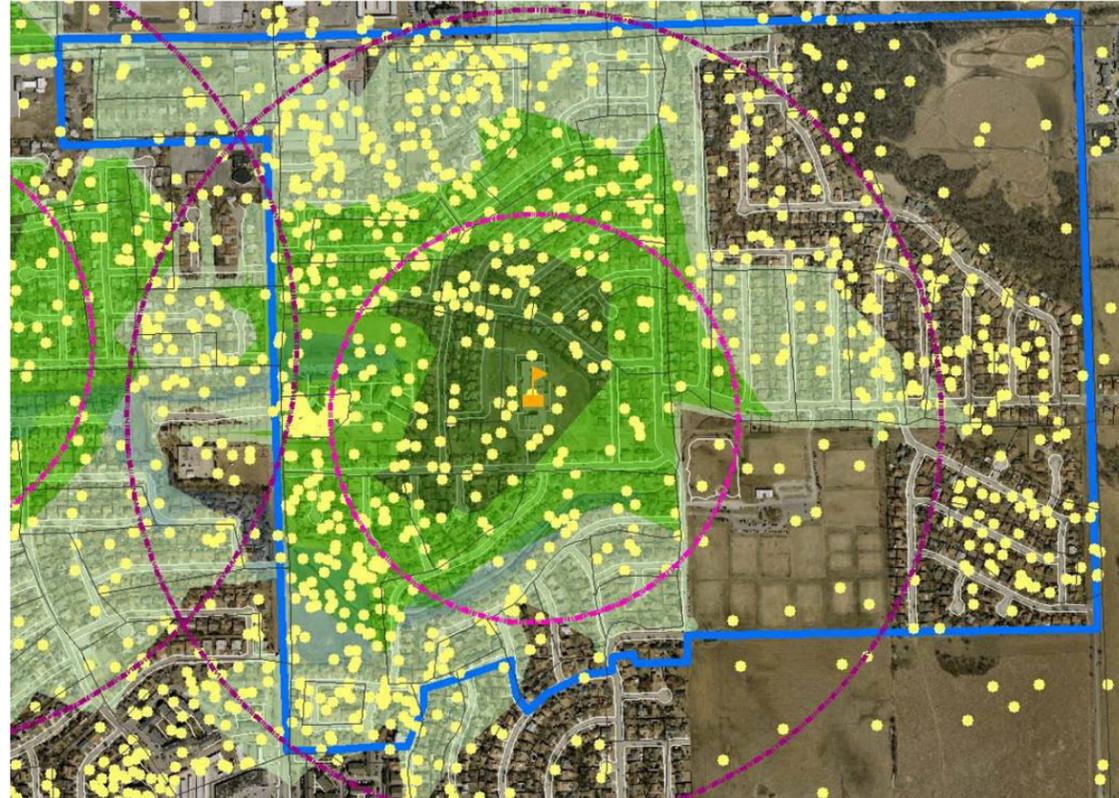
## Population Density



This map shows yellow dots representing the school age children in each census block with two yellow dots per child. The program used has a random aspect to it which causes there to appear to be children living in unpopulated areas at times, but it gives a good approximation of distances many children must travel and the population density of where they live as well. Boevers students are relatively evenly distributed over their enrollment area but with more density in the apartment complexes.

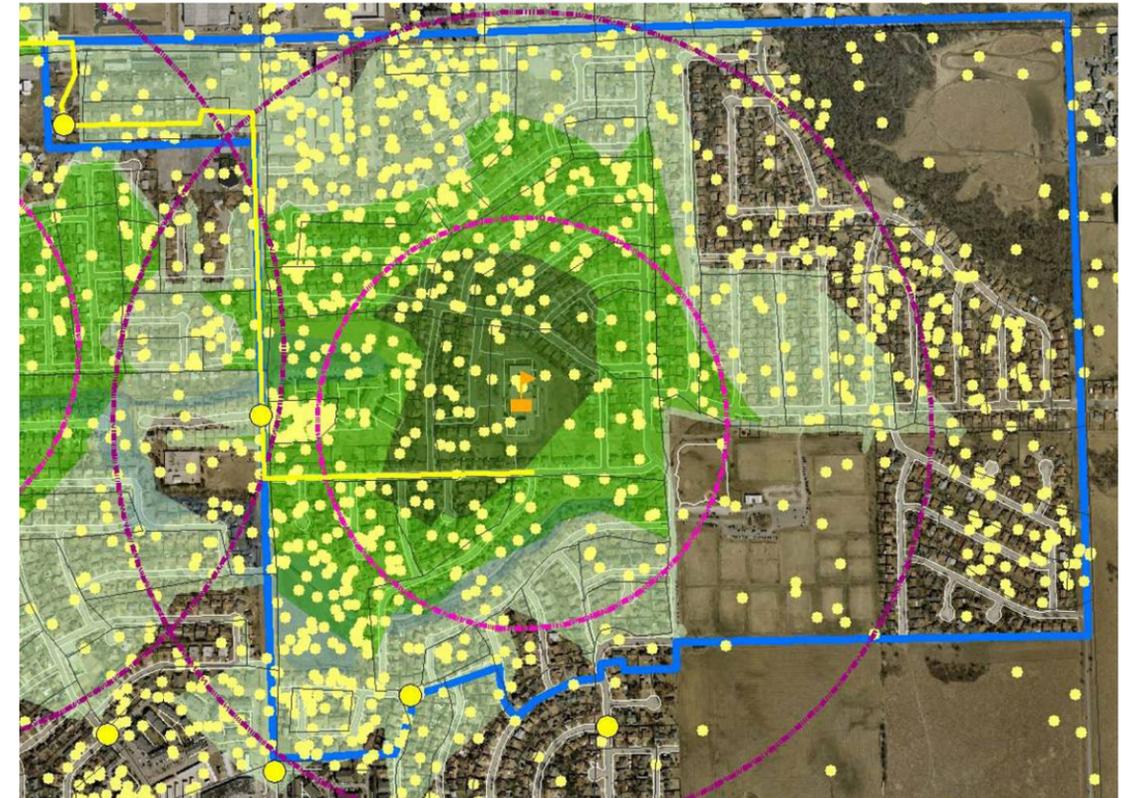
# Boevers

## Service Area



The magenta and plum circles in this map represent quarter and half mile buffers around Boevers. Some of the enrollment area is captured within these buffers. The green shading indicates areas where the paths children would actually need to use if walking to school measure under a quarter or half mile, when taking into account barriers and sidewalk infrastructure. *Some students are within a half mile walking distance of the school, even if the routes taken are indirect, but there are also many that would have considerably farther to walk.*

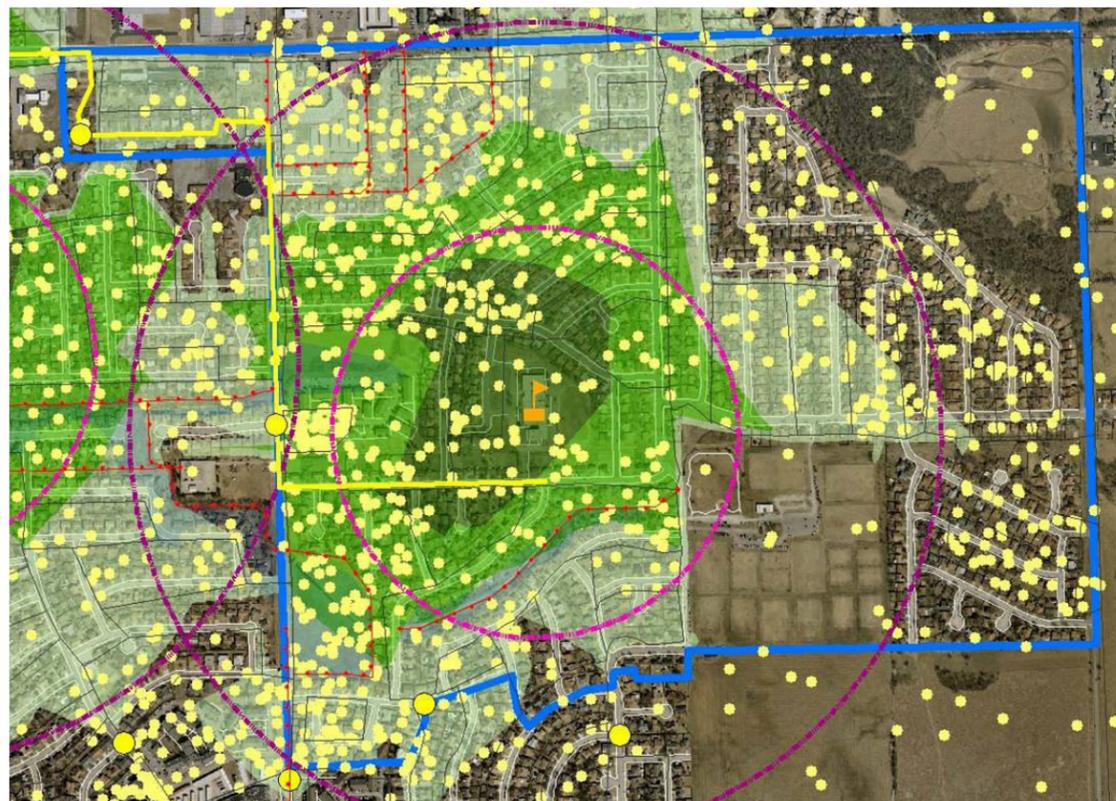
## Bus Routes



Boevers has one bus route shown in yellow, with large yellow dots representing the stops where the bus picks up, such as in the neighborhood west of 129th E Ave. *While the enrollment area is small, a bus is currently needed to service the isolated populations.*

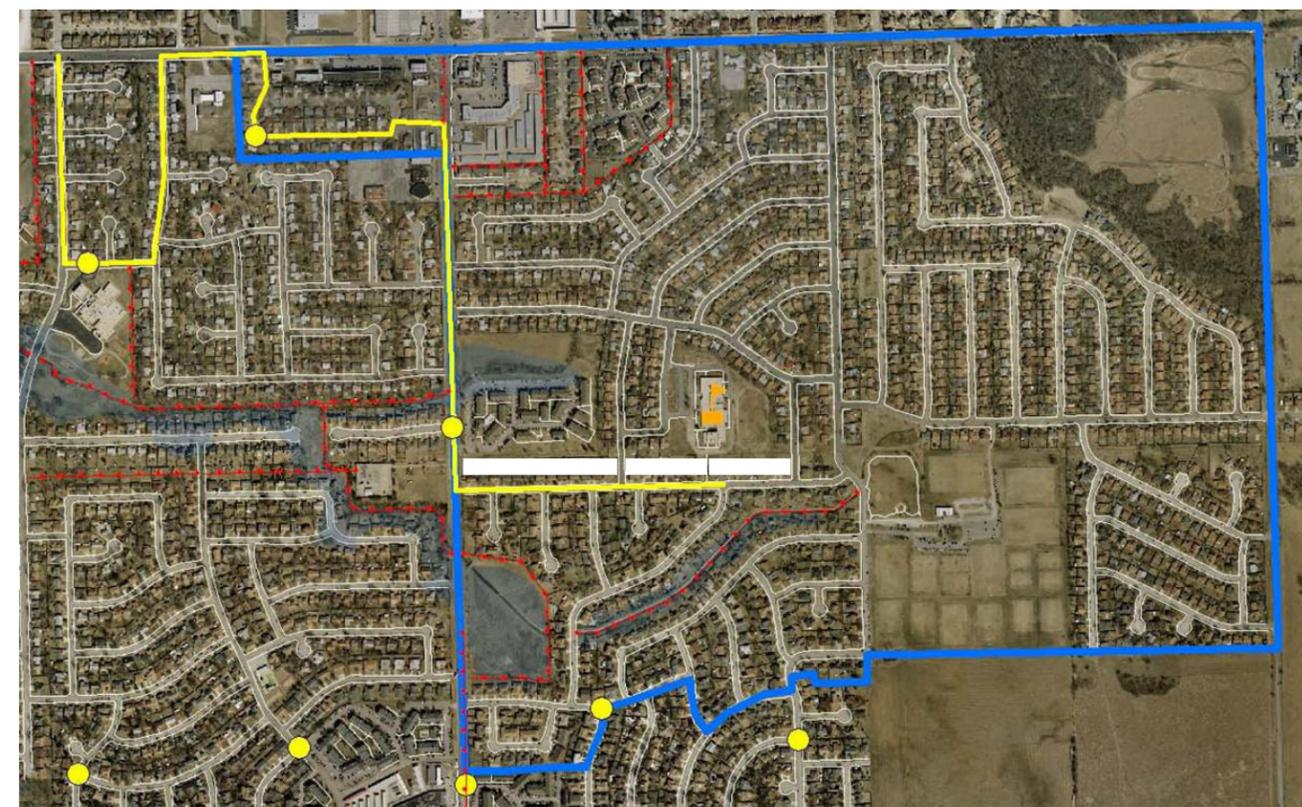
# Boevers

## Barriers



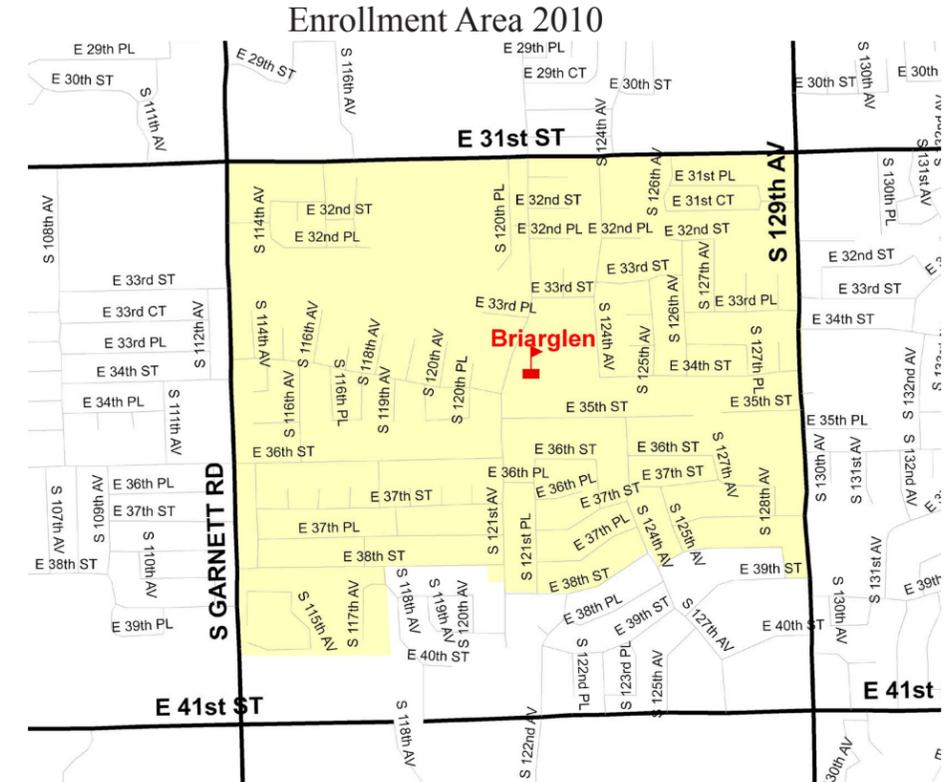
The red dotted lines on this map represent barriers to active transportation. Most of the barriers are fences without gates which do not promote connectivity. There remains the potential that with cooperation between the school and the neighborhood, homeowners might allow access that when combined with utility easements could allow paths for the isolated students. The most notable barriers are the creek and the fence lines.

## Recommendations



Boevers students would benefit from an effort to have paths put in place for them in certain areas, like along some of the utility easements. These could provide a way to cut down on the walking distance in some areas. This would be especially helpful for the Sawmill Apartments residents, with a gate strategically placed within their fence. In the northeast quadrant of the school district, streets offer especially poor connectivity; students there would be helped a little by having a path along the utility easement, to the southeast corner of the school.

# Briarglen Overview



## Information

In the fall of 1970, classes started at Briarglen Elementary, making Briarglen the oldest of the elementary schools in the district. It was named after the housing addition in which it was built. Today Briarglen serves approximately 600 students in Pre-K through 5th grade traditional and looping classrooms.

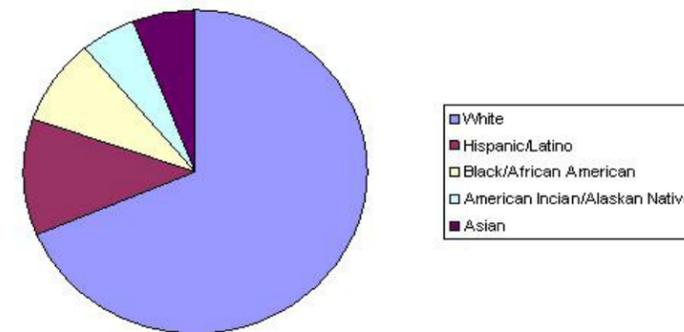
Briarglen Elementary School  
 3303 S. 121st E. Ave.  
 Tulsa, Oklahoma 74146-2200

Office Hours: 7:30 a.m. - 4:30 p.m.  
 School Hours: 8:55 a.m. - 3:25 p.m.  
 Main Phone: (918) 357-4330  
 Fax: (918) 357-8499

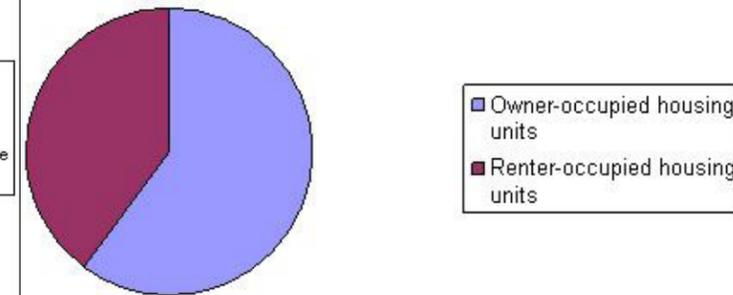
Principal Tamra Bird  
 Administrative Intern Tara Schiffelbein

## Census

Ethnicity within Briarglen Elementary Enrollment Area

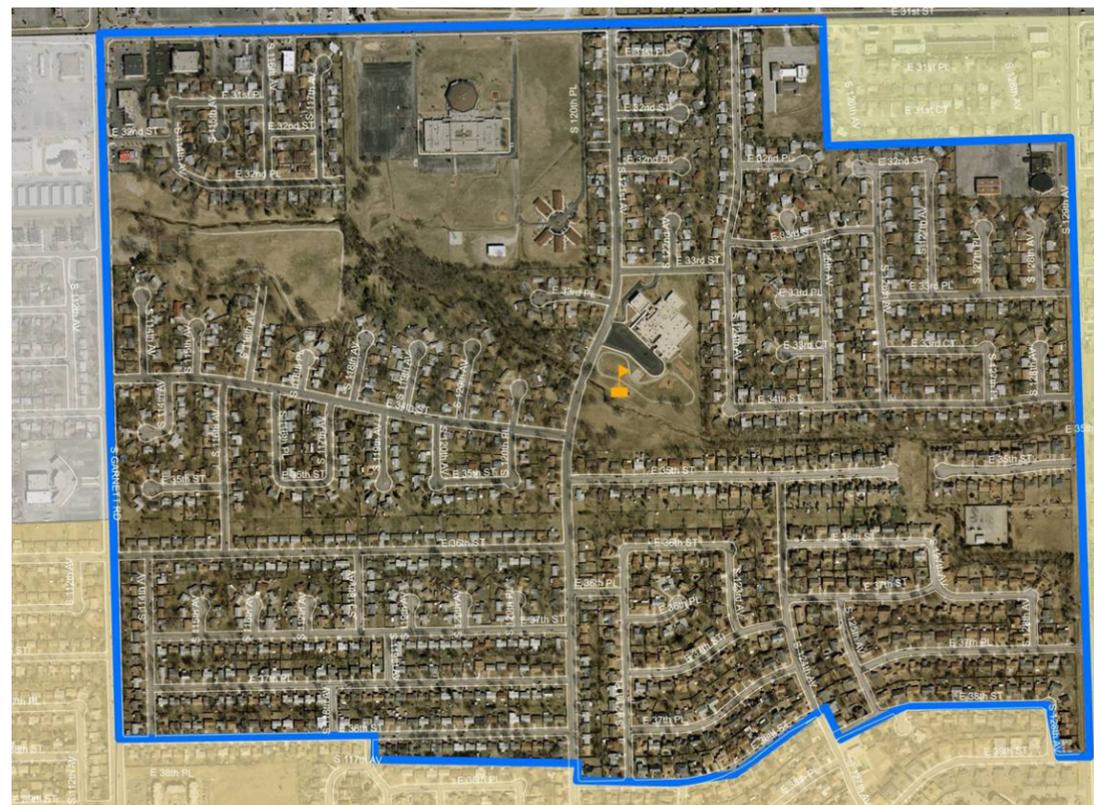


Housing in the Briarglen Elementary Enrollment Area



# Briarglen

## Enrollment Area



The Briarglen enrollment area, framed by 31st and 41st to the north and south and Garnett and 129th to the west and east, is a compact area under one square mile. The elementary school is centrally located in a residential neighborhood comprised entirely of single family units. The neighborhood has good sidewalk connectivity, as indicated by the white lines. *Based on the location, sidewalk availability and small size of the enrollment area, Briarglen immediately appears to be good candidate for active transportation.*

## Population Density



The population density of school aged children in each census block is represented by the yellow dots. Each school aged child is represented by 2 dots. *Briarglen students are evenly distributed throughout the enrollment area.*

# Briarglen

## Service Area



The circles in this map represent quarter and half mile buffers around Briarglen. Nearly the entire enrollment area is captured within the half mile buffer. The green highlights indicate paths that measure under a quarter, half mile and three fourths mile, taking into account sidewalk infrastructure. *Nearly all students are within a three fourths mile walking distance of the school, even if the routes taken are indirect.*

## Bus Routes



The Briarglen bus route is shown in yellow, with two dots representing the stops. *While the enrollment area is small, a bus is needed to service two isolated populations.*



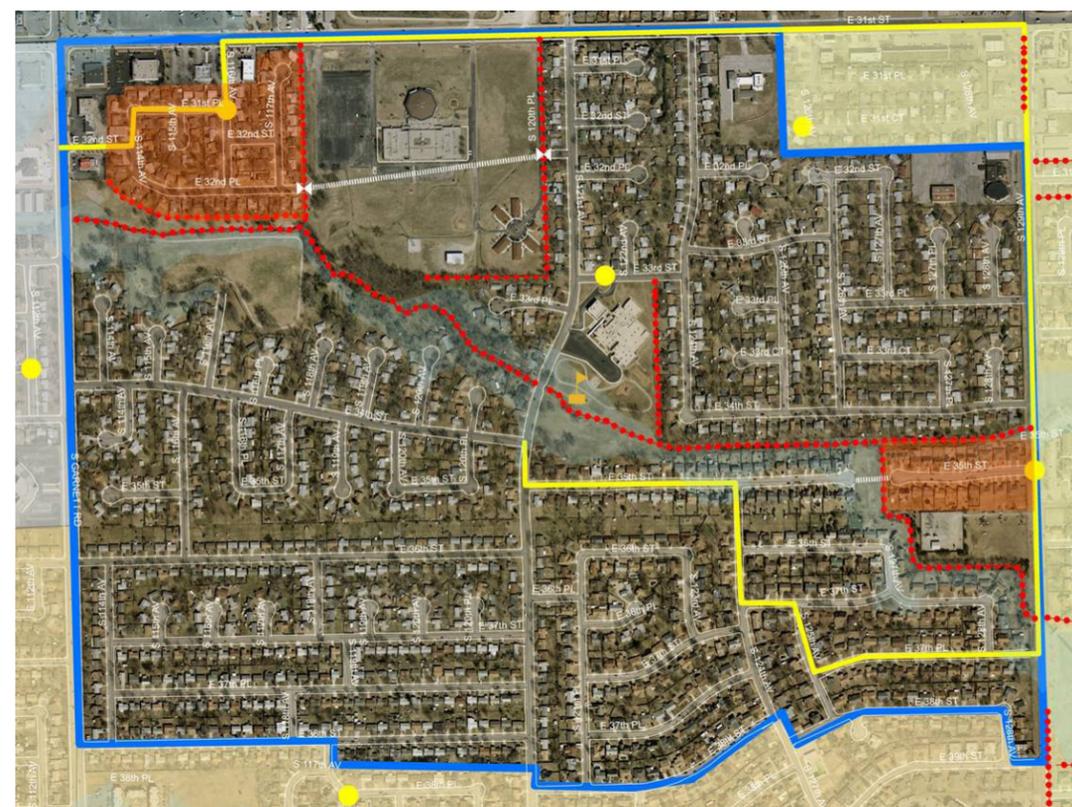
# Briarglen

## Barriers



The red dotted lines in this map represent barriers to active transportation. The most notable barriers are fences and the creek bisecting the neighborhood. The development to the northwest is isolated primarily by fences. Currently, in order to walk to the school, a student must exit the neighborhood, travel along arterial streets and re-enter the neighborhood. The E 35th St cul-de-sac is another enclave isolated by the creek which separates it from the opposing cul-de-sac. Students from this street would have to travel east to 129th, (which lacks sidewalks) and then re-enter at E 34th street. Alternatively, students may cross the creek (when dry) to the abutting cul-de-sac.

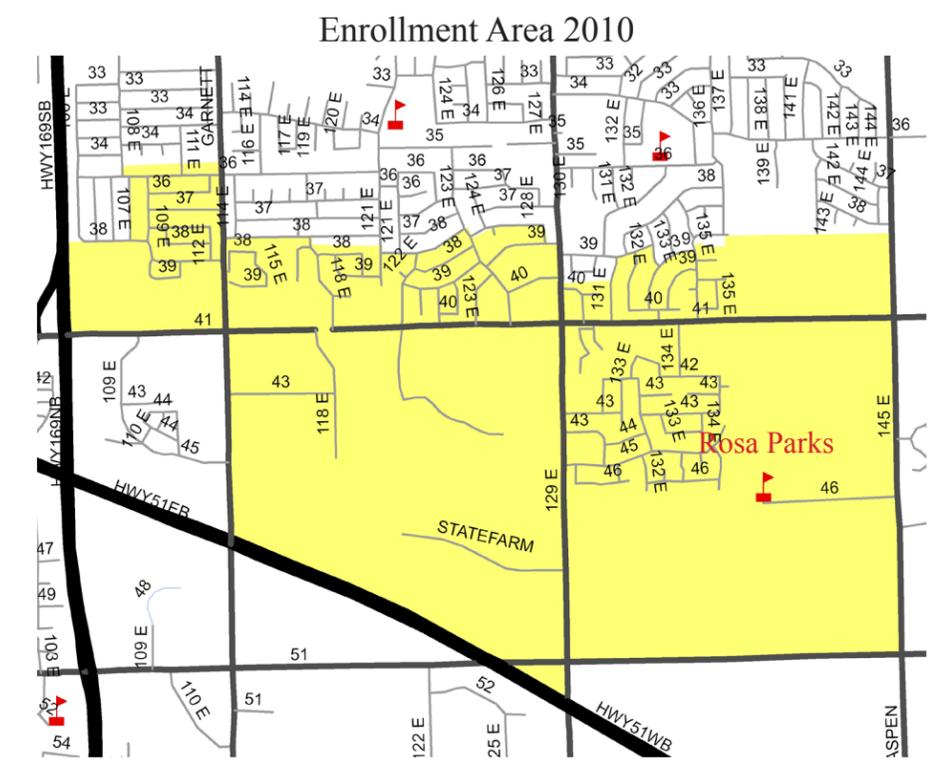
## Recommendations



The northwest enclave could easily be connected to the neighborhood street grid by eliminating fence line barriers. The Garnett Church of Christ is situated between the enclave and the school. Residents may be able to obtain an easement from the church for pedestrians to cross safely through the southern portion of their property. Fence lines extend across dead-end streets on either side of the church and could be opened or converted to gates to accommodate pedestrians without affecting residents' private property. The E 35th St enclave could be connected to the opposing cul-de-sac with a small bridge. Footpaths through this barrier indicate a need to safely accommodate pedestrians wishing to cross. The Briarglen bus route appears to exist only to serve these two enclaves. Simple solutions could create greater path connectivity, eliminate the Briarglen bus service and achieve 90%-100% active transportation to the elementary school.



# Rosa Parks Overview



## Information

Rosa Parks is the 12th elementary school in the Union District and opened in August of 2006. Our school currently serves more than 600 ethnically diverse students and includes children from pre-K-ergarten through fifth grade.

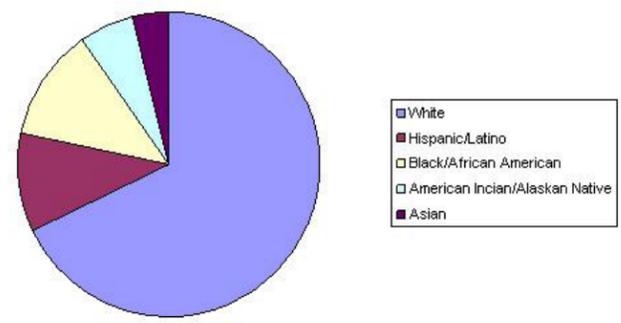
Rosa Parks Elementary School  
 13702 E. 46th Place South  
 Tulsa, Oklahoma 74134-5919

Office Hours: 7:30 a.m. - 4:30 p.m.  
 School Hours: 8:55 a.m. - 3:25 p.m.  
 Main Phone: (918) 357-2757  
 Fax: (918) 357-6899

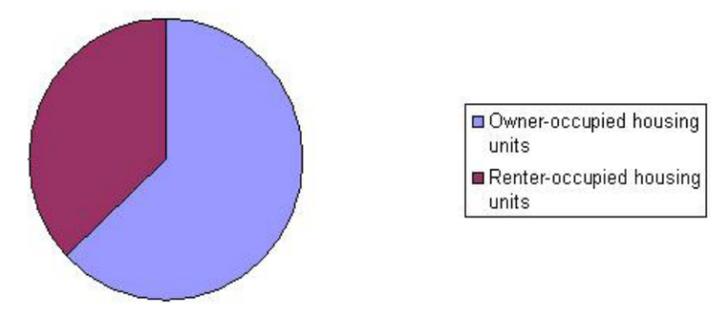
Principal Karen Vance  
 Assistant Principal Alycia Pennington

## Census

Ethnicity within Rosa Parks Elementary Enrollment Area



Housing in the Rosa Parks Elementary Enrollment Area



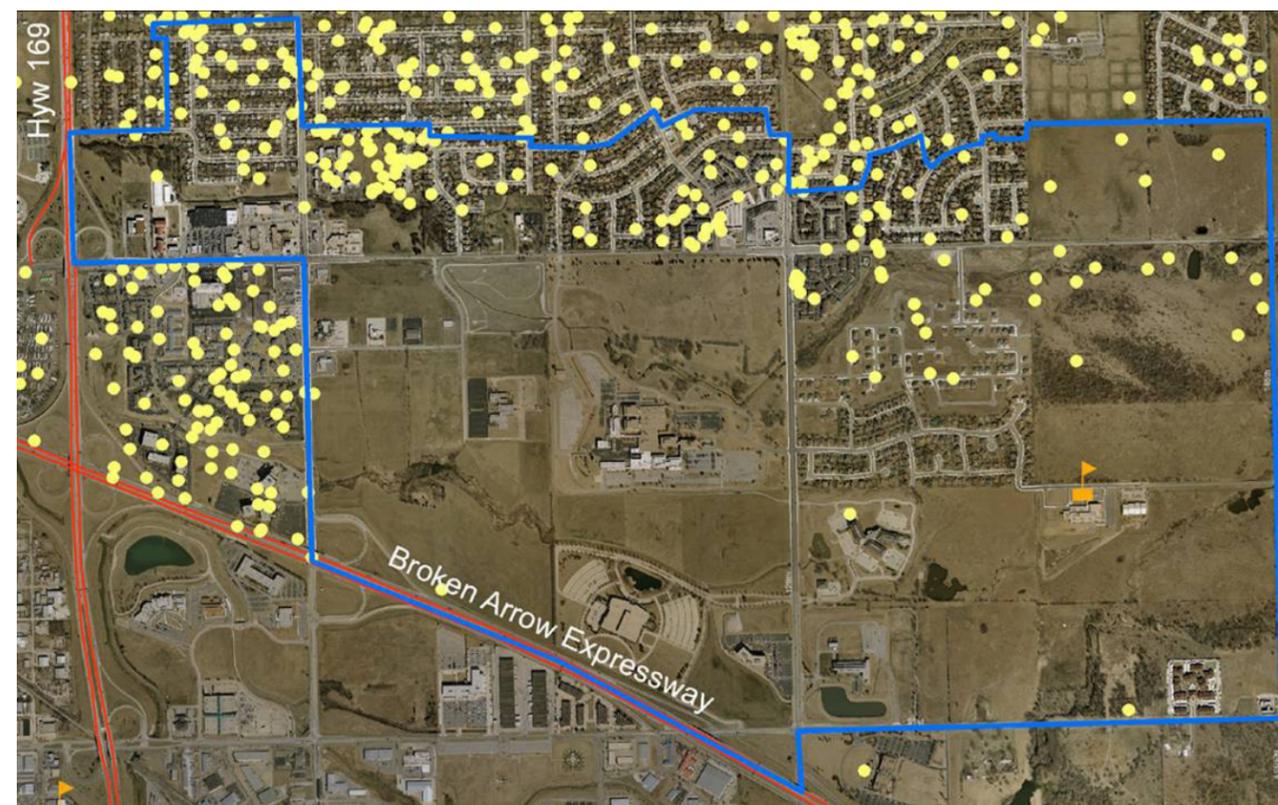
# Rosa Parks

## Enrollment Area



The Rosa Parks enrollment area is framed by neighborhoods just north of 41st St on the north and 51st to the Broken Arrow Expressway on the south. While the enrollment area for Rosa Parks extends from Mingo on the west to 145th E Ave to the east. Rosa Parks is primarily surrounded by land zoned agricultural. The neighborhood which has been developed has good sidewalk connectivity, as indicated by the white lines. Based on its location, the long enrollment area distance (requiring multiple arterial crossings) and the fact the area has not been built out makes the school a poor candidate for active transportation.

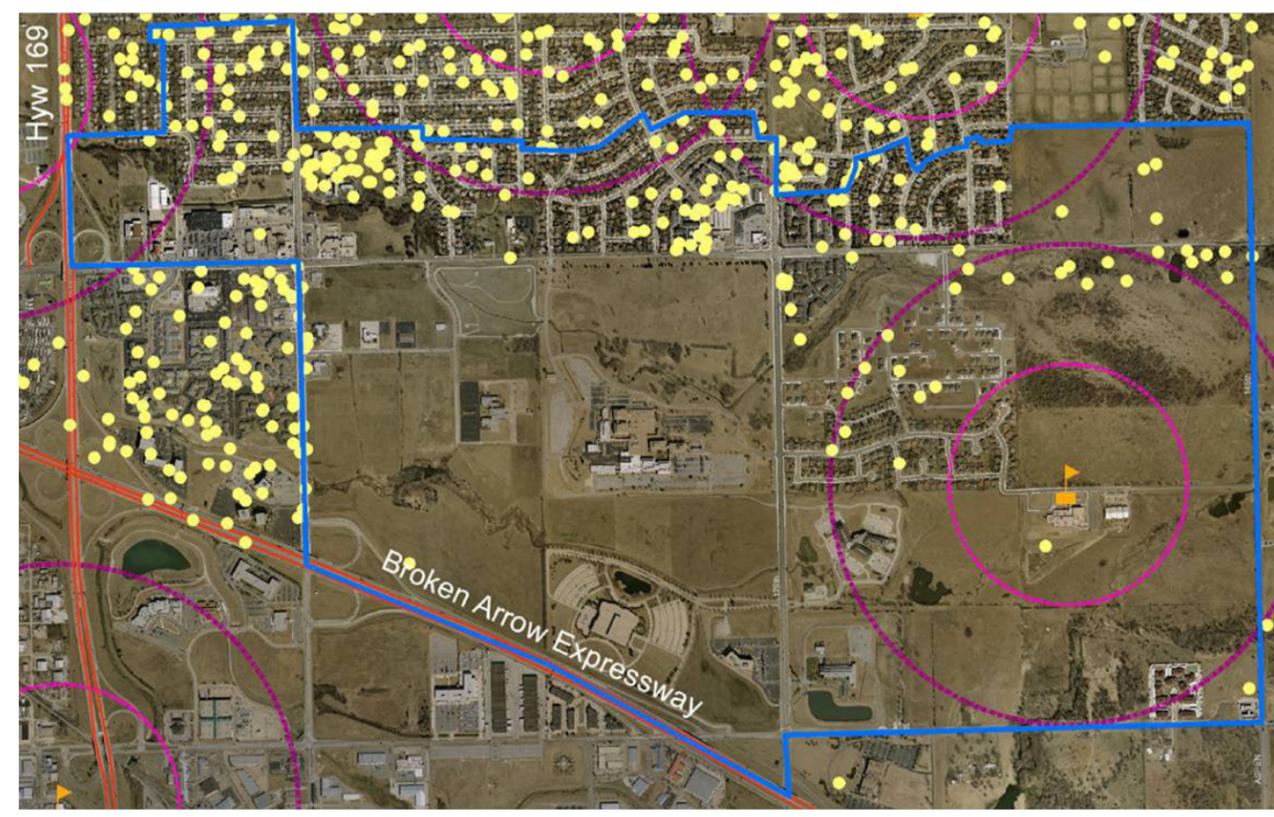
## Population Density



The population density of school aged children in each census block is represented by the yellow dots. Each school aged child is represented by 2 dots. Rosa Parks students are densely populated in the corners of several major intersections, these intersections primarily consist of multi-family housing. There are large areas with no population.

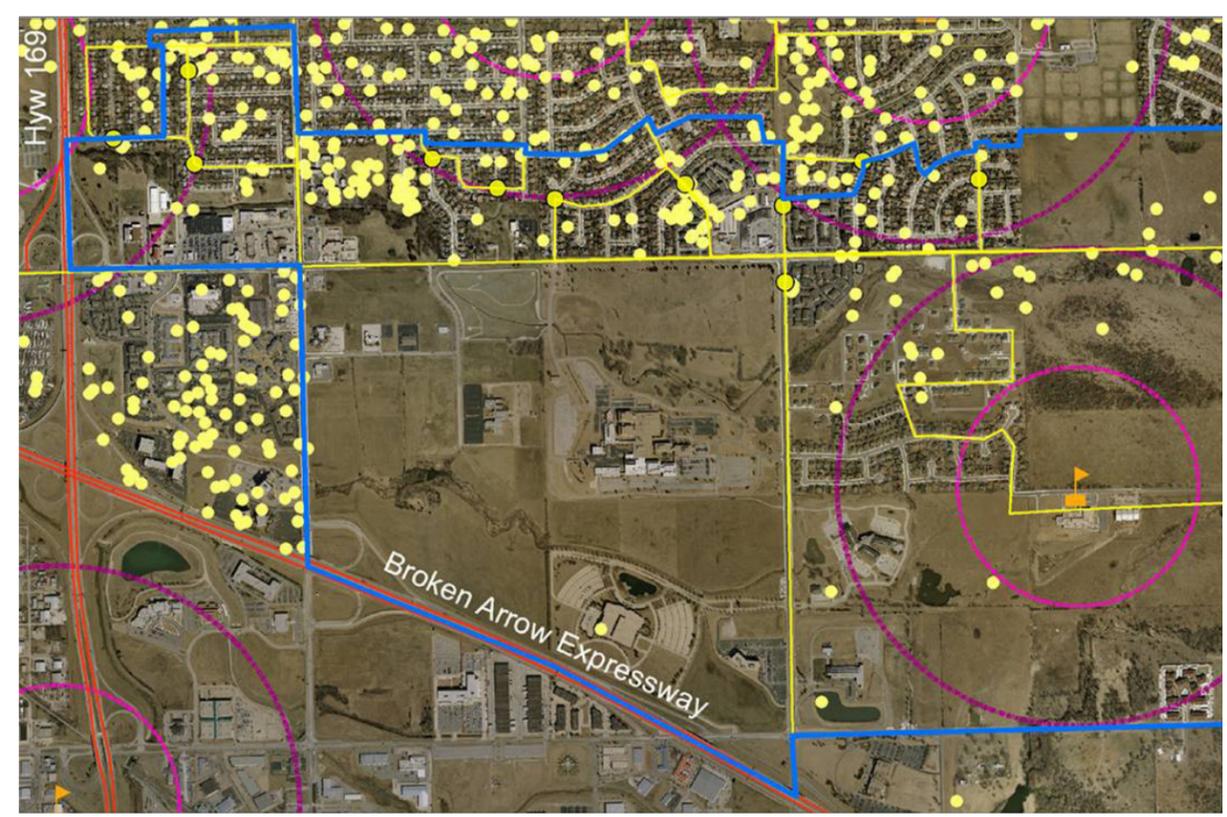
# Rosa Parks

## Service Area



The circles in this map represent quarter and half mile buffers around Rosa Parks. In essence, almost none of the student enrollment is captured within the half mile buffer. Few students are within a half mile walking distance of the school.

## Bus Routes

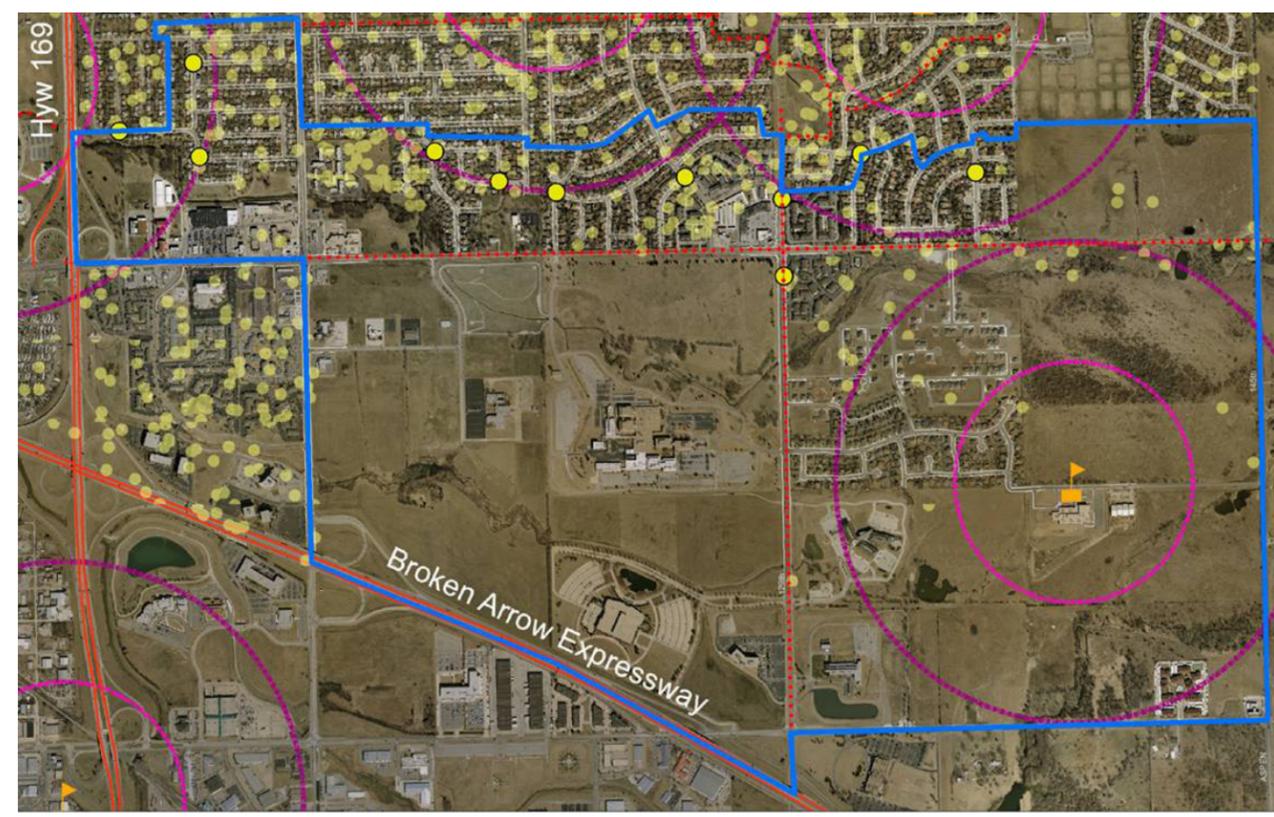


Rosa Parks has six bus routes which are shown in yellow, with yellow dots representing the stops. Because the enrollment area is large, buses will be needed to service the majority of the populations.



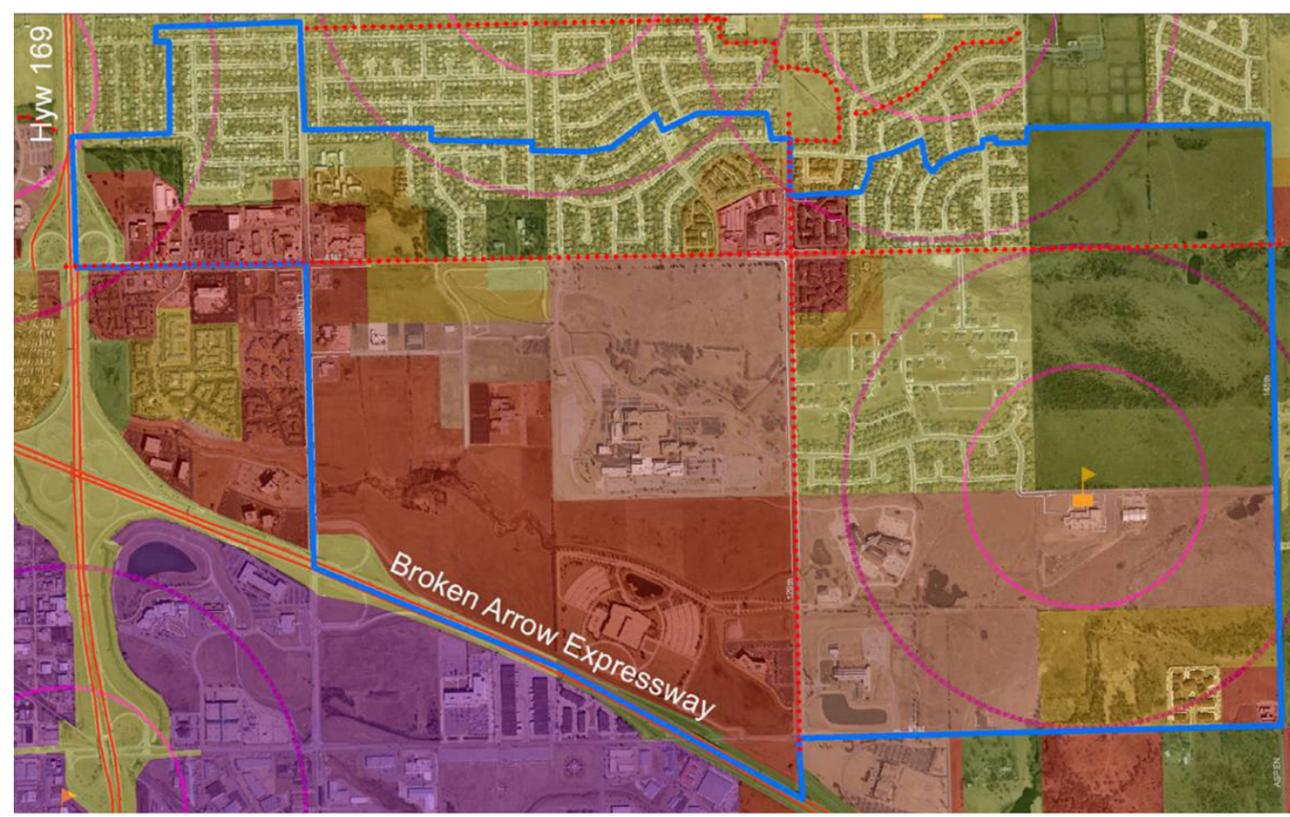
# Rosa Parks

## Barriers



The red dotted lines in this map represent barriers to active transportation. The most notable barriers are arterial streets, with 5 lanes, bisecting the neighborhoods.

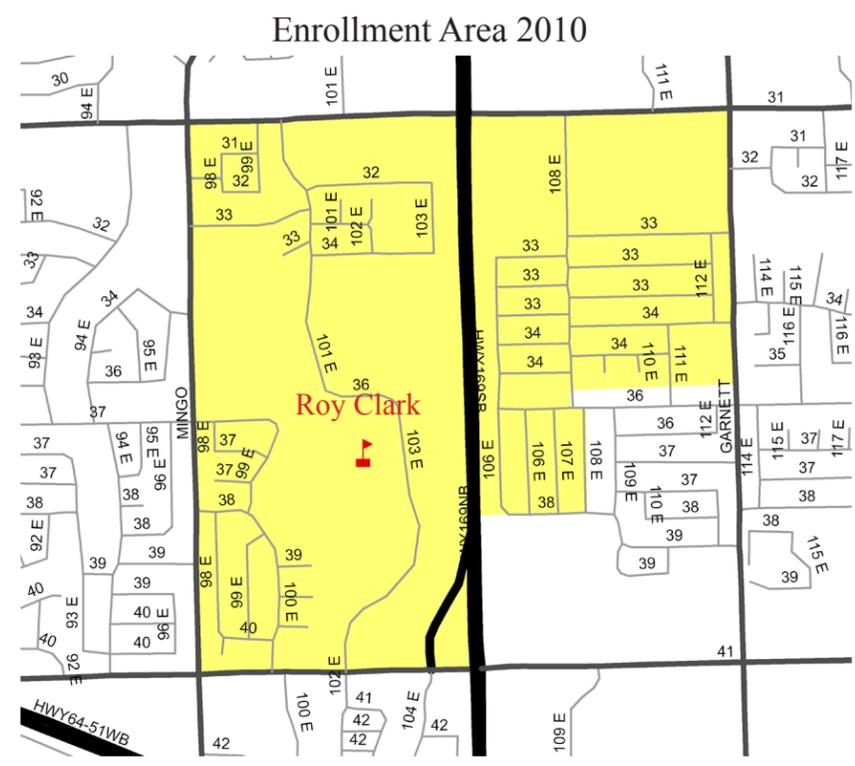
## Recomendations



Rosa Parks is not recommended as a good candidate for active transportation. However, Union Public Schools in conjunction with the City of Tulsa are in a great position to make Rosa Parks an example of better planning, connectivity, and community pride, through considering the needs of future residents and the school in future development.



# Roy Clark Overview



## Information

Roy Clark Elementary, built in 1977 and dedicated in 1978, was named for the native Oklahoma musician and entertainer. Roy Clark has maintained close ties with the school and even masterminded a benefit concert for students in 2007, donating \$25,000 to the school's music department.

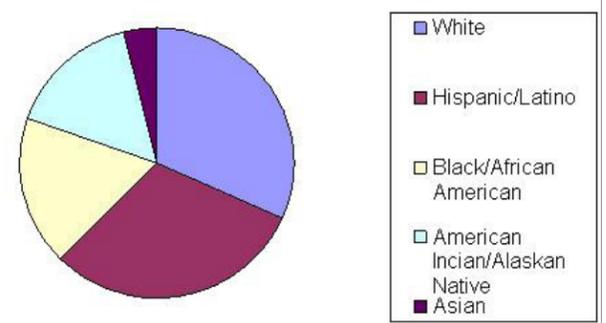
Roy Clark Elementary School  
 3656 S. 103rd E. Ave.  
 Tulsa, Oklahoma 74146-2441

Office Hours: 7:30 a.m. - 4:30 p.m.  
 School Hours: 8:55 a.m. - 3:25 p.m.  
 Main Phone: (918) 357-4332  
 Fax: (918) 357-8599

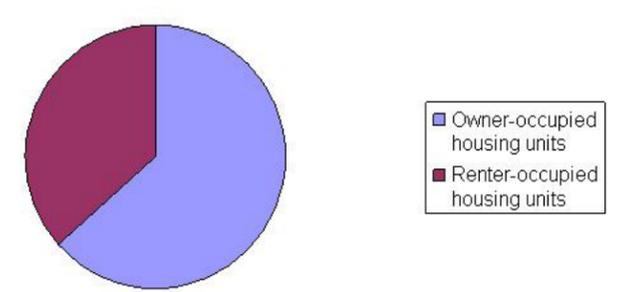
Principal Theresa Kiger  
 Assistant Principal Wendy Johnson

## Census

Ethnicity within Roy Clark Elementary Enrollment Area



Housing in the Roy Clark Elementary Enrollment Area



**Active Transportation:  
 A Feasibility Analysis For  
 Elementary Schools**



# Roy Clark

## Enrollment Area



Roy Clark has a compact enrollment area less than one square mile, that is bisected by US 169 and Mingo Creek. Yet, it is still a good candidate for active transportation. The enrollment area is located between 31st St. in the north, 41st St. in the south, Garnett on the east, and Mingo on the west.

## Population Density



This map shows yellow dots representing the school age children in each census block with two yellow dots for each child. The program we used has a random aspect to it which causes there to appear to be children living in unpopulated areas at times, but it gives us a good look at distances many children must travel and the density of where they live as well.

The Roy Clark enrollment area has two large concentrations of students. They are both circled in yellow. The area with the most density is the apartment complex on the corner of 31st and Mingo.

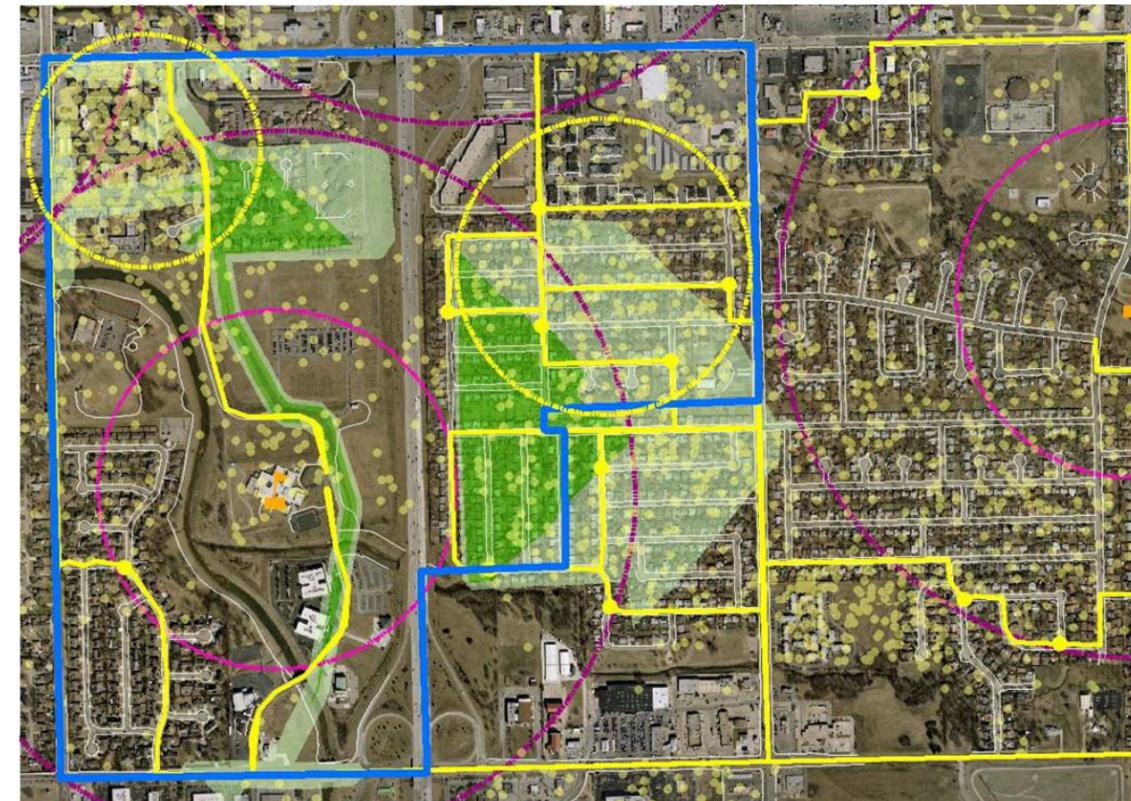
# Roy Clark

## Service Area



The magenta circles in this map represent quarter and half mile buffers around Roy Clark. Nearly the entire enrollment area is captured within the half mile buffer. The green shading highlights indicate paths that measure under a quarter, half mile, and three fourths mile, taking into account sidewalk infrastructure. This map shows that the most densely populated areas are within a three fourths mile walking distance of the school, even if the routes taken are indirect.

## Bus Routes



Roy Clark has five bus routes that are shown in yellow, with larger yellow dots representing the stops. While the enrollment area is small, five buses are needed to service the isolated populations.

# Roy Clark

## Barriers



The Roy Clark enrollment area has two significant barriers: Mingo Creek and US Highway 169. The school is isolated from almost all residential areas by these barriers and is accessible only from the north and south by one road. Very few students currently walk or cycle to school. Another barrier is a fence located around the apartment complex on the corner of 31st and Mingo.



# Roy Clark

## Recomendations



US Highway 169 is immediately east of the school. There is a 190' long pedestrian tunnel connecting the school side to residential areas to the east, however it does not appear that the Oklahoma Department of Transportation is maintaining this connection. The tunnel was observed to have standing water on the east end due to poor grading and drainage. No lighting has been provided even though electrical conduit exists for this purpose. If this tunnel was maintained and utilized as many as four school bus routes could be eliminated at a saving the school money every year. A crossing guard or parent volunteer is needed at the tunnel before and after school, for security.

The engineered channel of Mingo Creek runs on the west side of the school cutting off another residential area. A 230' bridge with approach paths would be needed to connect the two sides, which could eliminate one bus route.

An apartment complex in the far Northwest corner of the enrollment area is fenced in and cut-off from the residential street system leading to the school, compelling parents to drive students. An opening in the fence and an access easement by an adjacent apartment complex is needed to allow students a walking route.

Inside the US169 tunnel



Looking across from Mingo Creek



# Future Applications

Active transportation mapping is a method of determining active transportation feasibility which can be generalized for use on a larger scale. With support at the city and school district level, this method could be used for schools throughout Tulsa. Partnerships could be formed between interested parties such as INCOG, the City of Tulsa, Tulsa Hub and the Urban Design Studio to make active transportation a priority and a realistic goal for Tulsa students.

The Union Public School district should consider adding on to existing schools to accommodate growing enrollment before they build another isolated elementary school. Pressed to accommodate a growing school aged population, UPS built a new school, Rosa Parks in 2006. Due to the isolation of the Rosa Parks school site, the school district has chipped away at neighboring schools' enrollment areas. Students who live within walking distance of one school are bussed miles to Rosa Parks. These enrollment areas are subject to change from year to year, creating inconsistency for students. Additionally, as the area surrounding Rosa Parks Elementary develops, the school and city should work with developers to ensure access to the school for students.

Our analysis revealed poor sidewalk maintenance by the city. Many arterials in our study area were not equipped with sidewalks and existing sidewalks are often inhospitable. Pedestrians will find utility poles obstructing their path and vehicles traveling at 40mph whizzing by 4 or 5 feet away. The city should make it a priority to provide adequate sidewalks for citizens. Arterials in the study area operate well under capacity and could feasibly be narrowed to accommodate a more hospitable sidewalk design.

At the planning level, consideration should be taken to encourage development with good connectivity. Previous development patterns feature divisive fence lines, dead end streets and isolated enclaves. Movement should be a priority for planners. Poor planning creates stagnant, automobile-dependent populations. Thoughtful development with good connectivity to nearby resources has the potential to create safer, more vibrant communities.



# Future Applications

In searching for ways to provide our city with healthier types of communities we can look at examples of what works for pedestrian friendly streetscapes, community promoting business districts, and commute reducing neighborhood layout. There may be as many suggestions as there are people considering these aspects of our daily lives, but we must first consider them and also give them importance before they can become reality.

Perhaps there are lessons to be learned from the design of some of the older communities that are still desirable places to live, and even visit. In parts of Europe, and other areas, the practice of street level shops with homes or apartments above them is still common practice. Neighbors tend to become friends as there are reasons to interact on more than rare occasions. Coming and going is a good time to say hello to others when one is not always confined to one's car upon departure and arrival. A walk to a shop that is close to home has been known to be a delightful experience when there is a comfortable sidewalk to use, pleasant landscaping to enjoy, and other friendly pedestrians with even a moment to say hello.

In undeveloped areas within the neighborhoods we looked at, such as near the Boevers Soccer Fields, would it not be an advantage to have community friendly designed buildings that promote a comfortable, safe atmosphere to raise our children, where they can gain a sense of independence as they travel a safe route to and from school each day?



## Journal Articles:

- Black C, Collins A and Snell M. "Encouraging Walking: The Case of Journey-to-School Trips in Compact Urban Areas." *Urban Studies*, 38(7): 1121–1141, June 2001.
- Collins D and Kearns R. "The Safe Journeys of an Enterprising School: Negotiating Landscapes of Opportunity and Risk." *Health & Place*, 7(4): 293–306, December 2001.
- Davison K and Lawson C. "Do Attributes in the Physical Environment Influence Children's Physical Activity? A Review of the Literature." *International Journal of Behavioral Nutrition and Physical Activity*, 3: 19, July 2006.
- Davison K, Werder J and Lawson, C. "Children's Active Commuting to School: Current Knowledge and Future Directions." *Preventing Chronic Disease*, 5(3): A100, July 2008.
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- Fesperman C, Evenson K, Rodriguez D. et al. "A Comparative Case Study on Active Transport to and from School." *Preventing Chronic Disease*, 5(2): A40, April 2008.
- Frank L, Andresen M and Schmid T. "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars." *American Journal of Preventive Medicine*, 27(2): 87–96, August 2004.
- Ham S, Macera C and Lindley C. "Trends in Walking for Transportation in the United States, 1995 and 2001." *Preventing Chronic Disease*, 2(4): A14, October 2005.
- Hume C, Timperio A, Salmon J, et al. "Walking and Cycling to School: Predictors of Increases among Children and Adolescents." *American Journal of Preventive Medicine*, 36(3): 195–200, March 2009.
- Kerr J, Rosenberg D, Sallis J, et al. "Active Commuting to School: Associations with Environment and Parental Concerns." *Medicine and Science in Sports and Exercise*, 38(4): 787–794, April 2006.
- McDonald N. "Active Transportation to School: Trends among U.S. Schoolchildren, 1969–2001." *American Journal of Preventive Medicine*, 32(6): 509–516, June 2007.
- McMillan T. "The Relative Influence of Urban Form on a Child's Travel Mode to School." *Transportation Research Part A: Policy and Practice*, 41(1): 69–79, January 2007.
- McMillan T. "Urban Form and a Child's Trip to School: The Current Literature and a Framework for Future Research." *Journal of Planning Literature*, 19(4): 440–456, May 2005.
- Mendoza J, Levinger D and Johnston B. "Pilot Evaluation of a Walking School Bus Program in a Low-income, Urban Community." *BMC Public Health*, 9: 122, May 2009.
- Moudon A, Lee C, Cheadle A, et al. "Attributes of Environments Supporting Walking." *American Journal of Health Promotion*, 21(5): 448–459, May–June 2007.
- Ward D, Linnan L, Vaughn A, et al. "Characteristics Associated with US Walk to School Programs." *International Journal of Behavioral Nutrition and Physical Activity*, 4: 67, 2007.

## Organizations:

- National Center for Safe Routes to School  
730 Martin Luther King, Jr. Blvd, Suite 300  
Chapel Hill, NC 27599-3430  
866-610-SRTS  
<http://www.saferoutesinfo.org/about/>
- Rails to Trails Conservancy  
The Duke Ellington Building  
2121 Ward Court, NW, 5th Floor  
Washington, DC 20037  
202-331-9696  
[www.railstotrails.org](http://www.railstotrails.org)
- TACSI (Tulsa Area Community Schools Initiative)  
Part of the Community Service Council  
Main Towers Building  
16 East 16th Street, Suite 202  
Tulsa, Oklahoma 74119-4402  
918 / 585-5551 phone  
[www.csctulsa.org](http://www.csctulsa.org)
- Tulsa Public Schools  
Education Service Center  
3027 S. New Haven  
Tulsa, OK 74114  
(918) 746-6800  
[www.tulsaschools.org](http://www.tulsaschools.org)
- Union Public Schools  
Education Service Center  
8506 E. 61st Street  
Tulsa, OK 74133  
(918) 357-4321  
[www.unionps.org](http://www.unionps.org)
- Urban Design Studio at OU Tulsa  
4502 East 41st Street  
Tulsa, Oklahoma 74135  
918.660.3493  
<http://tulsagrad.ou.edu/studio>  
[sschaefer@ou.edu](mailto:sschaefer@ou.edu)

## Booklets:

- Active Living Research  
Designing for Active Transportation  
<http://www.activelivingresearch.org/files/transportationrevised021105.pdf>
- Active Living Research  
Building Evidence to Prevent Childhood Obesity and Support Active Communities  
[http://www.activelivingresearch.org/files/ALR\\_Brief\\_ActiveTransportation.pdf](http://www.activelivingresearch.org/files/ALR_Brief_ActiveTransportation.pdf)
- Active Transportation for America  
The Case for Increased Federal Investment in Bicycling and Walking  
[http://www.railstotrails.org/resources/documents/whatwedo/atfa/ATFA\\_20081020.pdf](http://www.railstotrails.org/resources/documents/whatwedo/atfa/ATFA_20081020.pdf)
- Safe Routes to School  
Many Steps One Tomorrow:  
A report on the first three years of the National Safe Routes to School Program  
[http://www.saferoutesinfo.org/resources/collateral/status\\_report/SRTS\\_3-year\\_report.pdf](http://www.saferoutesinfo.org/resources/collateral/status_report/SRTS_3-year_report.pdf)



The University of Oklahoma Urban Design Studio is founded on a three part mission:

- To train urban design professionals through master's degree programs in architecture and urban studies.
- To advance understanding of the city through research and creative activity.
- To engage in community projects benefiting Tulsa and Northeast Oklahoma.

The Urban Design Studio is always looking for promising students and community partners for its endeavors.

For more information, contact us at:

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 Urban Design Studio  
 450s East 41st Street  
 Tulsa, Oklahoma 74135  
 918.660.3493  
 sschaefer@ou.edu  
 http://tulsagrad.ou.edu/studio



The project team for the Active Transportation Feasibility Analysis are all graduate students studying for masters degrees in architecture and urban studies. From left: Jessica Brent, Marcae' Hilton, Laura Mauck and Jose Villalva.

