

Taking Steps Towards Measuring the Pedestrian Environment



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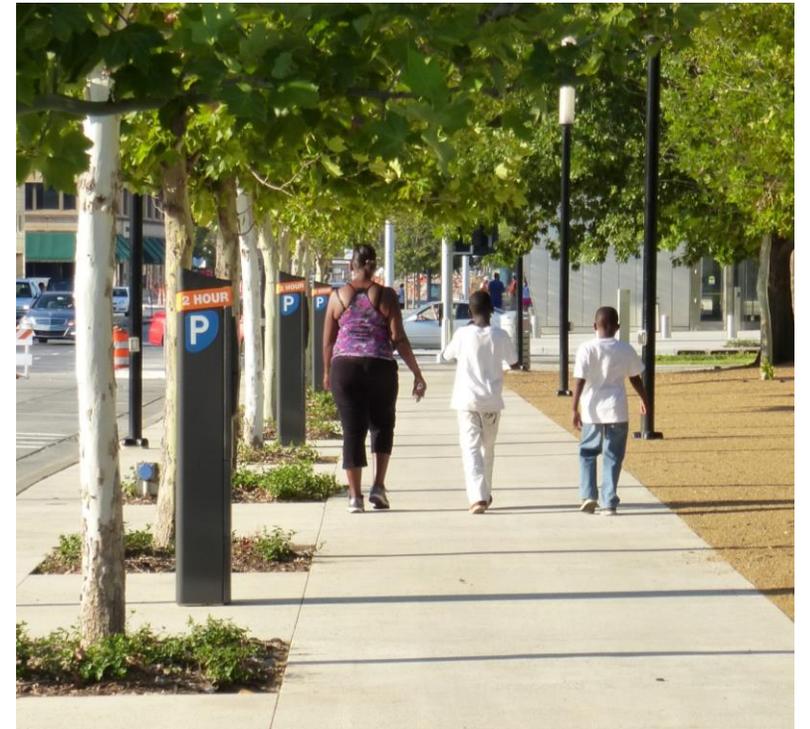
Association of Pedestrian and Bicycle Professionals
National Conference, August 26, 2019

Agenda

9:45 – 10:00	Introductions and background
10:00 – 10:45	Three tools for measuring the pedestrian environment
10:45 – 11:40	Applying the tools in the field
11:40 – 12:15	Reporting and feedback

Why Measure the Pedestrian Environment?

- Understand existing conditions and barriers to walking
- Determine where improvements are needed
- Prioritize improvements
- Program projects/seek funding



What Makes a Good Pedestrian Environment?

- Infrastructure
 - Sidewalks/separate space
 - Buffers from traffic
 - Curb ramps
 - Safe crossings
 - Lighting
- Urban Form and Architecture
 - Short blocks/connectivity
 - Enclosure
 - Transparency
 - Active uses
 - Amenities/art
 - Few driveways

Highway Capacity Manual Pedestrian Level of Service (LoS)

- Quantitative method of measuring service and capacity of walking facilities
- Factors: Space, walking speeds, crosswalk walking speeds, start-up times, grade and stairs walking speeds, capacity thresholds, delay at unsignalized crossings
- Application: Formulaic “grade” (A-F) applied to segments and intersections

Table 3: Data required to calculate PLOS for a signalized intersection.

Pedestrian Environmental Quality Index (PEQI)

- Planning-oriented observational tool
- Factors: Intersection quality, street quality, land use, perceived safety factors, objective and subjective
- Application: Pedestrian facilities audit form as checklist, accessible to general population

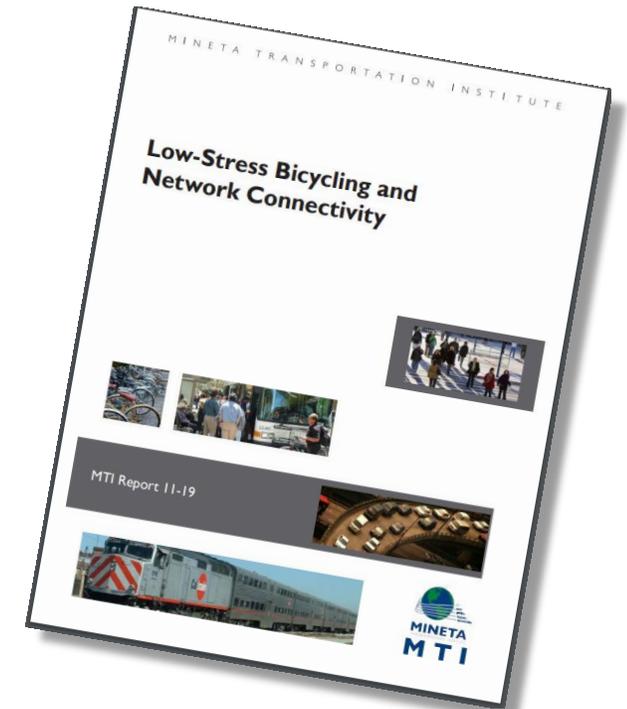
The image shows a detailed audit form for the Pedestrian Environmental Quality Index (PEQI). The form is titled "Pedestrian Environmental Quality Index (PEQI) Street & Intersection Audit Form" and includes fields for "Project", "Auditor(s)", "Survey Date", and "Date entered into database". It is divided into two main sections: "INTERSECTION" and "STREET SEGMENT".

The "INTERSECTION" section includes questions about the intersection type, crosswalks, high visibility crosswalks, intersection lighting, traffic control, and pedestrian refuge islands. The "STREET SEGMENT" section includes questions about the number of lanes, posted speed limit, and street traffic calming features.

The form is part of a "Pedestrian Environmental Quality Index Training Manual".

Level of Traffic Stress (LTS)

- Assessment of stress levels a bicyclist experiences while traveling;
- Factors: Perceived safety issues, extended travel distance, difficult terrain, network disconnectivity
- Application: As a scale on segments, intersections, and crossings
 - LTS 1: Low stress; suitable for children
 - LTS 2: Tolerable for general adult population
 - LTS 3: Tolerable for “enthused and confident” bicyclists
 - LTS 4: Tolerable by “strong and fearless” bicyclists; high level of stress



Pedestrian Index of the Environment

- Area-based measure for estimating the probability that a trip within a defined geographic zone will be made by walking
- Factors: Block size, access to parks and transit, pop.density, sidewalk density, comfortable facilities, ped-friendly businesses
- Application: travel demand forecasting, standalone pedestrian planning tool

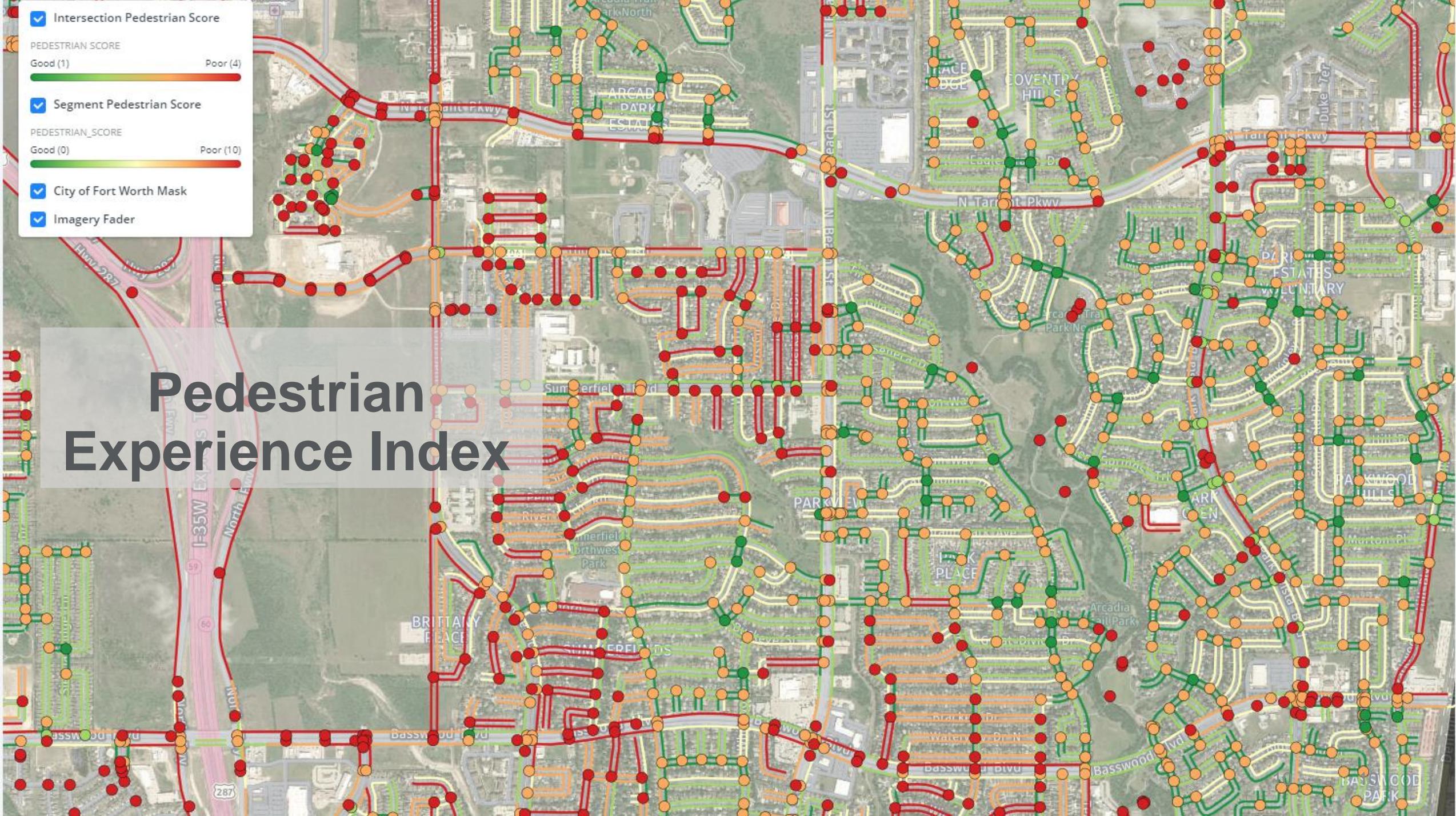


Pedestrian Experience Index

APBP Conference 2019
Michael Hintze, AICP

- Intersection Pedestrian Score
- PEDESTRIAN SCORE
- Good (1) Poor (4)
-
- Segment Pedestrian Score
- PEDESTRIAN_SCORE
- Good (0) Poor (10)
-
- City of Fort Worth Mask
- Imagery Fader

Pedestrian Experience Index



Questions We Tried to Answer

- What makes a good place to walk?
- How is it different from bicycling?
- Can it be measured on a citywide scale?
 - What data are available?
 - How do you score the available data?
- Should walkability be measured differently in urban, suburban, and rural contexts?

What can be measured?

Roadway Infrastructure

- Sidewalk Presence
- Sidewalk Quality
- Posted Traffic Speeds
- Traffic Lanes
- Adjacent Parking
- Adjacent Bike Lanes

Built Form

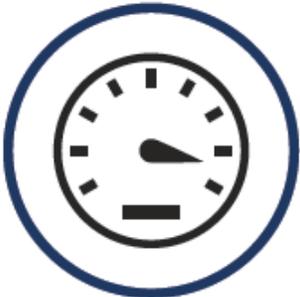
- Block Length
- Mid-Block Crossing
- Building Setbacks
- Driveways
- Number of Addresses per Block

Other things that could be measured (if you had the data)

- Tree canopy
- Transparency (windows/storefronts)
- Sidewalk width **or condition**
- Sidewalk buffer
- Street lighting data

Segments – Roadway Infrastructure



					
Infrastructure	Sidewalk Presence & Condition	Posted Speed Limit	Number of Lanes	Bike Lane Presence	Car Parking Presence
Effect	Existing and in good condition = more comfortable	Lower = more comfortable	Fewer = more comfortable	Present = more comfortable	Present = more comfortable

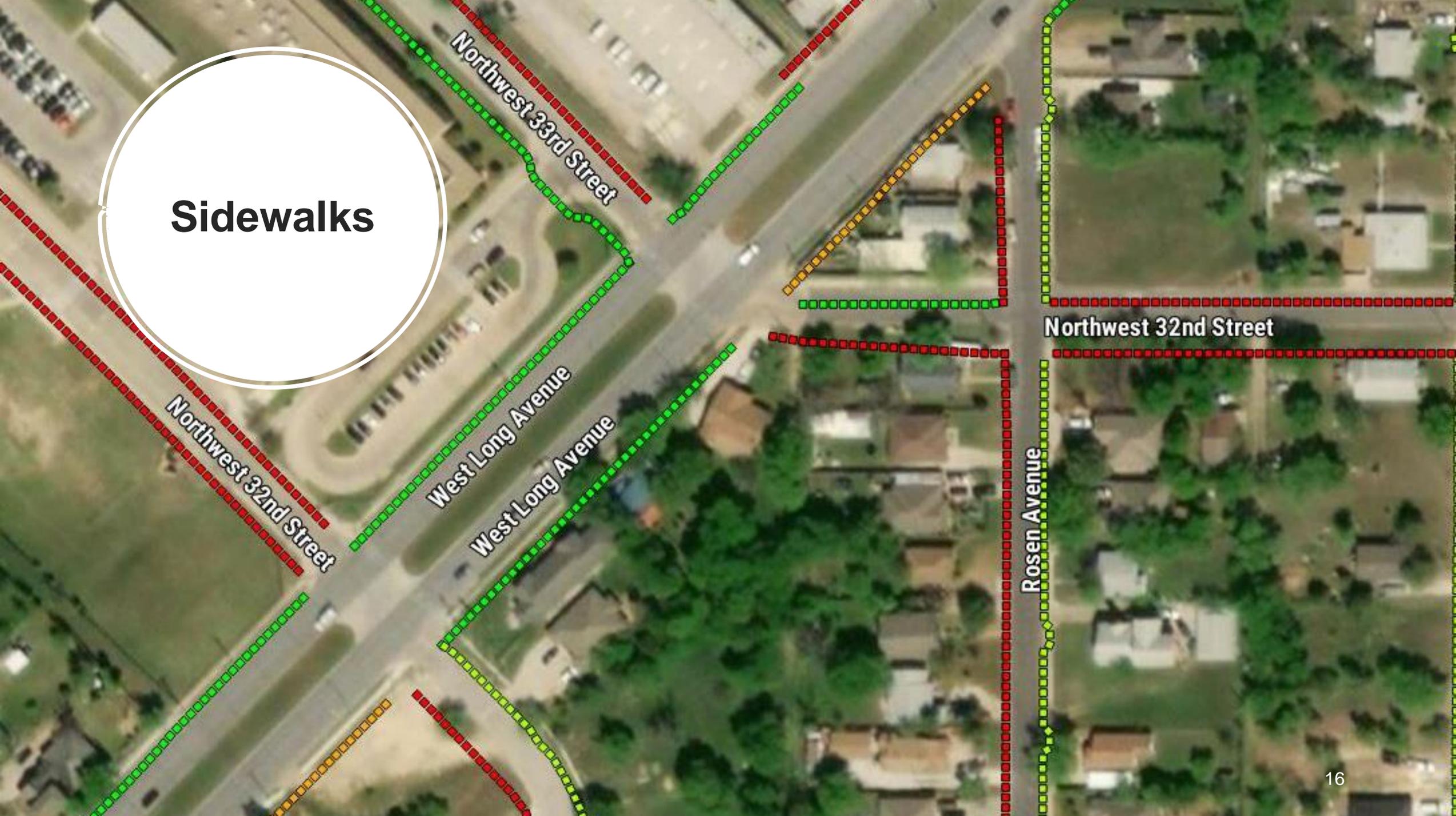
Segment Scoring – Roadway Infrastructure

Maximum Points

Built Form (Dense and Not Dense)

- Sidewalk Presence & Condition – **30**
- Posted Speed Limit – **25**
- Number of Lanes – **25**
- Bike Lane Presence – **5**
- Car Parking Presence – **5**

Sidewalks



Northwest 33rd Street

Northwest 32nd Street

Northwest 32nd Street

West Long Avenue

West Long Avenue

Rosen Avenue

**Bike Lane
Presence**

amp Bowie Boulevard

University Drive

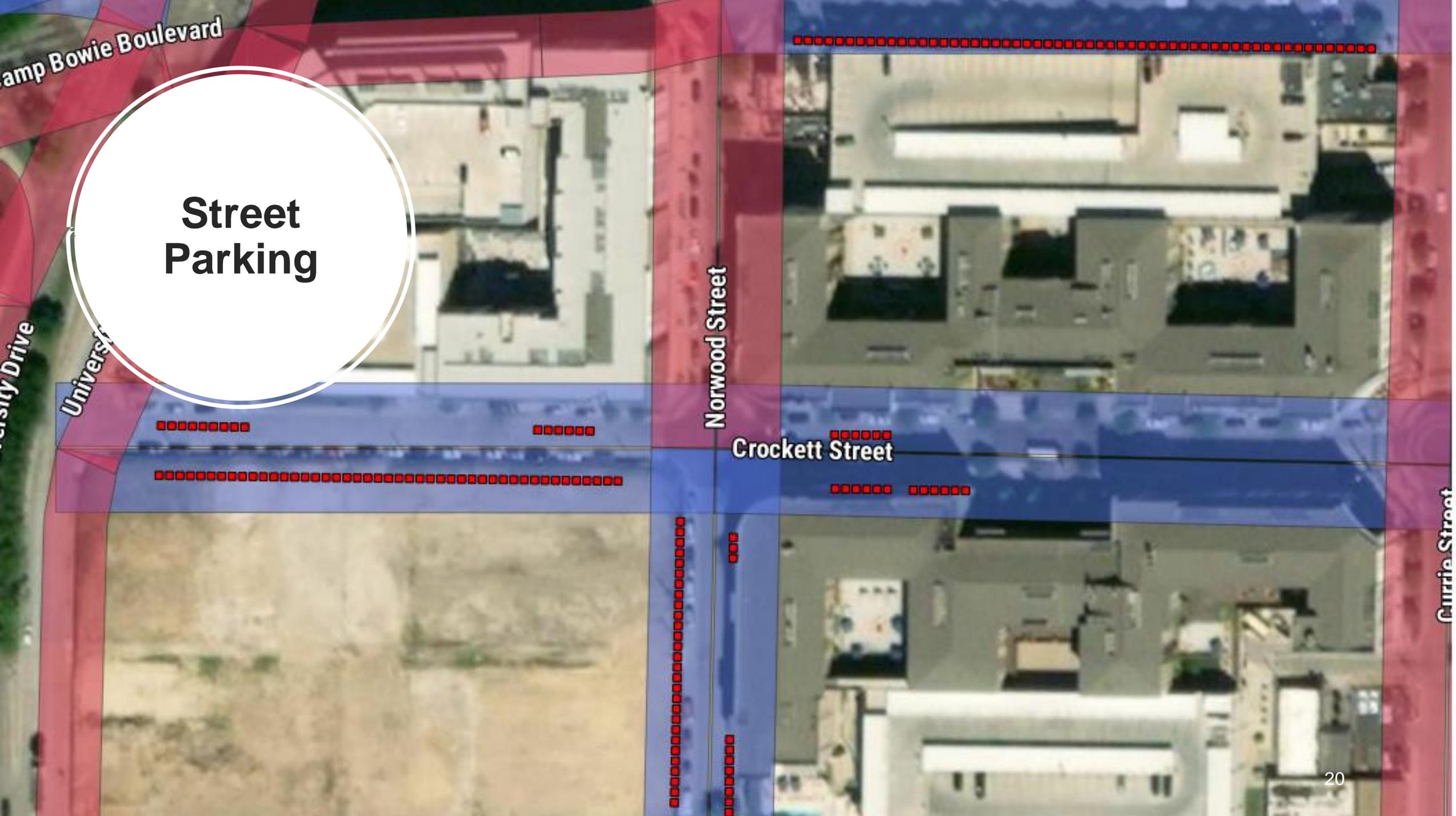
University

Street Parking

Norwood Street

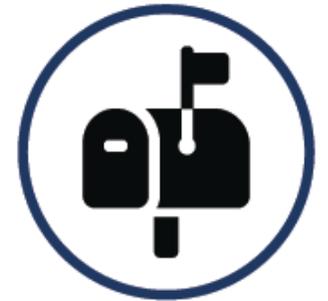
Crockett Street

Currie Street



Segments – Built Form

Built Form	Block Length	Building Set Back	Driveways	Addresses per Block
Effect	Shorter = preferable	Closer to the sidewalk = more comfortable	Fewer = more comfortable	More = preferable

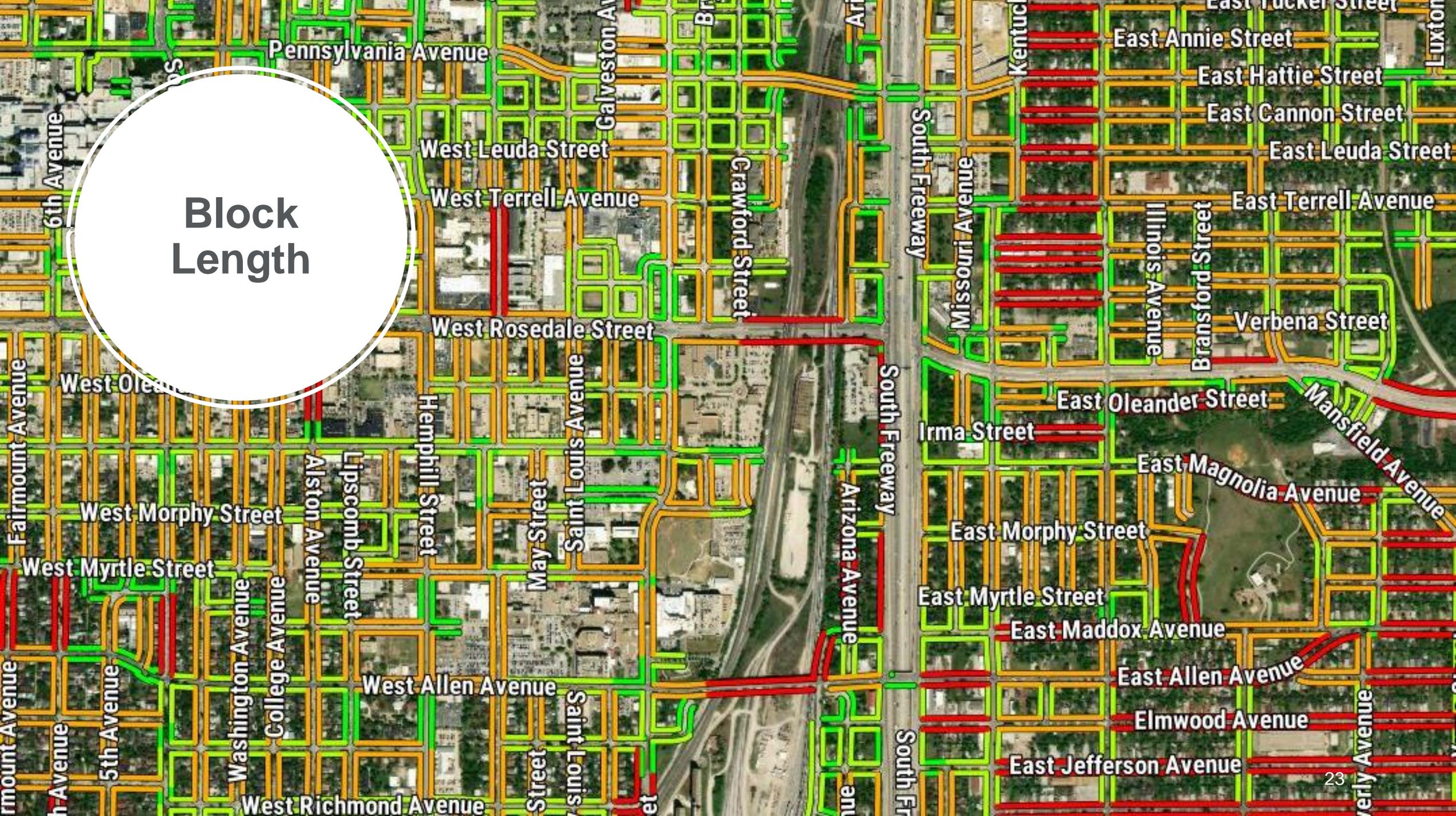


Segment Scoring – Built Form

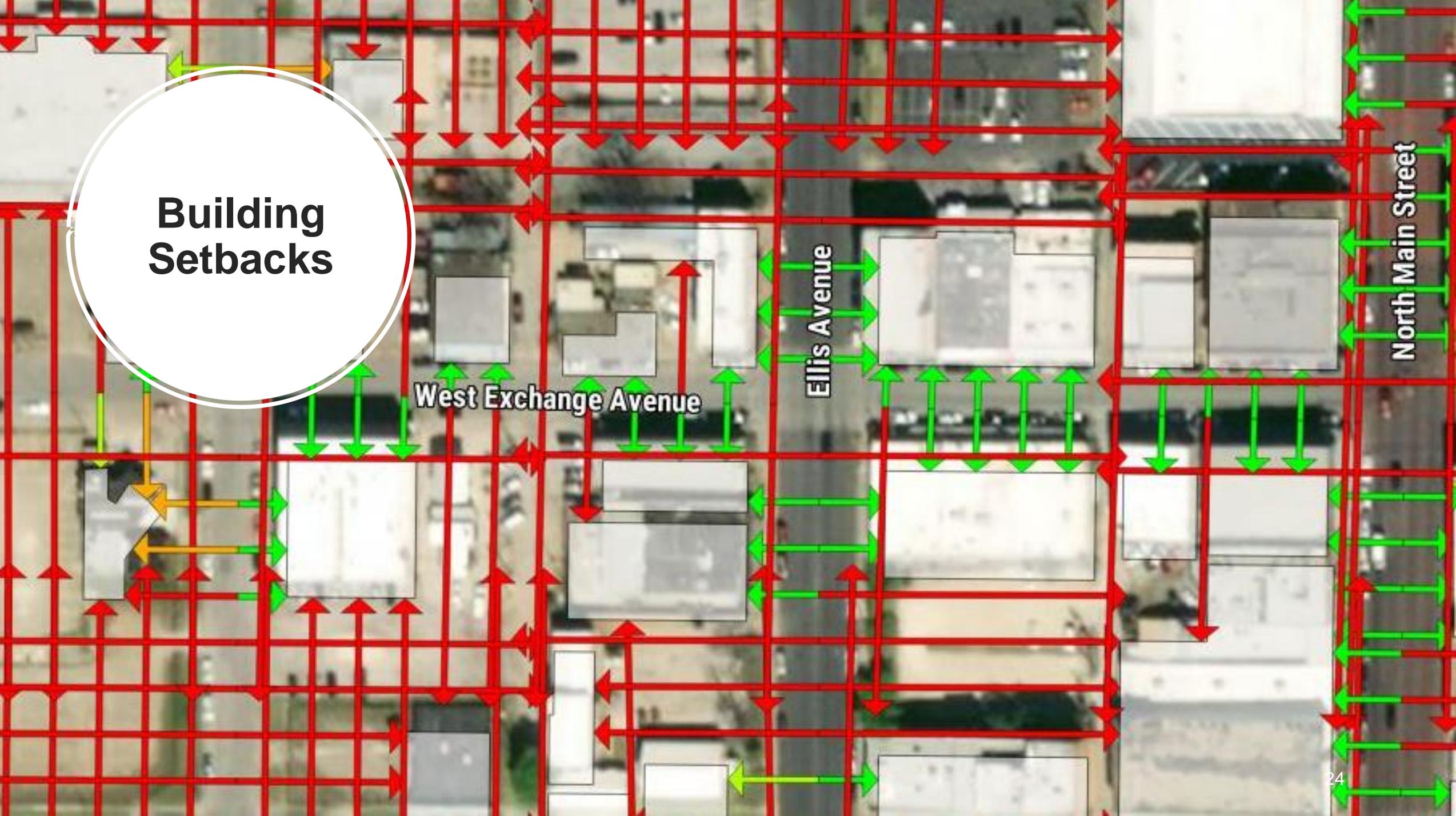
Built Form (Dense)

- Block Length – **40**
- Building Set Back – **50**
- Driveways – **20**
- Addresses per block – **20**

Block Length



Building Setbacks



West Exchange Avenue

Ellis Avenue

North Main Street

Driveways



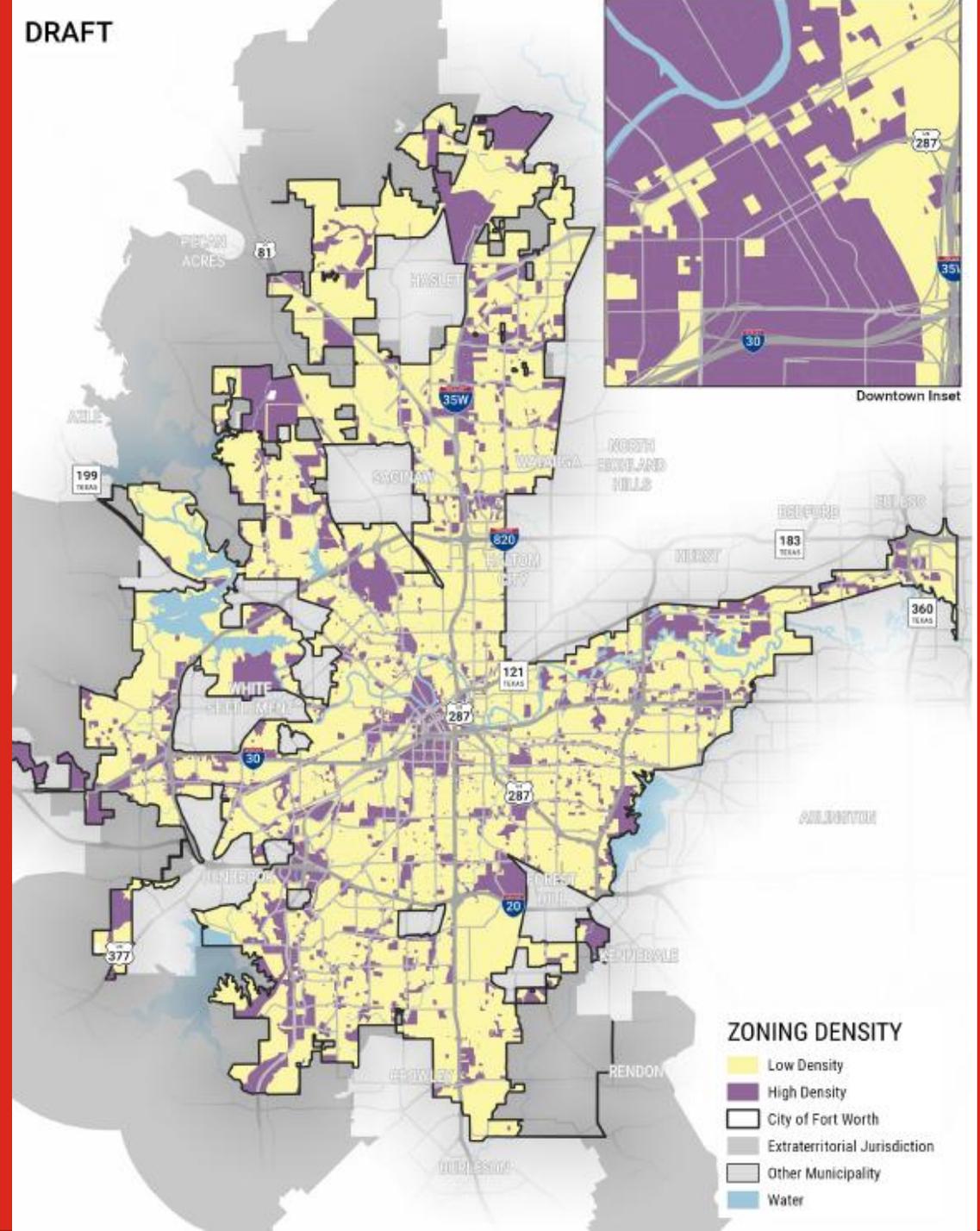
**Number of
Addresses
Per Block**



Zoning Categories

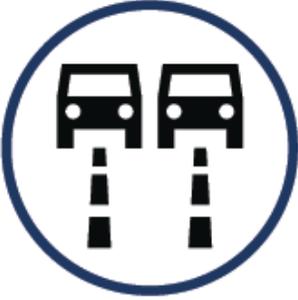
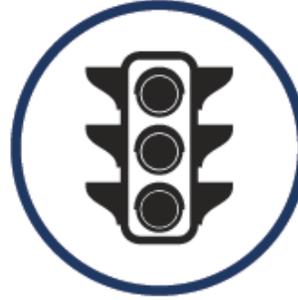
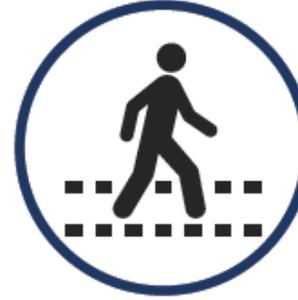
For zoning categories that are considered “high density” (purple), we use the infrastructure and built form measures.

For low density land use areas (yellow), we score using only the infrastructure categories.

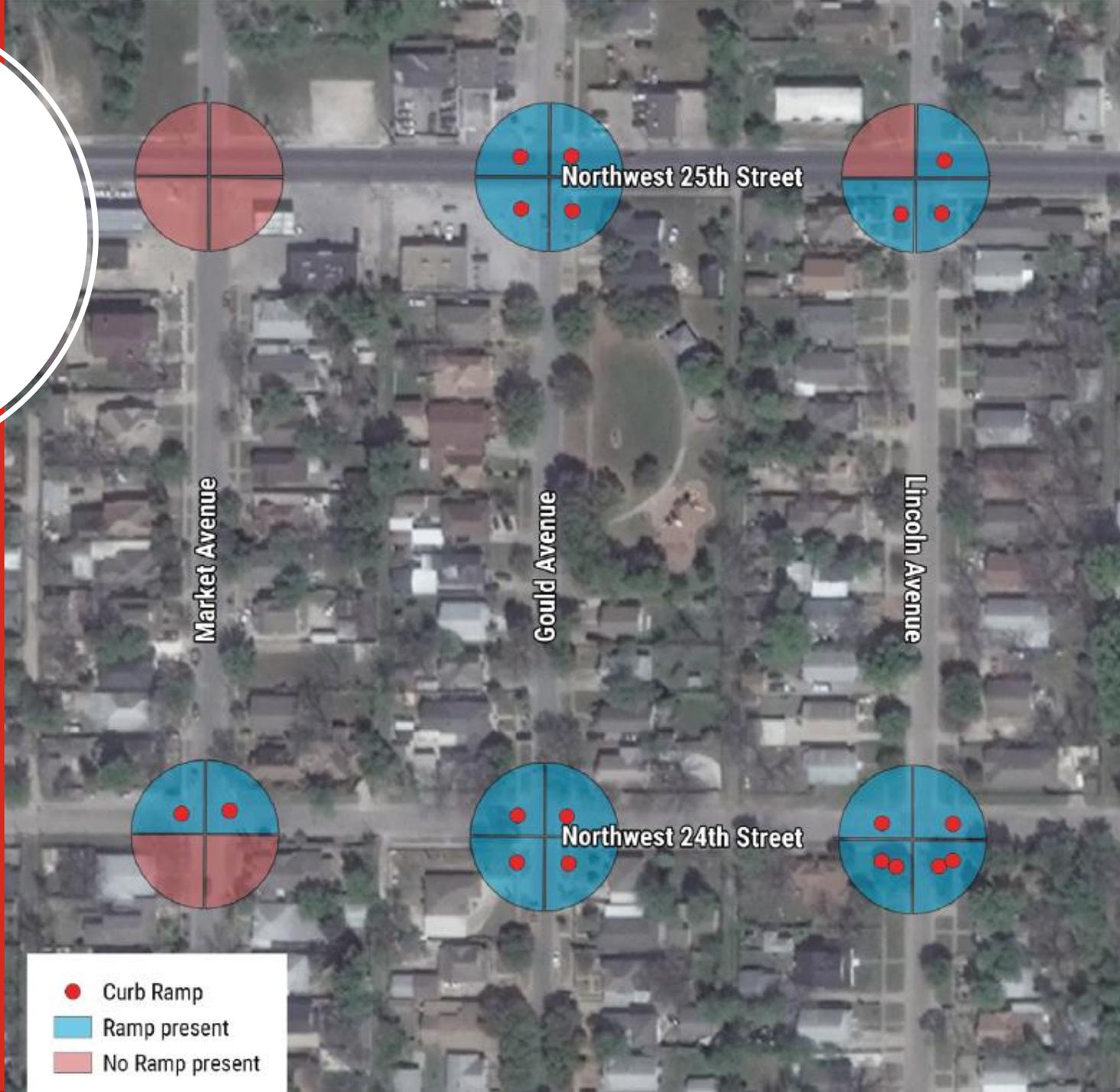


Intersections



					
Intersection	Number of Lanes	Posted Speed Limit	Accessible Curb Ramps	Traffic Signals	Crosswalks
Effect	Fewer = more comfortable	Lower = more comfortable	More = more comfortable	Present = more comfortable	Present = more comfortable

ADA Ramps



- Curb Ramp
- Ramp present
- No Ramp present

Intersection Scoring

Scored on 1 - 4

- Number of Lanes: **1:** 2 lanes **4:** ≥ 5 lanes
- Posted Speed Limit: **1:** 30mph **4:** ≥ 40 mph
- ADA Curb Ramps: **1:** 4 corners **4:** 0 ramps

Score Improved By:

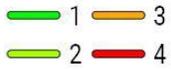
- Traffic Signal
- Crosswalk across major road

Example: Magnolia Avenue

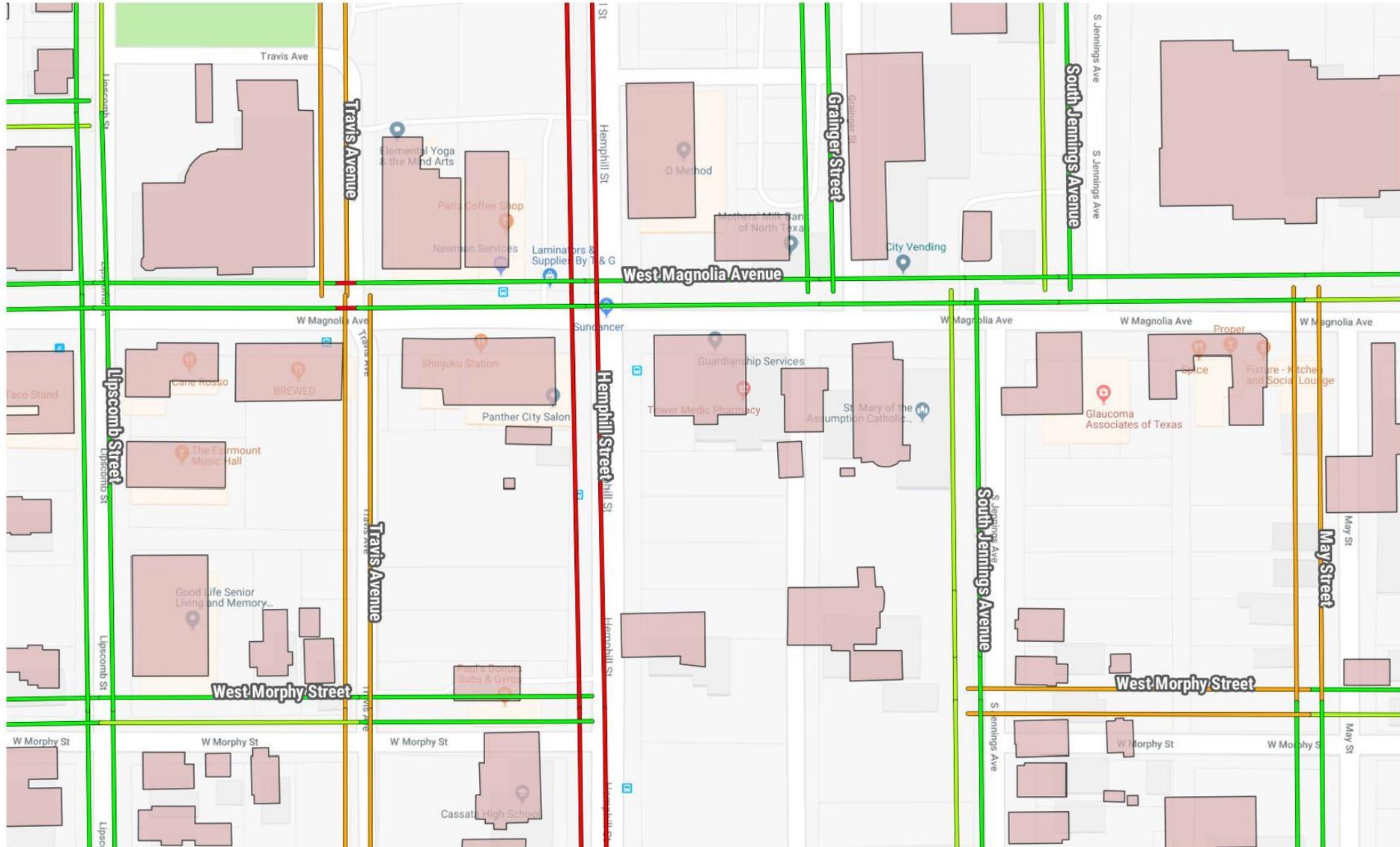




Pedestrian Experience Index (Quartiles)



Example:
West
Magnolia
Avenue



1 = Positive
Experience

4 = Negative
Experience



Example: West 7th Street

- Traffic Speed
- Lanes
- Block Length
- No Parking
- Driveways
- Building Setbacks
- Sidewalks
- Bike Lane



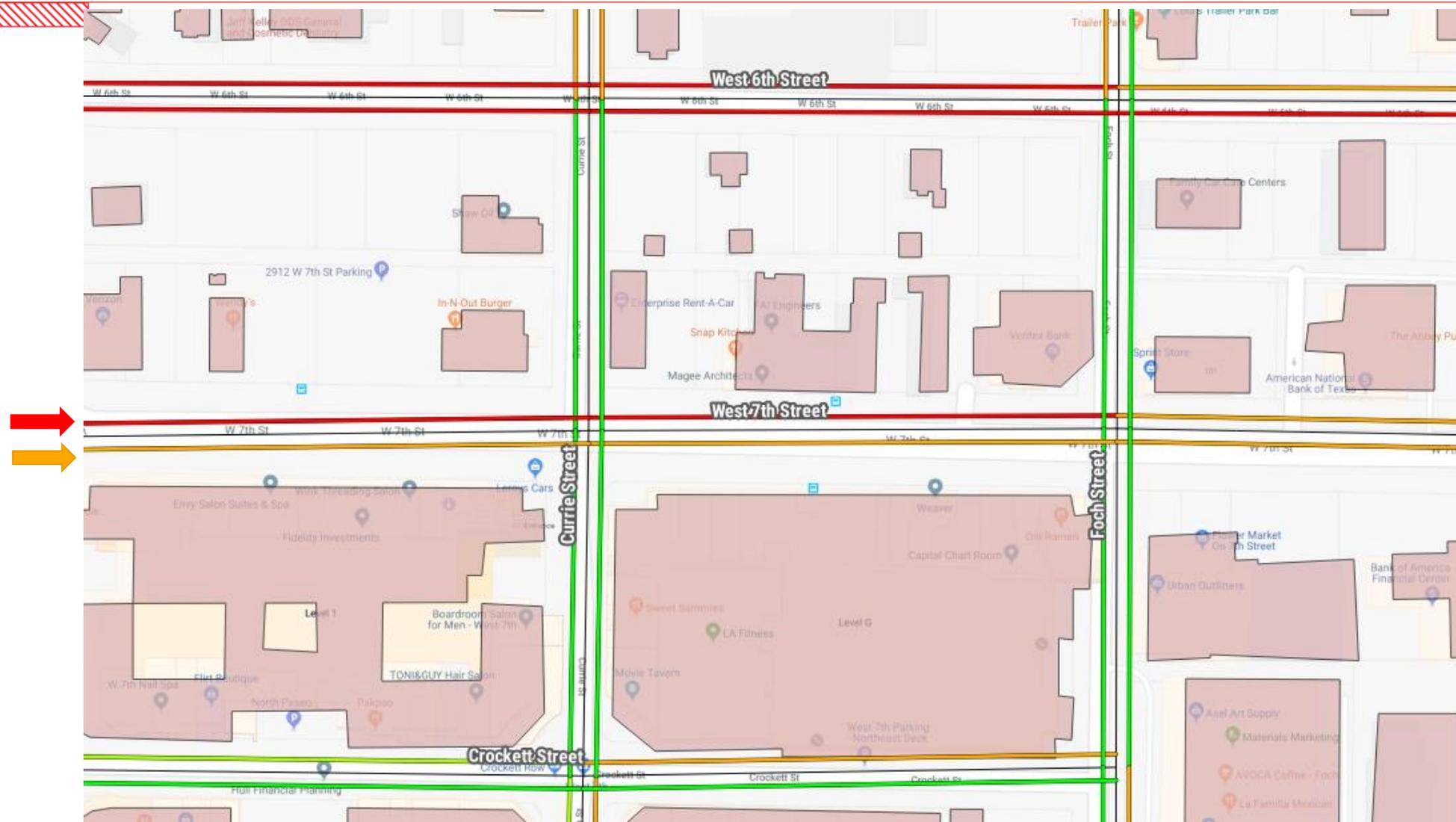
North Side of West 7th

- Traffic Speed
- Lanes
- Block Length
- Driveways
- Sidewalks
- Parking
- Bike Lane
- Building Setbacks



South Side of West 7th

West 7th Street



1 = Positive Experience

4 = Negative Experience

How It Will Be Used in Fort Worth

Stakeholder discussion:

- Sidewalk project prioritization factor
- Inform ADA planning, problem identification, and prioritization
- Support the Race and Culture initiative, which has a goal of reducing sidewalk gaps in Majority Minority Areas (MMAs)
- Contribute to project scoping related to the connectivity of neighborhoods