

20-MINUTE CITY PROJECT

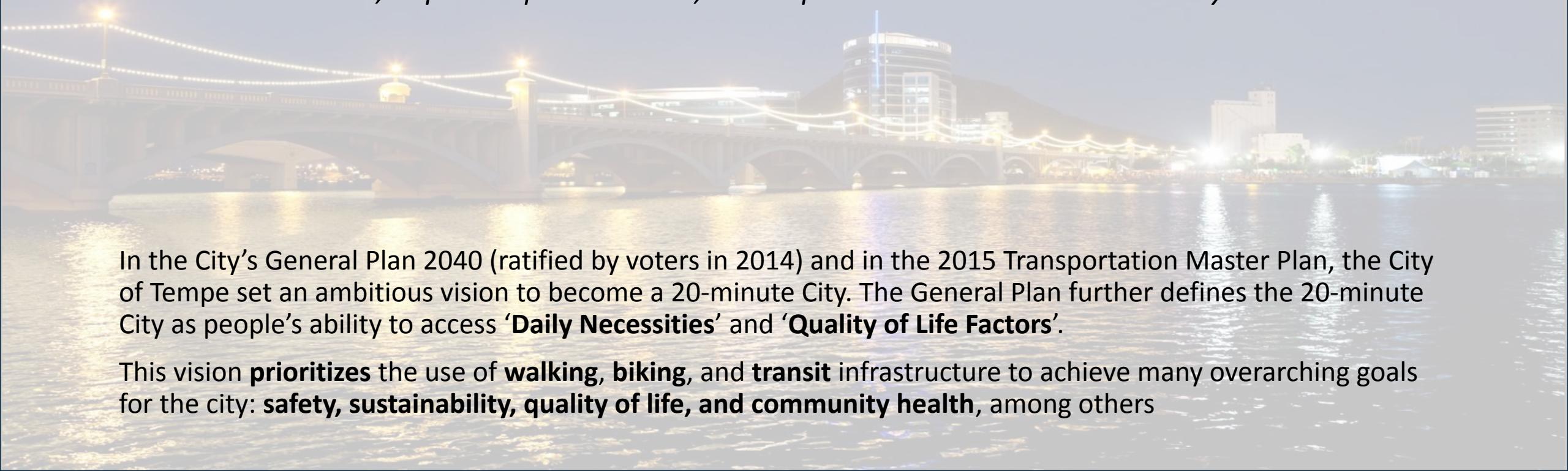
City Studio

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Tempe and the 20-Minute City

A 20-minute City is characterized by a vibrant mix of commercial and residential establishments within a **1-mile walk, 4-mile bike ride, or 20-minute transit ride**. The 20-minute City premise focuses on traditional neighborhood design, transit-oriented development, and complete streets. A few of the many benefits of the 20-minute city are reduced transportation costs, reduced greenhouse gas emissions, improved public health, and improved access to residents' daily needs.



In the City's General Plan 2040 (ratified by voters in 2014) and in the 2015 Transportation Master Plan, the City of Tempe set an ambitious vision to become a 20-minute City. The General Plan further defines the 20-minute City as people's ability to access '**Daily Necessities**' and '**Quality of Life Factors**'.

This vision **prioritizes** the use of **walking, biking, and transit** infrastructure to achieve many overarching goals for the city: **safety, sustainability, quality of life, and community health**, among others

City of Tempe and ASU Collaboration

- The City of Tempe engaged ASU students and faculty for the development of 20-minute city metrics.
- ASU worked with Tempe to establish a baseline measurement for the full city, to document how many residential units are accessible in 20-minutes by walking, biking, or transit.
- The City staff and City Council will then use these baseline measurements to establish targets for transportation system management and prioritization of transportation infrastructure projects.



Baseline Assessment Methodology

Goal

- To develop a baseline for current conditions in Tempe, identify in areas or destination types that are not accessible within 20 minutes by walking, biking or transit.

Factors

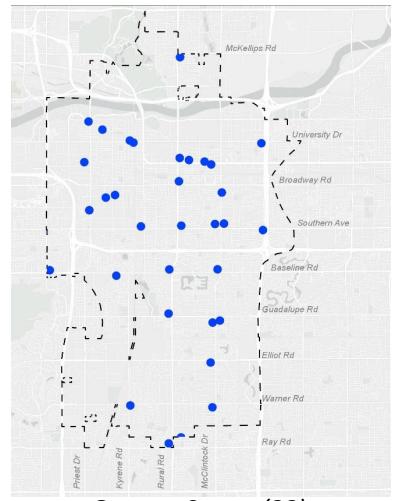
- Destinations - identification of the relevant destinations for daily necessities and quality of life amenities.
- Networks - assessment of the three transportation networks (pedestrian, bicycle, and transit).
- Coverage - comparing the 20-minute City network against the full city limits and the number of residential units reached by each network.



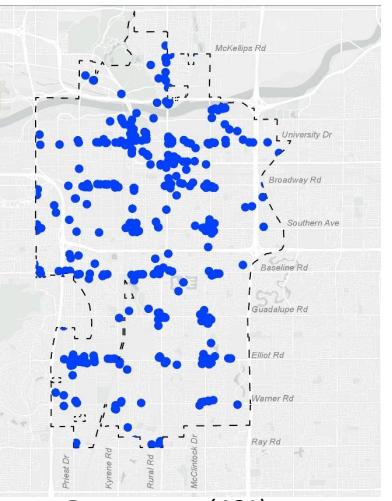
Methodology – Destinations

DESTINATION GROUP	SUBCATEGORIES	DATA
Grocery Stores		NAICS
Restaurants		NAICS
Fitness Centers		NAICS
Retail Goods / Services	Pharmacy / Drug Store, hardware store, bike shops, shopping districts, and convenience stores	NAICS
Parks	Parks, dog parks and preserves	CITY
Schools	Day care, K-12, and higher ed	NAICS
Festivals and Special Event Spaces	Sun Devil Stadium, Wells Fargo Arena, Phoenix Rising Soccer Complex, ASU Gammage, Marquee Theatre, Alberta B. Farrington Softball Stadium, Tempe Beach Park, Kiwanis Park, Downtown, Tempe Diablo Stadium, Tempe Center for the Arts, Galvin Playhouse, Childsplay Theatre, Lyceum Theatre, Katzin Concert Hall, Tempe Library Complex, Tempe Sports Complex	CITY
Civic Institutions	City Offices/Facilities, Fire Stations, Police Stations	CITY
City Recreational and Cultural Amenities	Community Centers, Museums, Libraries, Public Art, Aquatic Centers, Gardens, Zoos, “Points of Pride”	CITY
Services	Banks, Post Office, Beauty Salons / Barber Shops, Laundry / Cleaners	NAICS
Health Services		NAICS
Faith-based Organizations	Houses of worship and faith-based community services	NAICS

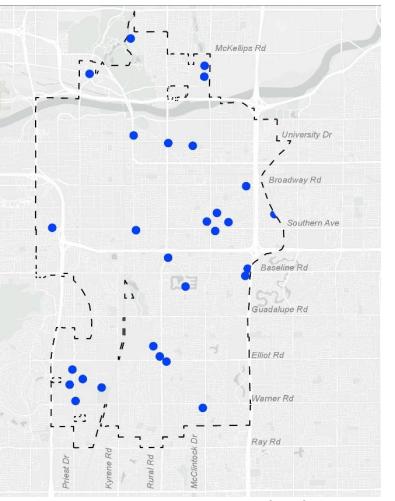
Methodology – Destinations



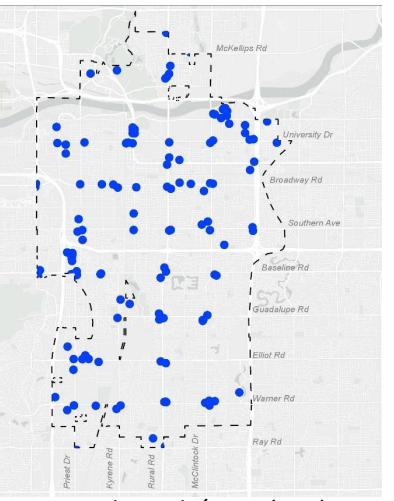
Grocery Stores (33)



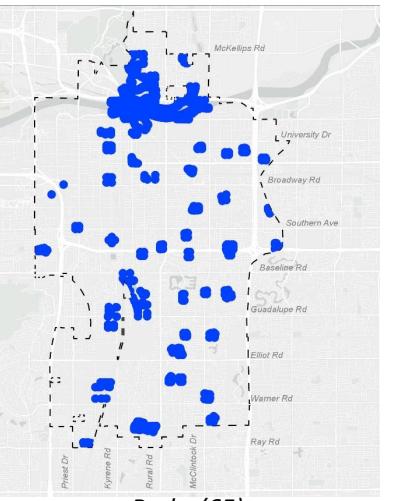
Restaurants (461)



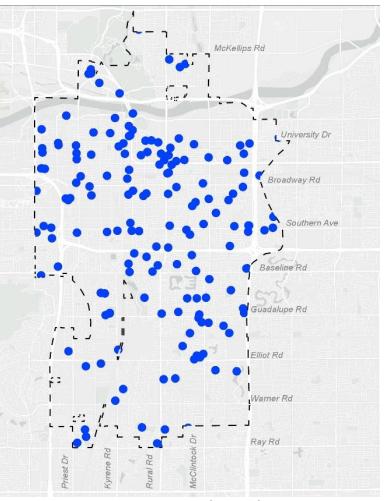
Fitness Centers (28)



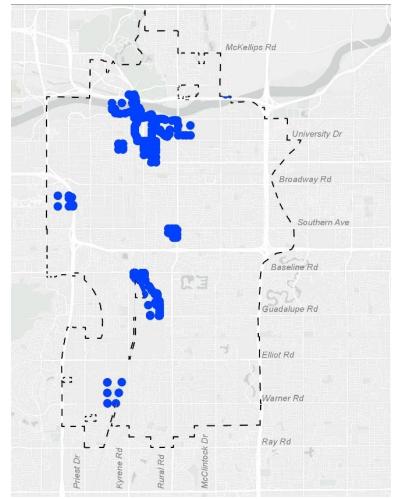
Retail Goods/Svcs. (172)



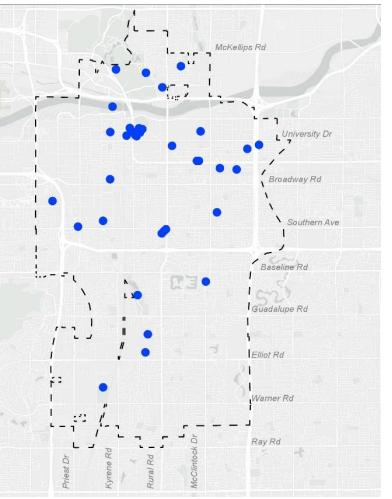
Parks (65)



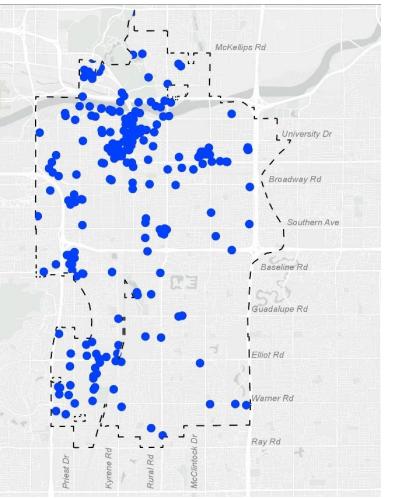
Schools (174)



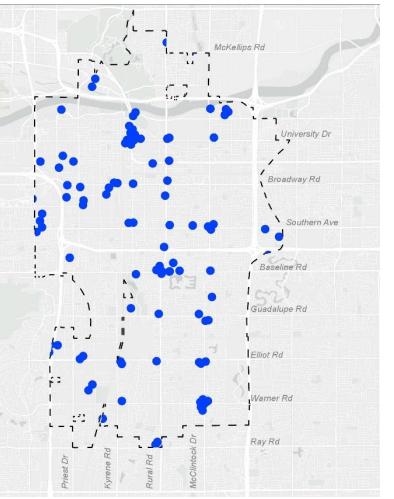
Festival & Special Event Space (15)



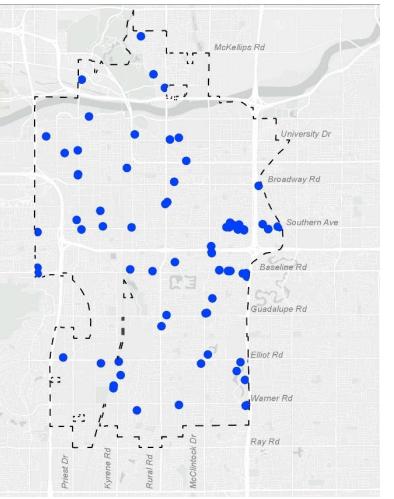
Civic Institutions (37)



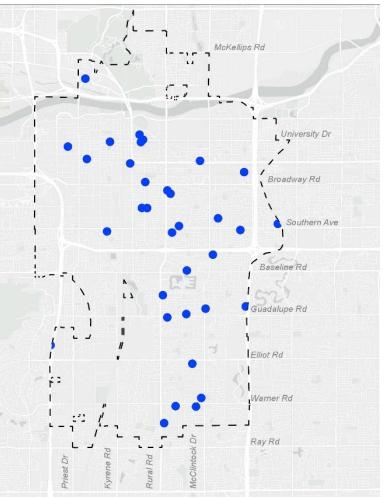
Recreational/Cultural Amenities (258)



Services (101)



Health Services (93)

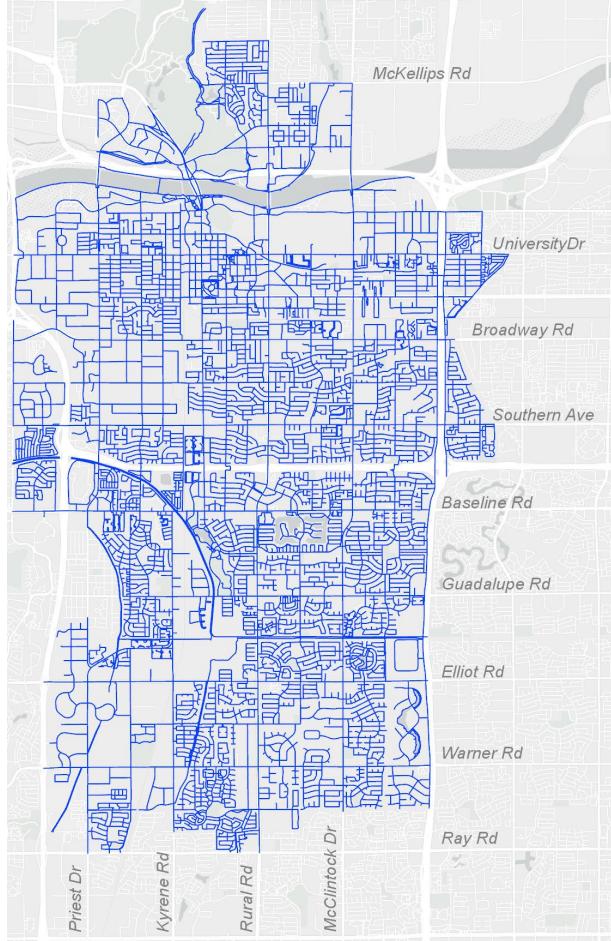


Faith-Based Organizations (33)

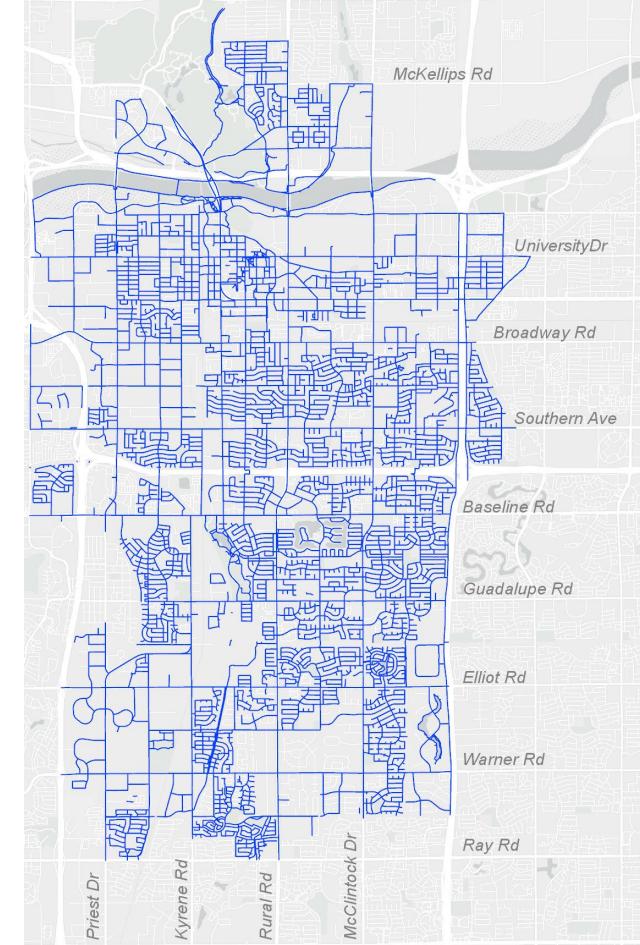
Methodology – Networks

Transportation Mode	Network Data Components	Analysis Travel Sheds
Pedestrian	<ul style="list-style-type: none"> ▪ Sidewalk Network ▪ Off-Street Walkways ▪ Multi-use Paths 	<ul style="list-style-type: none"> ▪ 1-mile (assumed 3-mph travel speed) on all roadways and multi-use paths ▪ 1-mile (assumed 3-mph travel speed) on roadways with sidewalks and multi-use paths
Bicycle	<ul style="list-style-type: none"> ▪ All Roadways ▪ Low-Stress* (Bicycle Level of Traffic Stress 1 and 2) Roadways ▪ Multi-use Paths 	<ul style="list-style-type: none"> ▪ 4-miles (assumed 12-mph travel speed) on all roadways and multi-use paths, and ▪ 4-miles (assumed 12-mph travel speed) on Low-Stress* roadways and multi-use paths
Transit	<ul style="list-style-type: none"> ▪ Pedestrian Network Components (listed above), and ▪ Valley Metro and City Data, which includes: ▪ Transit Routes ▪ Transit Stops ▪ Vehicle Type (e.g. bus, orbit, light rail) 	<ul style="list-style-type: none"> ▪ Assumed door-to-door walking plus transit travel time at 30 minutes (¼-mile walk + 6-mile transit ride + ¼-mile walk)

All Pedestrian Network

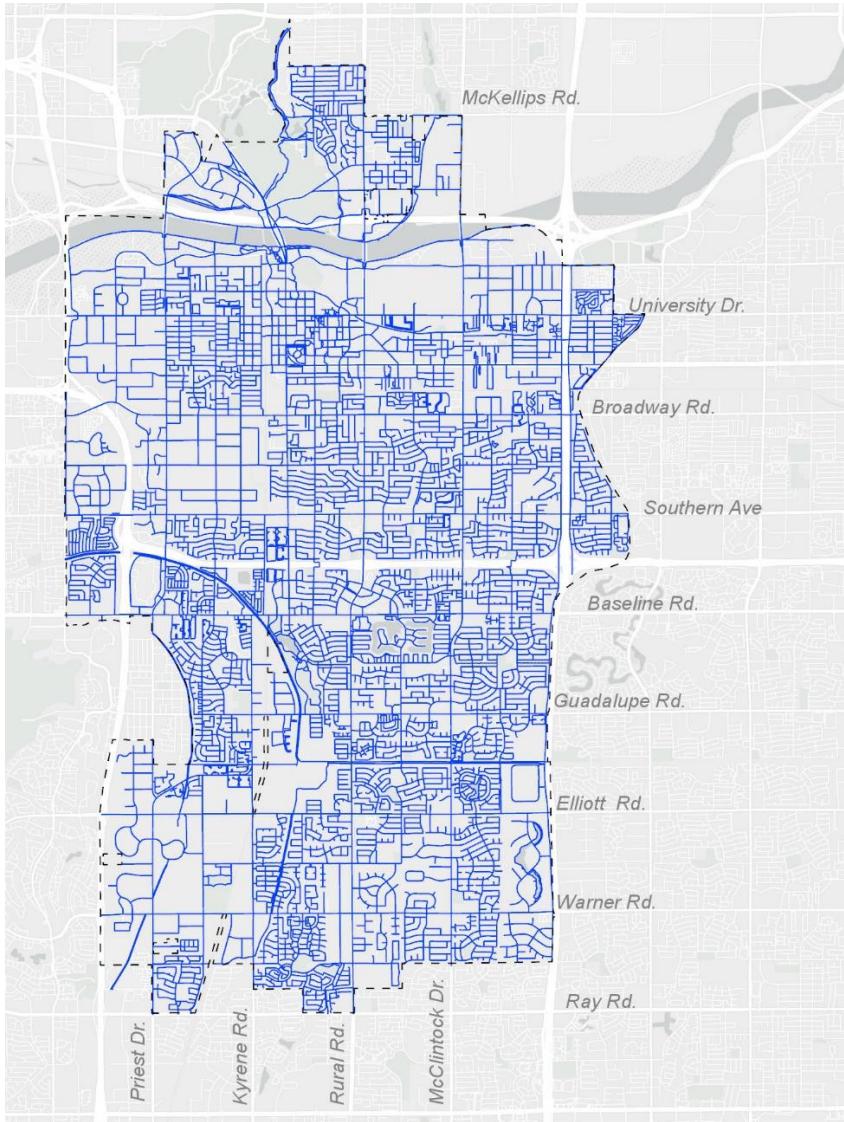


Sidewalk Pedestrian Network

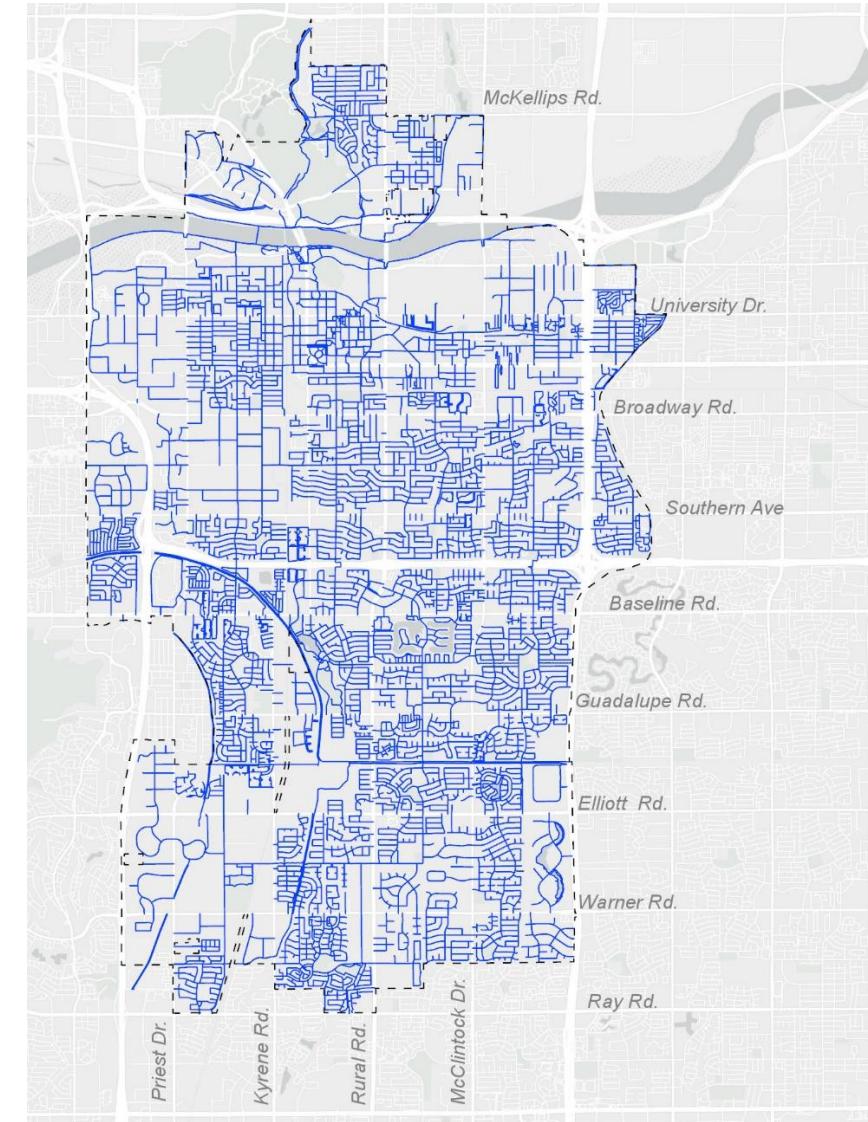


Methodology – Bicycle Networks

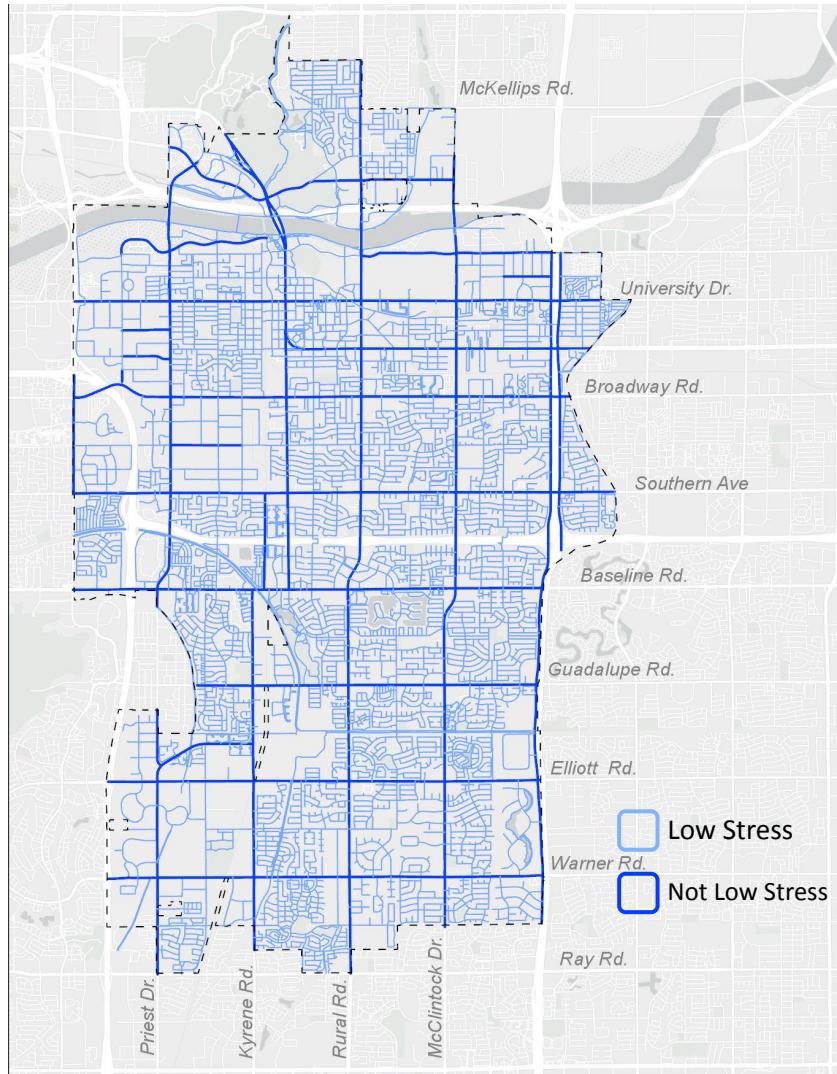
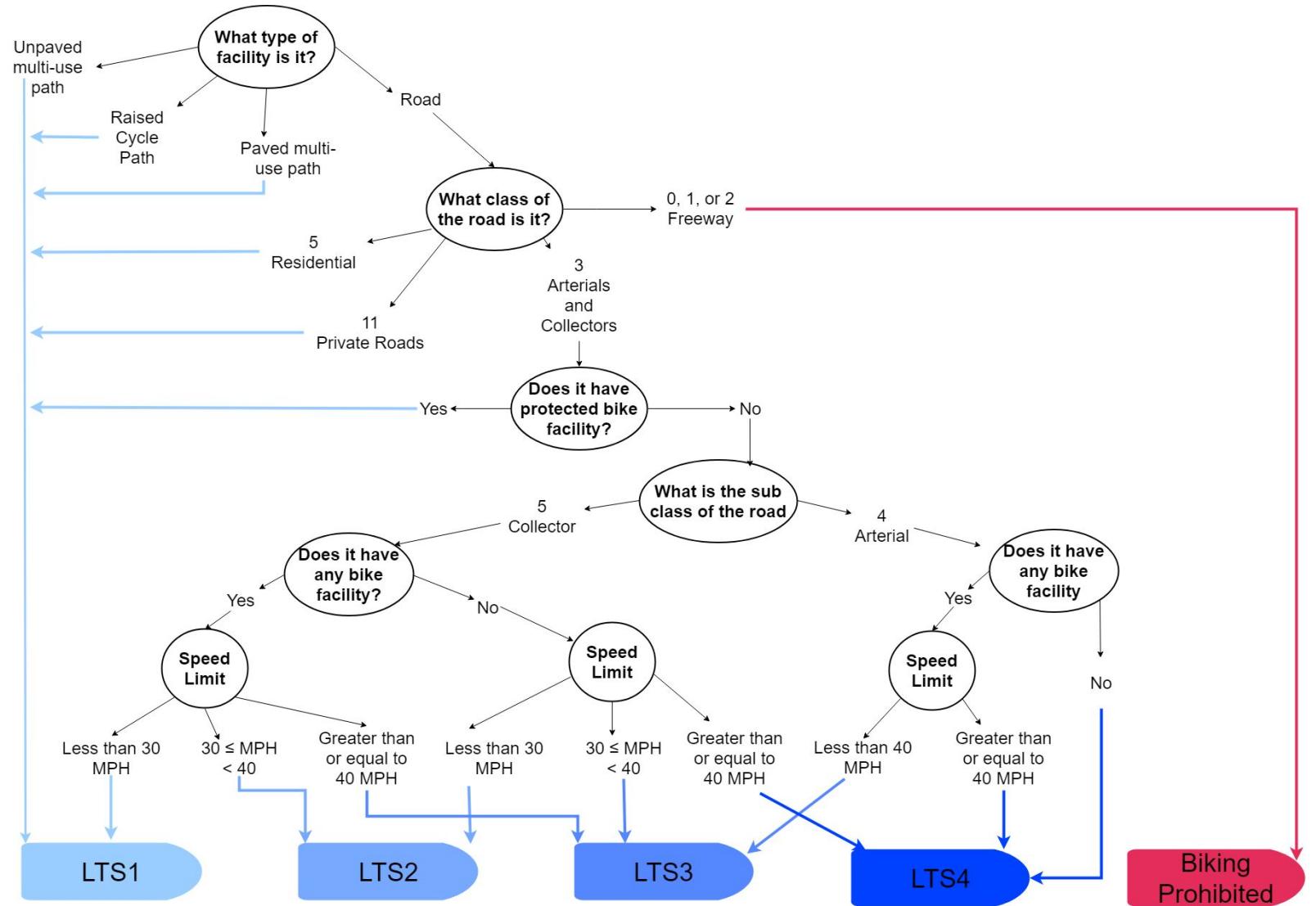
Bicycle Network



Low Stress
Bicycle Network



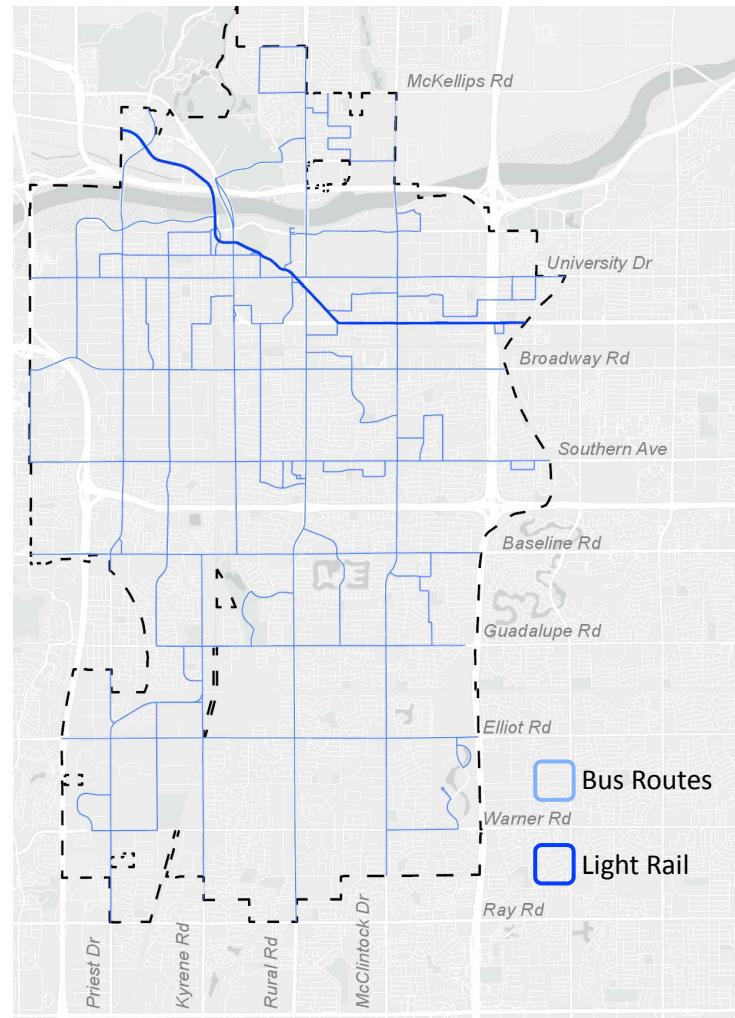
Methodology – Low Stress Bicycle Networks



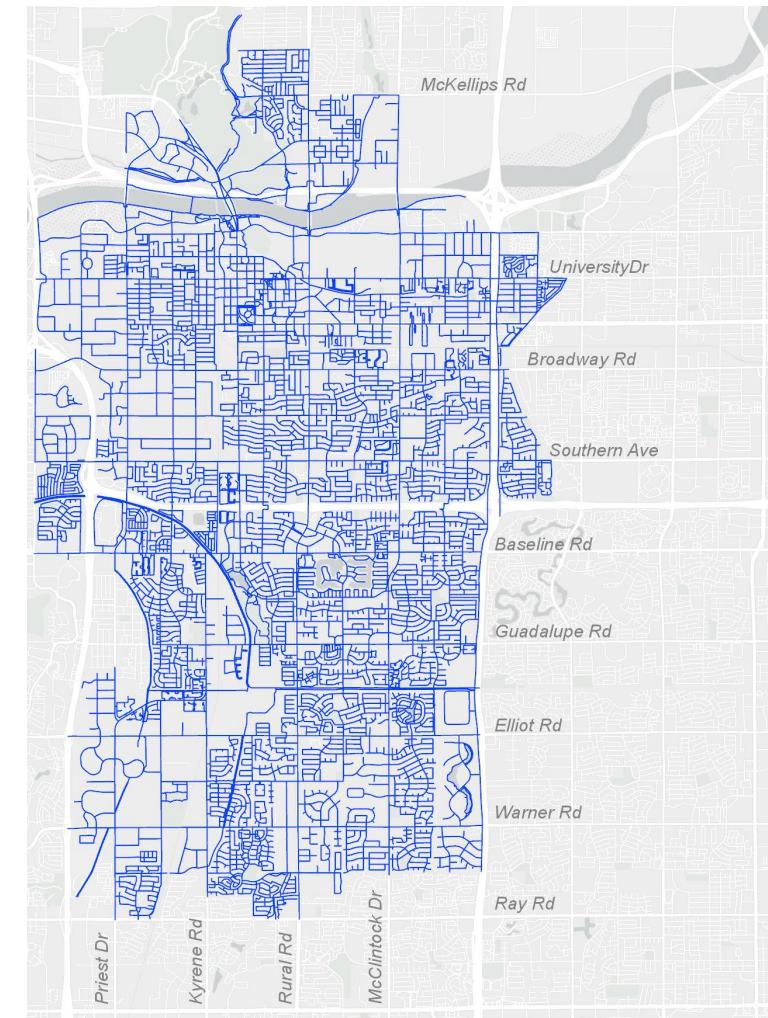
Methodology – Transit Networks

- Transit network was multi-faceted, including a combination of pedestrian and in-vehicle travel time.
 - Bus/light rail stops are within $\frac{1}{4}$ mile of a residential parcel at one end of a trip and within $\frac{1}{4}$ mile of a destination at the other end of a trip.
 - Transfers were not a part of this model.

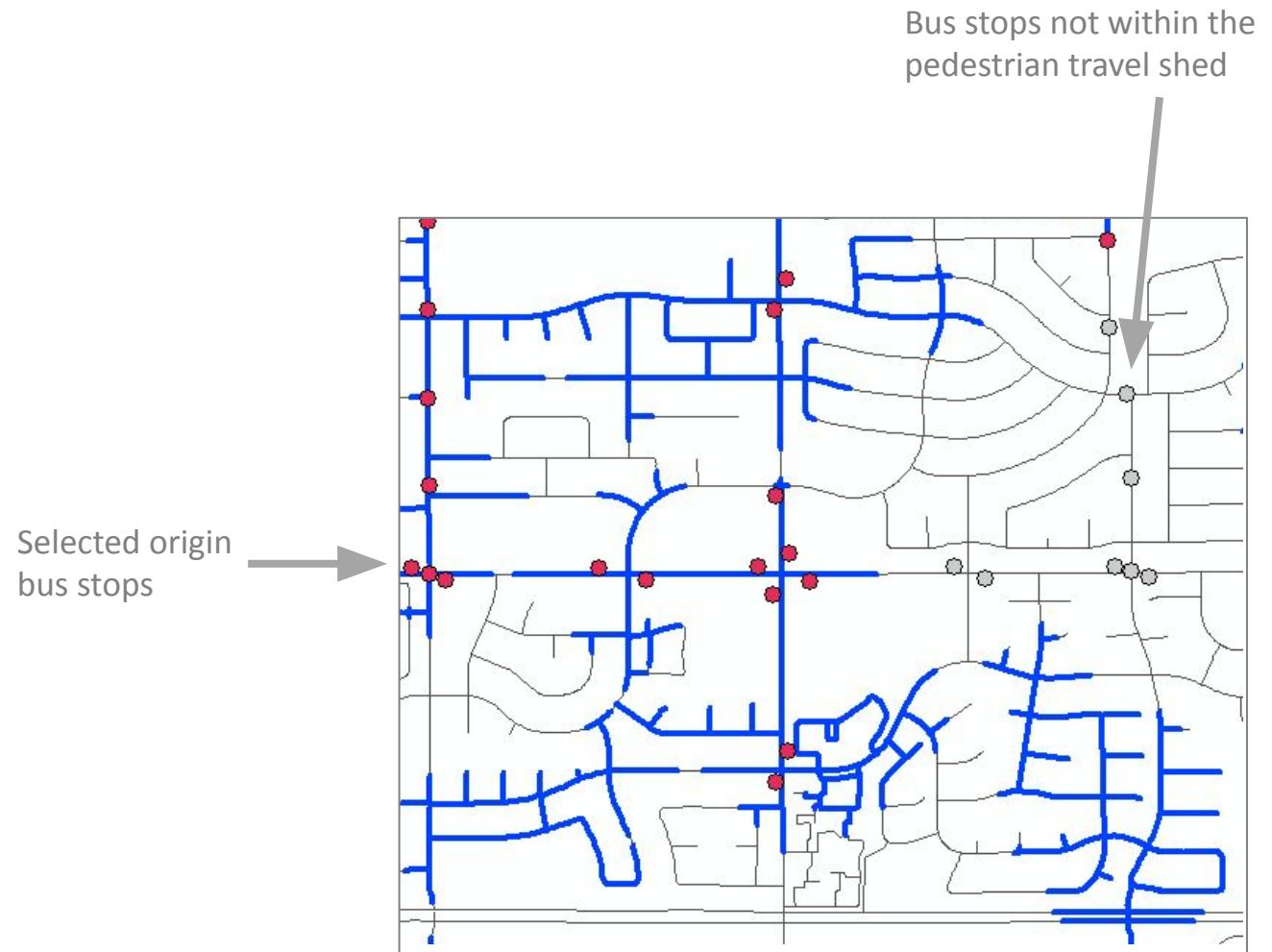
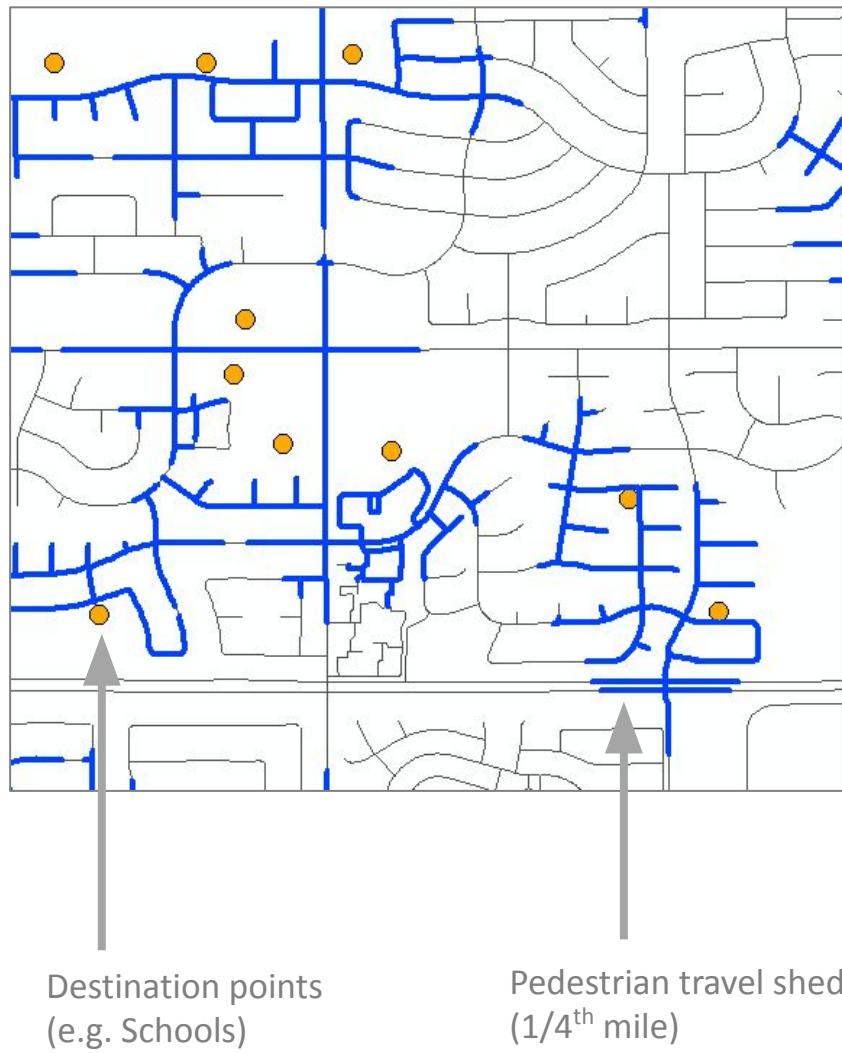
Transit Network – Bus & Light Rail



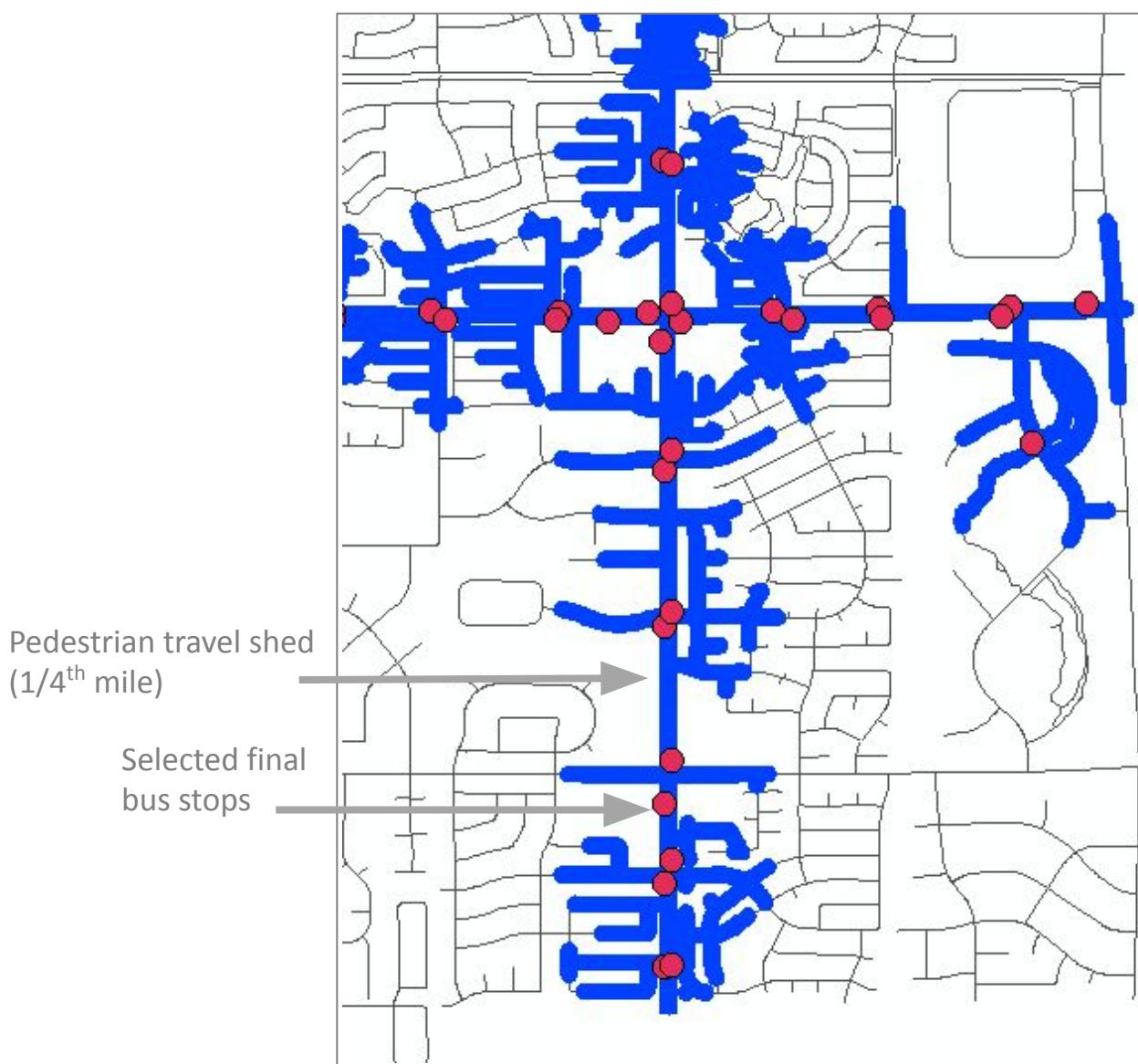
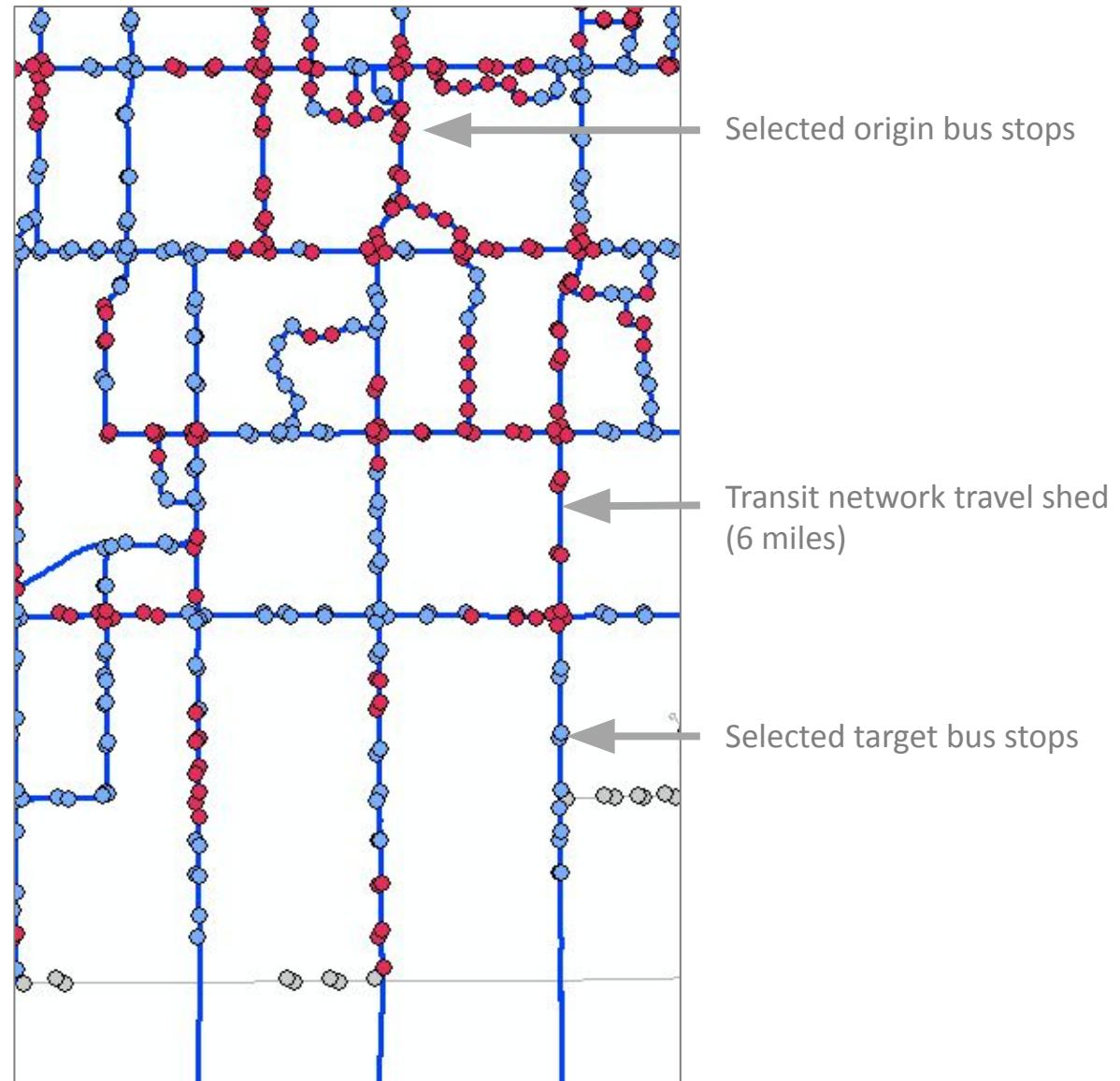
Transit Network – Pedestrian Portion



Methodology – Transit Networks

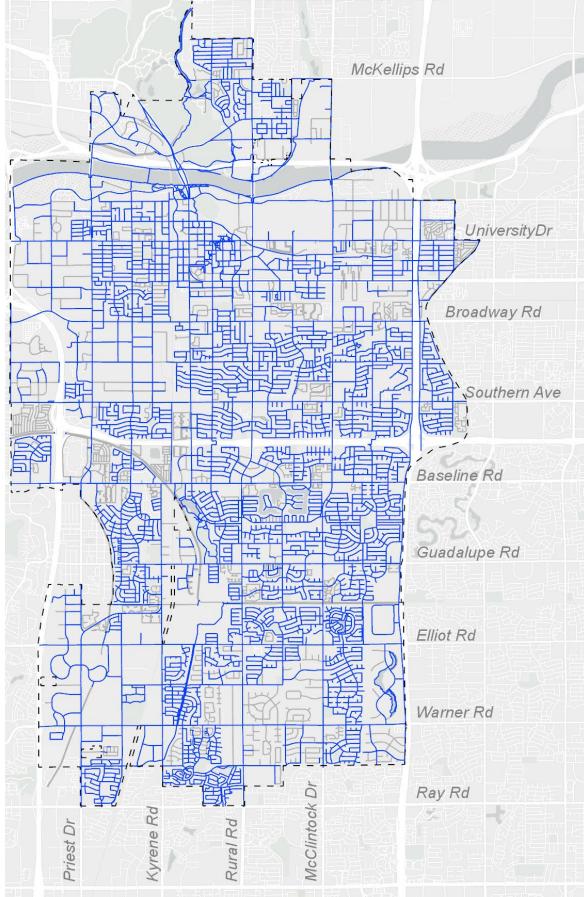


Methodology – Transit Networks

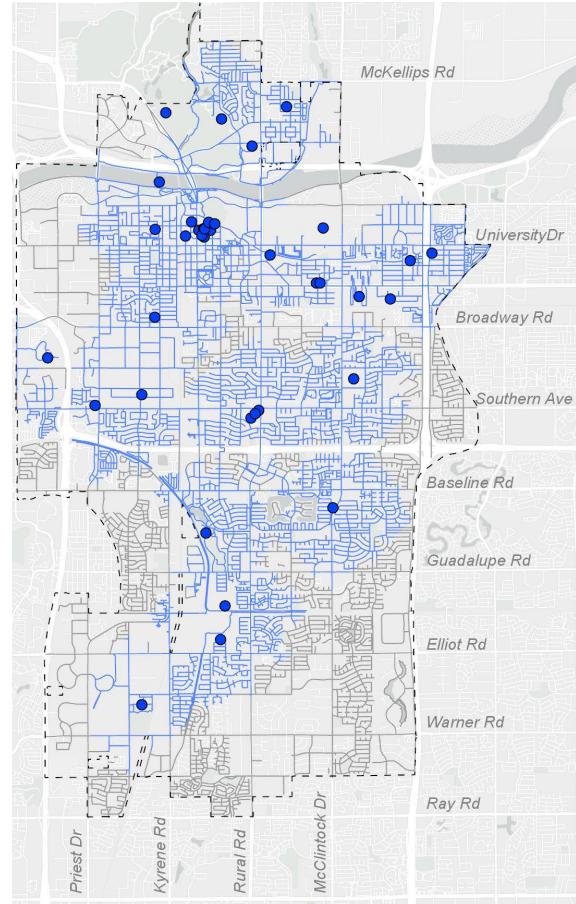


Methodology – Coverage

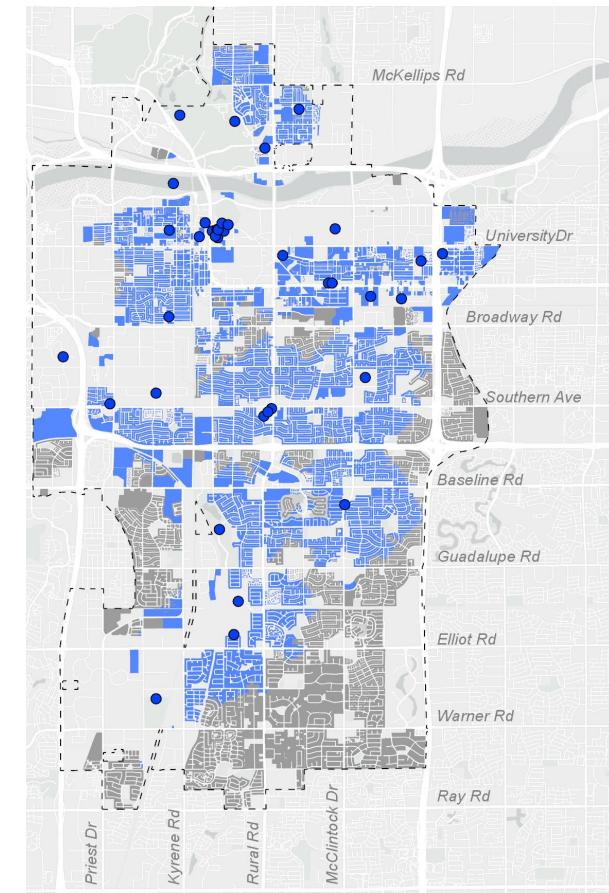
Sidewalk Pedestrian Network



*SW Pedestrian Travel Sheds
for Civic Destinations*



*Parcels within 20 minutes (1 mile)
of Civic Destinations*



Results – All Networks

On average, a high percentage of residential units can reach a variety of destinations.

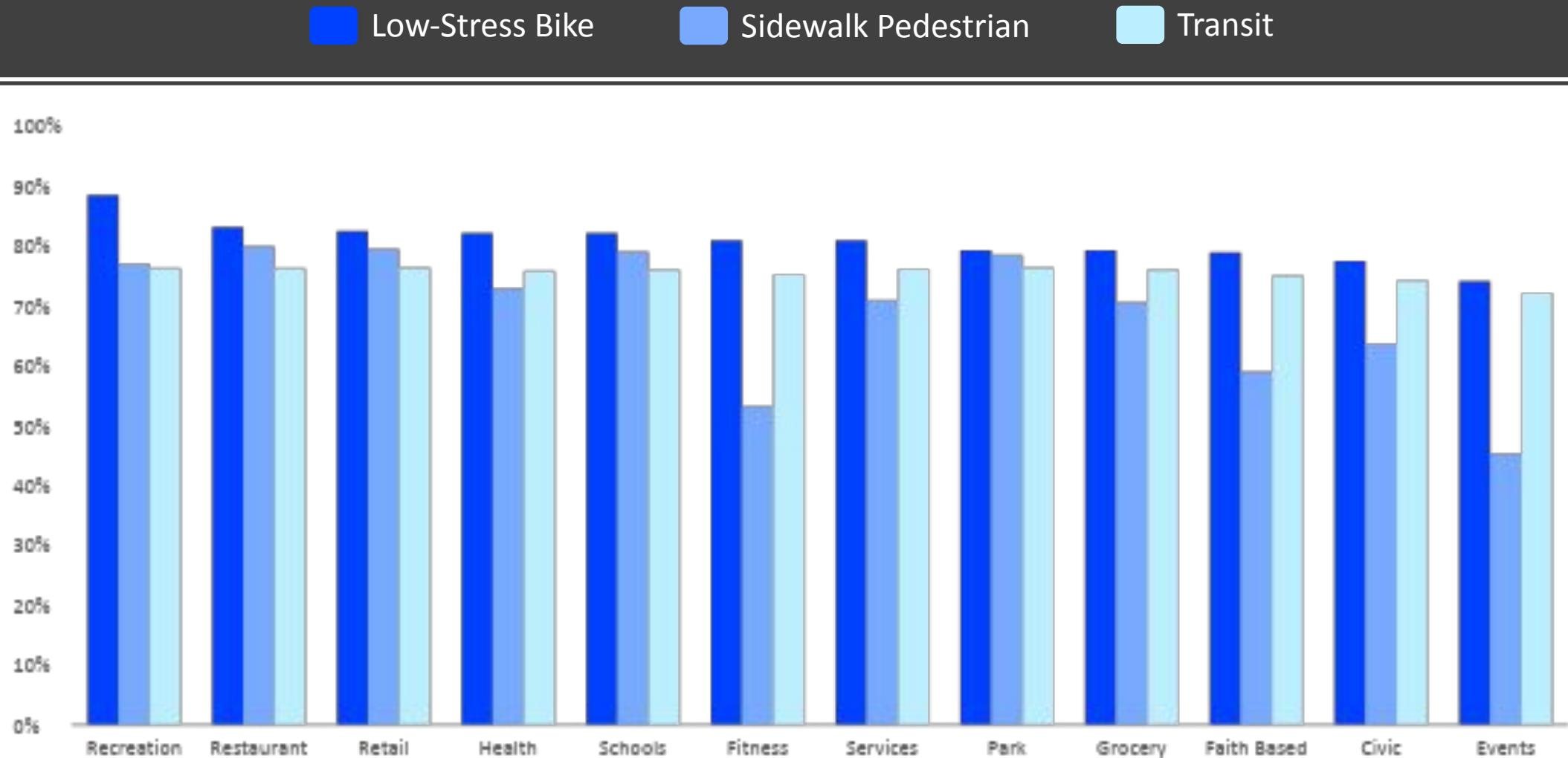
- The best networks are the Bicycle Networks:
 - All-Street Bicycle Network has the best accessibility
 - Low-Stress Bicycle Network has good accessibility
- Both Pedestrian Networks and Transit Network have room for improvement:
 - All-Street Pedestrian Network has fair accessibility
 - Sidewalk Pedestrian Network has fair accessibility
 - Transit has good accessibility

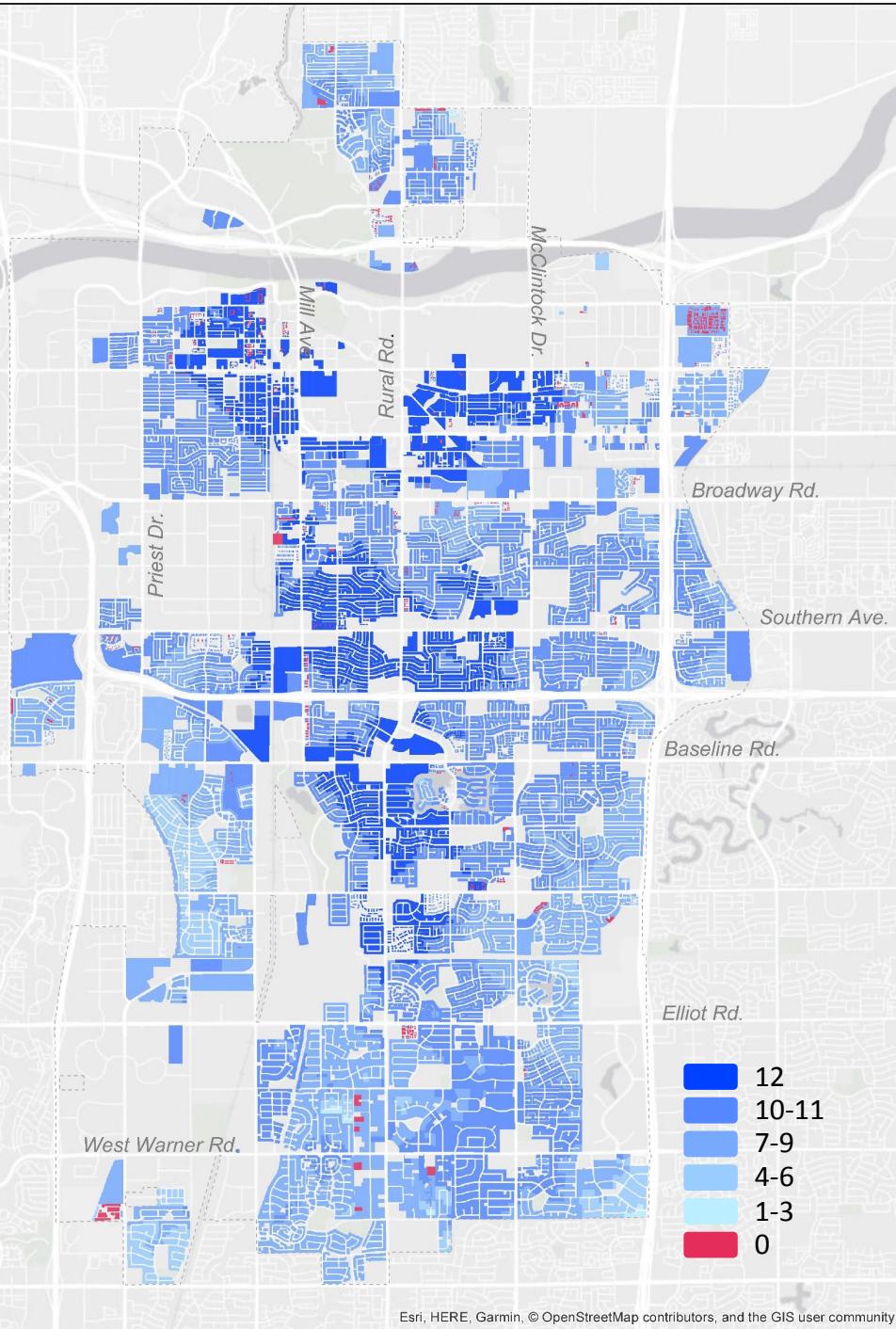
Percent of Residential Units within 20-Minutes of Destinations

98,027 total RUs in Tempe

Destinations	All-Street Bicycle	Low-Stress Bicycle	All-Street Pedestrian	Sidewalk Pedestrian	Transit
Civic	88.5%	77.5%	63.7%	63.7%	74.2%
Events	88.4%	74.1%	50.8%	45.3%	72.1%
Faith Based	88.5%	78.9%	64.4%	59.0%	75.0%
Fitness	88.5%	80.9%	57.4%	53.2%	75.2%
Grocery	88.5%	79.2%	77.6%	70.6%	76.0%
Health	88.5%	82.1%	80.5%	72.9%	75.8%
Park	88.4%	79.3%	87.1%	78.5%	76.4%
Recreation	88.5%	88.5%	85.0%	77.0%	76.3%
Restaurant	88.5%	83.1%	88.5%	79.9%	76.3%
Retail	88.5%	82.5%	87.9%	79.5%	76.4%
Schools	88.5%	82.1%	87.2%	79.0%	76.0%
Services	88.5%	80.9%	78.7%	70.9%	76.1%
Average	88.5%	80.8%	75.7%	69.1%	75.5%

Percent Residential Units per Network



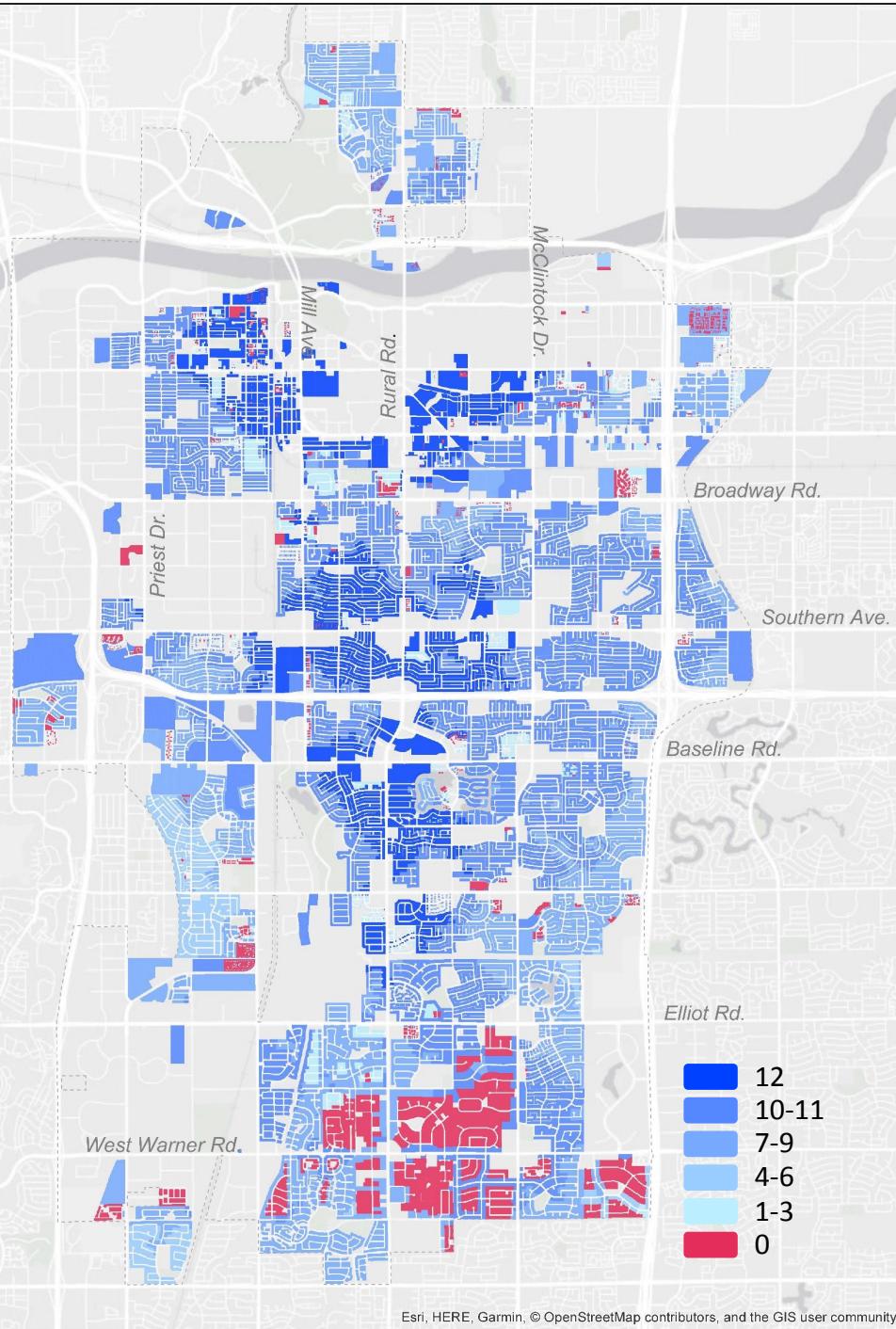


All-Street Pedestrian Network

An average 75.7% of residential units can access a given destination by walking 1 mile or less.

The most commonly accessible destinations include restaurants, retail goods providers, schools, and parks. The least commonly accessible destinations include fitness centers and event spaces.

There are areas of lower access at the southwest and southeast corners of Tempe, and on Kyrene, between Baseline and south of Guadalupe.

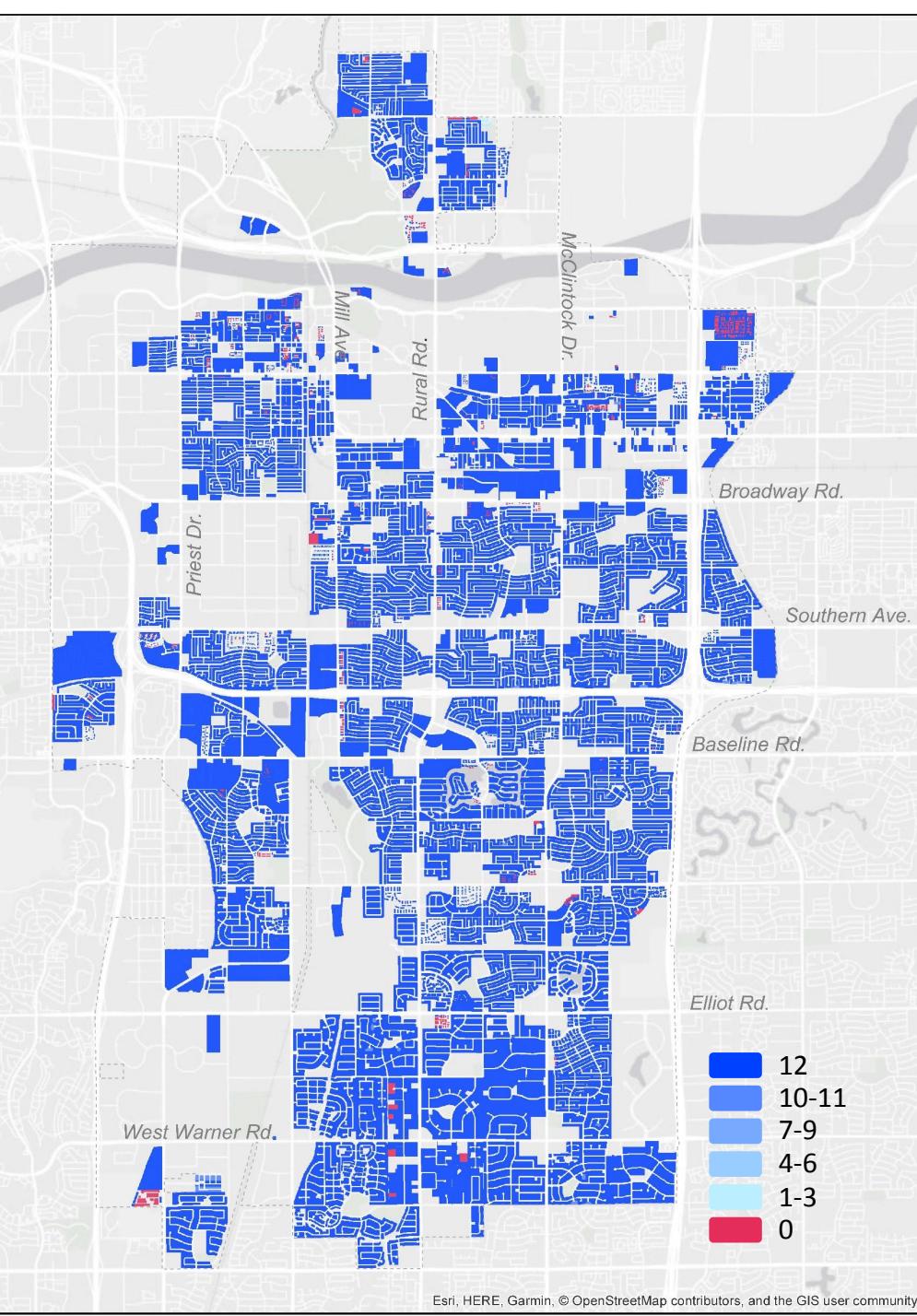


Sidewalk Pedestrian Network

The number of residential units that can be reached when walking on roads with sidewalks and/or paved paths decreases in comparison to all-street pedestrian network from 75.7% to 69.1%.

The most and least commonly accessible destinations are the same as walking on the full pedestrian network.

Large areas in south Tempe lose access due to private roads and sidewalks, as do smaller areas throughout the city.

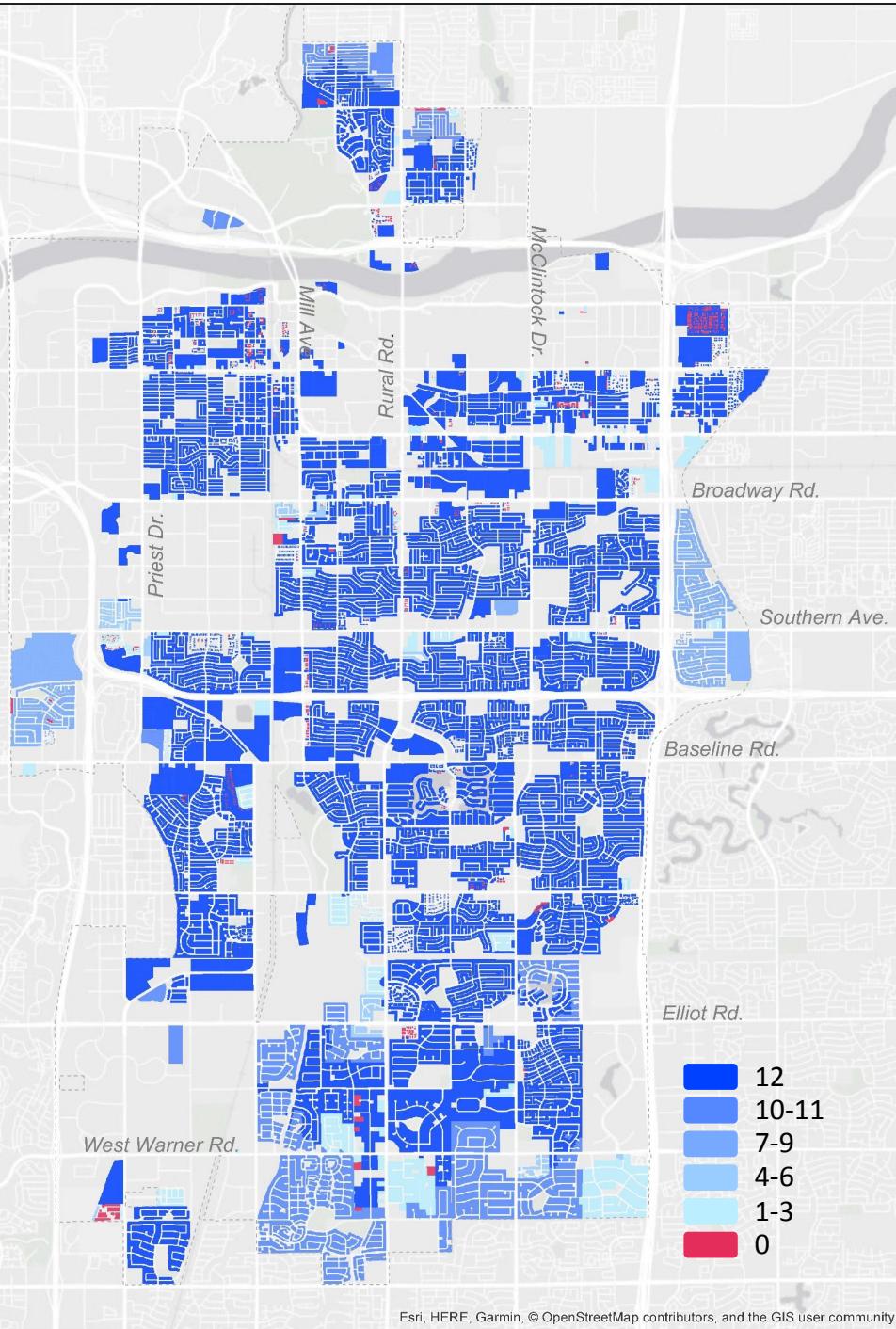


All-Street Bicycle Network

88% of residential units can access a given destination by biking 4 miles or less.

Issues:

- Multi-family complexes with large footprints.
 - 98.5% area coverage vs. 88.5% unit coverage.



Low-Stress Bicycle Network

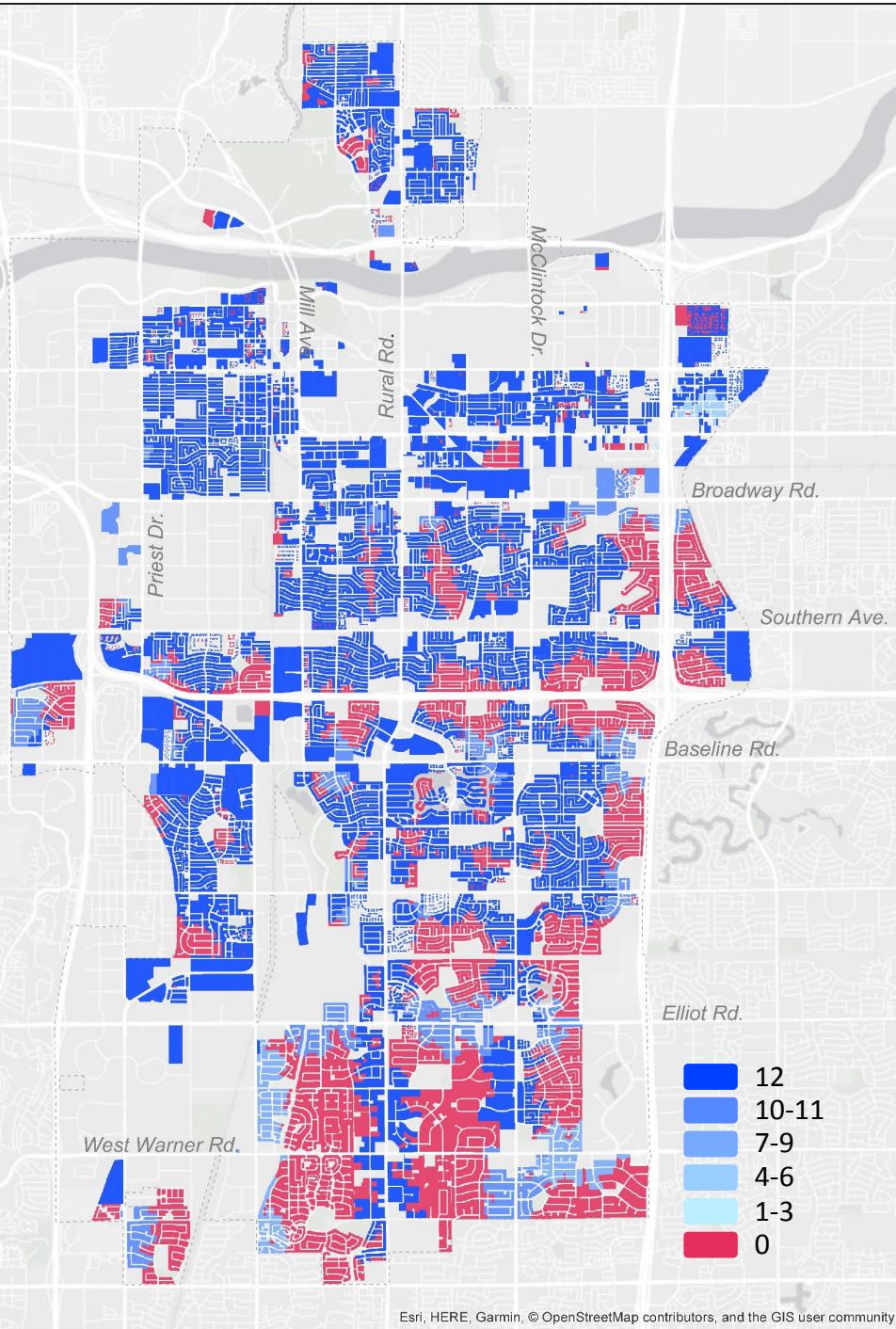
An average 80.8% of residential units can access a given destination by biking 4 miles or less on a low stress surface. There is a much higher variability in the type of destination that is accessible than there is when people can bike on any surface.

Issues:

- Neighborhoods cut off by freeways.
- Many neighborhoods and apartment complexes have only one outlet onto a high stress street.

Recommendations:

- Protected bike lanes across freeways and arterial with high amounts of apartment complexes.



Transit Network

An average of 75.5% of residential units can access a given destination. Transit allows the second lowest level of accessibility of all the five networks analyzed, after only the sidewalks network.

Issues:

- Areas where the transit routes are not available, such as Warner road, away from Rural road do not allow residents to use transit.
- Parcels in the middle of larger blocks may not have access to transit available on arterials.

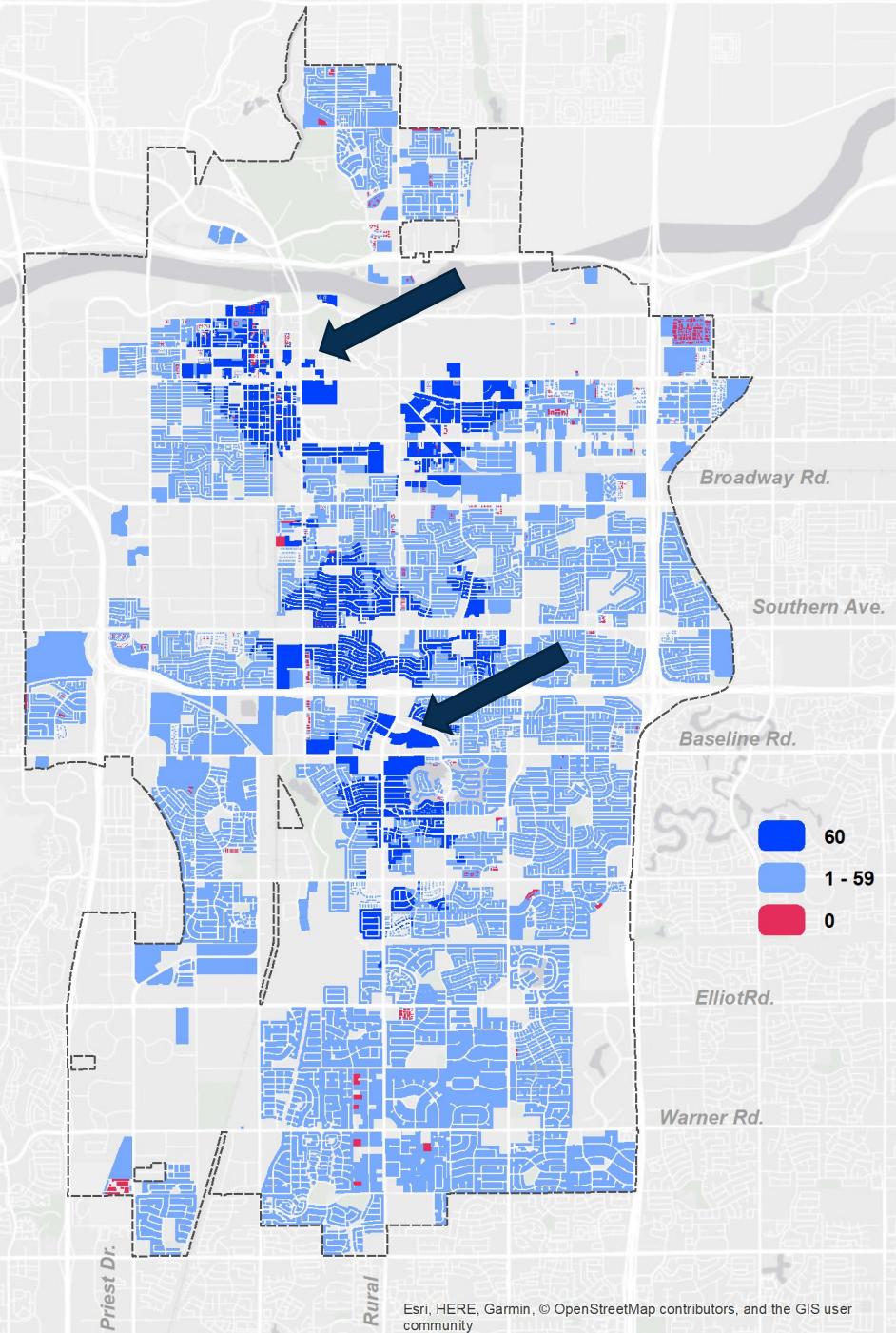
Recommendations:

- Expand circulators.
- First and last mile options.

Accessibility Considerations and Future Research

Based on analysis Mill Avenue and Baseline/Rural are equally accessible. But there are differences to measure.

- Quality of walking/biking environment
- Street facing doors
- Corner entrances
- Clear paths through parking lots
- Bike racks
- Shade for sidewalks
- Protection from street
- Access through walls
- Signal timing





Thank
you!