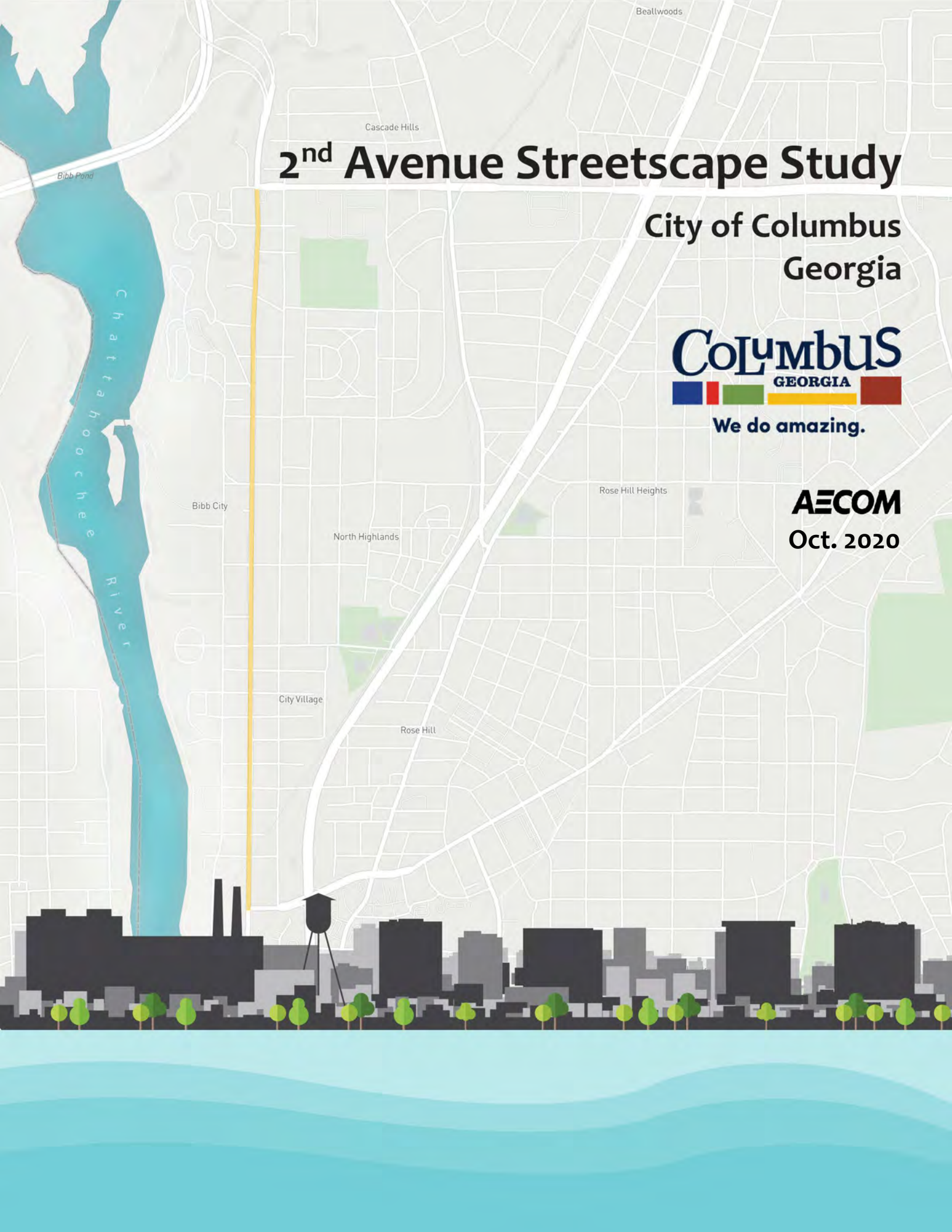


2nd Avenue Streetscape Study

City of Columbus
Georgia



AECOM
Oct. 2020



ACKNOWLEDGMENTS



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TABLE OF CONTENTS

1	INTRODUCTION	5
	1.1 Executive Summary	6
	1.2 Background.....	8
	1.3 Project Limits	9
	1.4 Goals and Objectives.....	10
	1.5 Process.....	11
2	DESIGN ANALYSIS	13
	2.1 History of Columbus.....	14
	2.2 Existing Conditions	15
	2.3 Existing Trail System	16
	2.4 Topographic Analysis.....	18
	2.5 Figure-Ground Diagram.....	20
	2.6 Existing/Future Land Use	22
	2.7 Opportunities and Constraints	26
	2.8 Driveway Consolidation Opportunities.....	38
	2.9 Existing Typical Sections	50
3	TRANSPORTATION SYSTEM ANALYSIS	57
	3.1 Traffic Analysis	58
	3.2 Capacity Analysis.....	60
	3.3 Diversion Sensitivity Analysis.....	72
	3.4 Pedestrian Evaluation	76
	3.5 Pedestrian/Bike/Automobile Intensity Heat Map	78
	3.6 Sidewalk Zones	88
	3.7 Active Travel	90
4	CORRIDOR PLAN	117
	4.1 Overall Plan	118
	4.2 Enlargement.....	136
	4.3 Proposed Typical Sections.....	142
	4.4 Concept Renderings.....	158
	4.5 Material Considerations.....	160
	4.6 Site Furniture Considerations	164
	4.7 Gateway and Wayfinding Signage.....	166
	4.8 Green Infrastructure Tool Kit	178
5	FUNDING AND ESTIMATION	191
	5.1 Potential Funding Opportunities.....	192
	5.2 Cost Estimate.....	194
6	APPENDIX	197
	6.1 Data Collection Locations.....	198
	6.2 Pedestrian Study.....	202
	6.3 Traffic Counts and Growth Rate	208
	6.4 Right-sizing Policy Examples	214
	6.5 Case Studies	218
	6.6 Public Involvements.....	222



01

INTRODUCTION

- 1.1 Executive Summary
- 1.2 Background
- 1.3 Project Limits
- 1.4 Goals and Objectives
- 1.5 Process

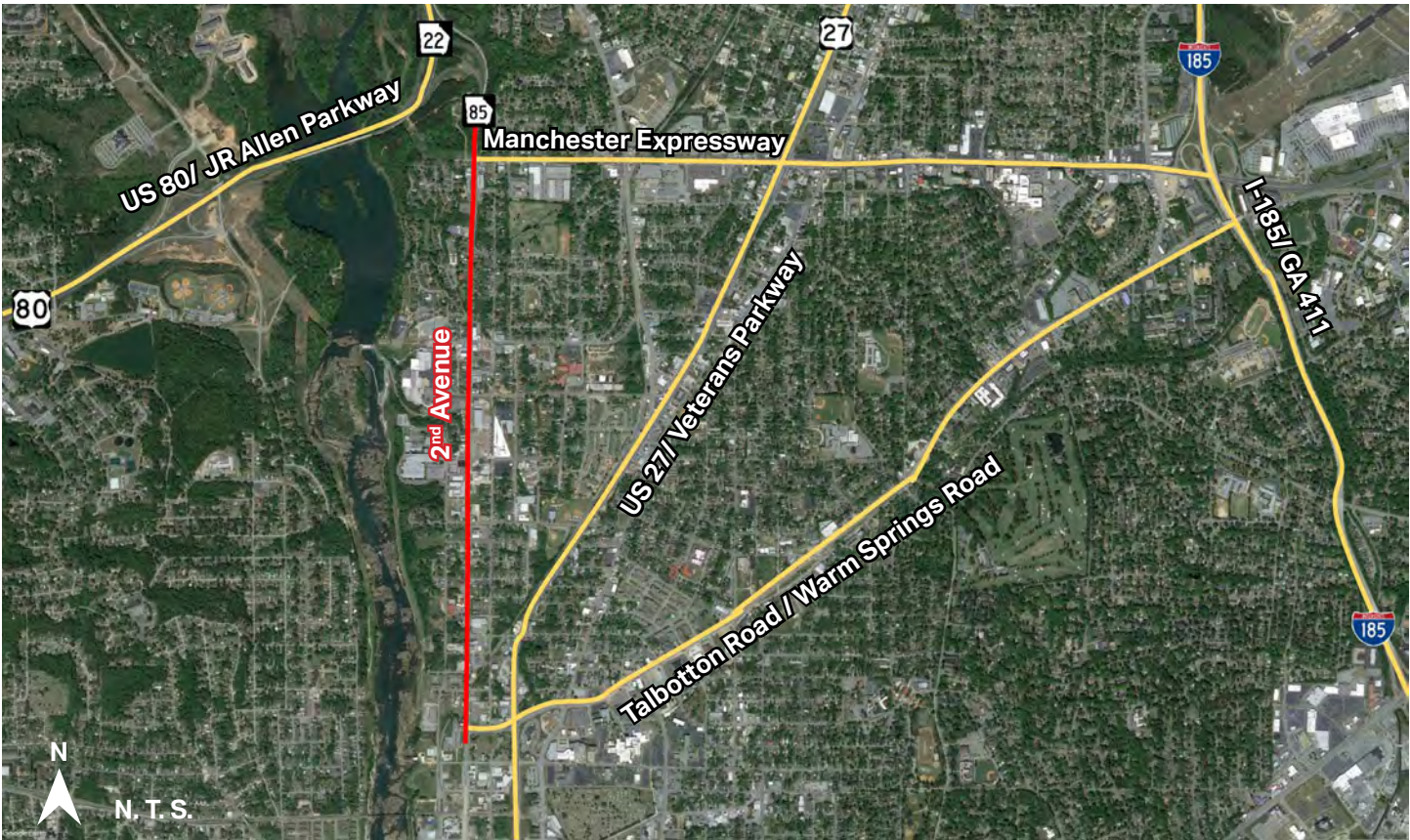
1.1 EXECUTIVE SUMMARY

On November 27, 2018, the Council of Columbus, Georgia voted to enter into a contractual agreement with the Georgia Department of Transportation to conduct a Streetscape study on 2nd Avenue.

The project limits along 2nd Avenue extend from the north at its intersection with Manchester Expressway south to its intersection with 19th Street/Talbotton Road.

The purpose of this planning study is to develop a new vision for 2nd Avenue to improve the aesthetic appeal and functionality of the road for all users. The study will be focused on transportation, streetscape character, and wayfinding signage. The end goal is to develop a shared Vision to enhance the mobility and aesthetics of the 2nd Avenue corridor. The study should focus and analyze six main objectives:

- Conceptual wayfinding and gateway design
- Considerations for sustainable/resilient/green Infrastructure within the project corridor
- Enhancement of current and future pedestrian activity nodes
- Multi-modal functionality/Complete Streets. Facilities to be evaluated include; wider sidewalks, two-way cycle track, one-way cycle tracks, shared-use paths, bike lanes, and bike sharrows. Further, existing transit stop locations will be evaluated to determine if additional improvements shall be made.
- Through on-site observations and utilizing GIS data, the study will evaluate existing user accessibility and intensity to existing destinations along 2nd Avenue. A corridor/connectivity heat map will be used to demonstrate the intensity of uses.
- Traffic analysis of current roads, sidewalks, and paths and how they affect vehicular, bike, pedestrian and public transit



Road Identification Map

As part of this study, a traffic analysis was conducted which included an evaluation of the traffic conditions under the Existing Year 2020, Opening Year 2027 No-Build and Build alternatives, and Design Year 2047 No-Build and Build alternatives. Furthermore, recommendations will be made on the viability of a road/lane diet throughout the corridor. The traffic study will determine the impact a road/lane diet would have on vehicular traffic operations along the corridor as well as determine any necessary intersection improvements necessary to maintain acceptable traffic operations through the design year of the project. In addition, several locations along 2nd Avenue were identified as being candidates for consideration of pedestrian crossings due to land use, origins and destinations, and observed pedestrian crossings in these areas. Appendix 6.2 includes the study used to determine the viability, the need and location of mid-block pedestrian crossings along the study corridor.

Within the project limits, 2nd Avenue is currently two lanes of travel in each direction and north of the 32nd Street intersection includes a center two-way left-turn lane with limited pedestrian facilities, an abundance of curb cuts and a posted speed limit of 35 mph. The proposed concept plan utilized a streetscape tool kit, including landscaped medians, street trees, pedestrian lightings, and gateway features.

Additionally, the City advertised and held two virtual public events in July and October. The project was well received by the respondents. The City, in close coordination with their consultant, has produced a vision for 2nd Avenue and associated Scoping Document and Concept Layout to lay the groundwork for the next phases of 2nd Avenue promoting a safe corridor which serves as a gateway into downtown promoting health and wellness, environmental stewardship and potential redevelopment opportunities through transportation infrastructure improvements.

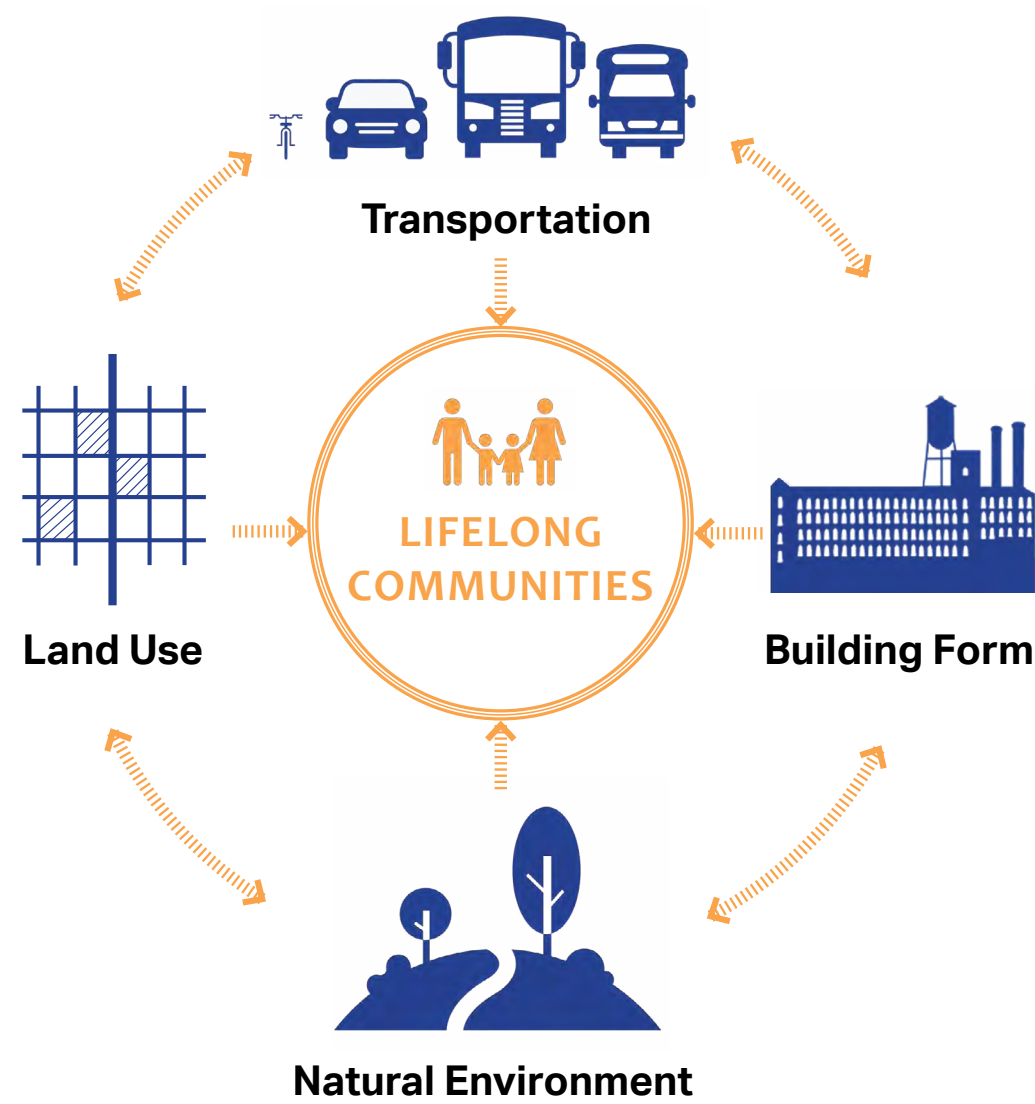


Intersection of 38th Street and 2nd Avenue Concept

1.2 BACKGROUND

2nd Avenue is poised to become the northern gateway into historic downtown Columbus. Travelers destined for downtown Columbus from Alabama to the west and Atlanta to the north will eventually take 2nd Avenue to reach their destination. This presents an incredible opportunity to welcome people to downtown Columbus, making it clear that they have arrived at one of the most unique and charming cities. However, 2nd Avenue does not currently live up to its potential. Its four to five lanes of vehicular travel, fast speeds, deteriorated sidewalks, and lack of street trees and lighting make this area uncomfortable for people. People are the lifeblood of the economy of a city and they should be provided with a beautiful space to enjoy.

This study aims to change this by building a Vision to transform 2nd Avenue into a diverse and inclusive public space. 2nd Avenue will help foster economic growth and accommodate future accessibility, connectivity, mobility, and a high standard of quality of life for all. By approaching this corridor with a holistic perspective that seeks to integrate transportation, land-use, the natural environment, and building form, the City of Columbus can transform this corridor into a vibrant lifelong community that will be cherished by citizens and tourists alike.



1.3 PROJECT LIMITS

2nd Avenue is a four-lane arterial and a gateway into Downtown Columbus. In the 1980's, the road was widened from two lanes to four lanes. The right-of-way along this corridor varies and is constrained in some places. The study limits are Manchester Expressway to Talbotton Road, which is approximately 1.9 miles.



1.4 GOALS AND OBJECTIVES

The purpose of this study is to build a Vision for 2nd Avenue as a treasured public space in downtown Columbus. The vision includes promoting green resilient infrastructure, intensity-driven development, and mobility/accessibility to prominent local and regional nodes. Further, the study is focused on transportation, streetscape character, and wayfinding signage. Specifically, the study explores six goals and objectives detailed below.



Promote multi-modal options

Enhance current and future pedestrian activity nodes. The study team will identify opportunities to locate new pedestrian activity nodes as well as provide a tool kit for enhancing existing pedestrian activity nodes.



Promote sustainability

Considerations for sustainable/resilient/green Infrastructure within the project corridor. The study team will explore potential green infrastructure best management practices to apply to 2nd Avenue Corridor project limits.



Recommend safety improvements

Improve pedestrian safety and upgrade pedestrian facilities such as pedestrian scale lighting, ADA ramps, protected mid-block crossings and wider buffered sidewalks.



Analyze traffic

Conduct traffic analysis of current roads, sidewalks and paths and how they affect vehicular, bike, pedestrian and public transit. Recommendations on lane widths and overall street design will be evaluated and proposed.



Create gateway feature

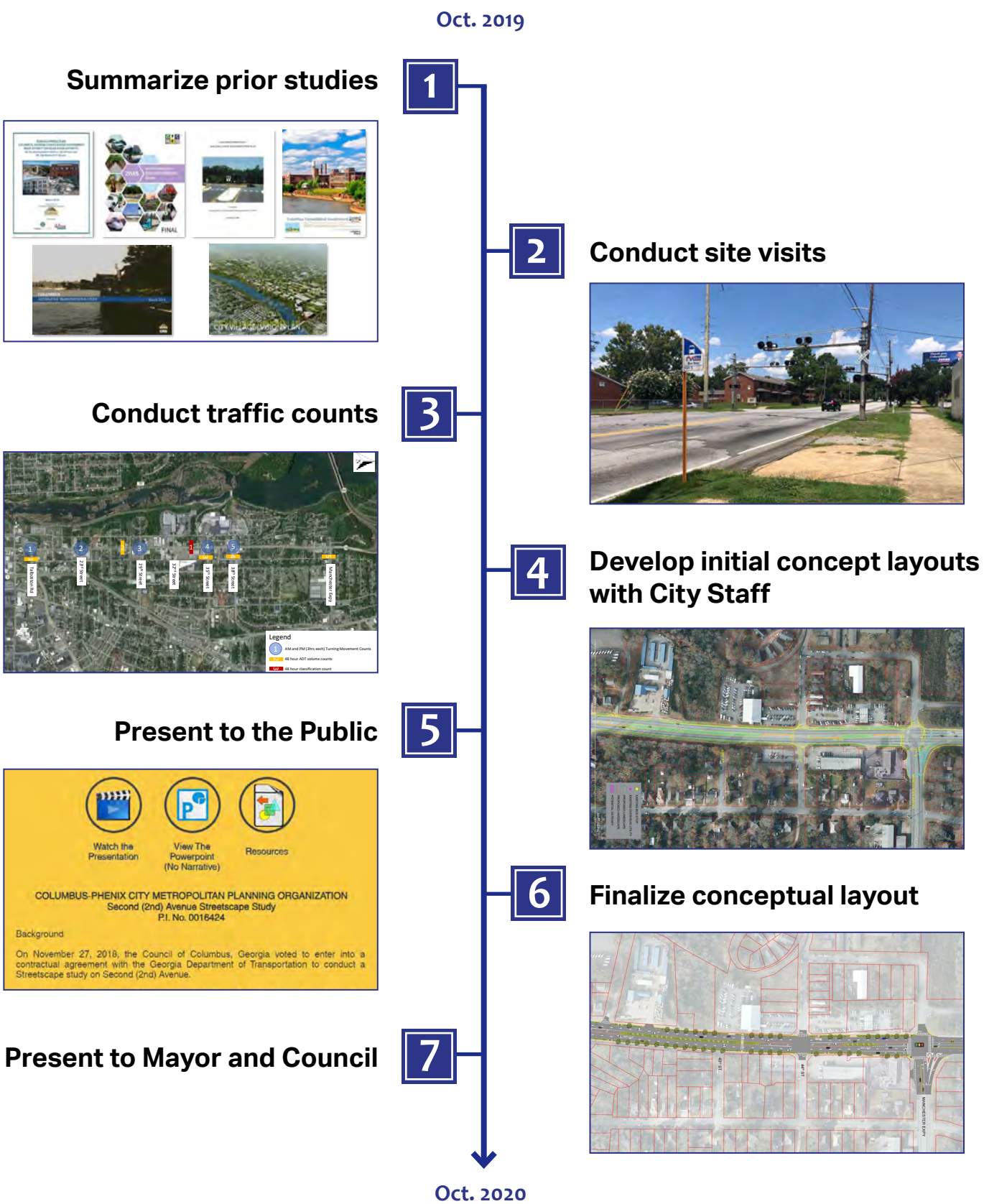
First impressions are lasting. A unique Gateway/ Wayfinding system will be developed to welcome visitors and citizens to the area and guide them to the charming places in downtown Columbus.



Enhance connectivity

Identify routes to provide better connectivity throughout downtown Columbus. Careful attention will be paid to getting people in and around downtown Columbus.

1.5 PROCESS





02

DESIGN ANALYSIS

- 2.1 History of Columbus
- 2.2 Existing Conditions
- 2.3 Existing Trail System
- 2.4 Topographic Analysis
- 2.5 Figure-Ground Diagram
- 2.6 Existing/Future Land Use
- 2.7 Opportunities and Constraints
- 2.8 Driveway Consolidation Opportunities
- 2.9 Existing Typical Sections

2.1 HISTORY OF COLUMBUS

Columbus was established in 1828 on the Chattahoochee River. Once a major center for textile manufacturing, it is a great example of a true river city. Columbus was also one of the most important industrial centers of the south in the early 1900s. Many marks of this history still remain in the form of Columbus mills, which have been cleverly reused.



Bibb Company



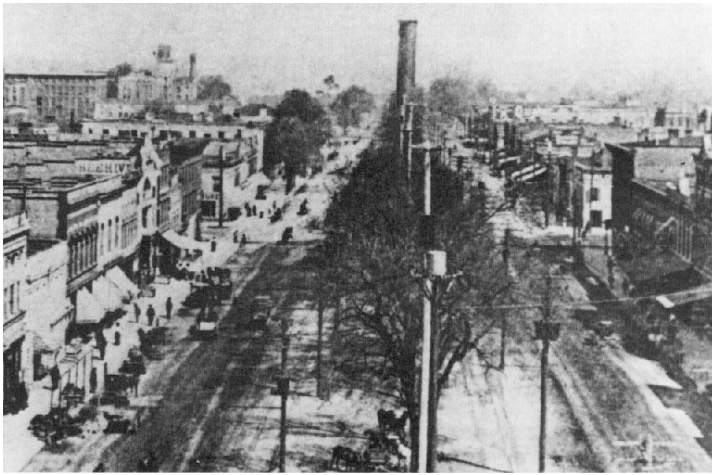
House along 2nd Avenue



The First Textile Mill



Broad Street in 1897



Downtown Columbus approximately 1900



Downtown Columbus in 1950

2.2 EXISTING CONDITIONS

2nd Avenue is characterized by its wide right-of-way that is largely dedicated to vehicular travel. There are always two-lanes of travel in each direction, and north of the 32nd Street intersection includes a center two-way left-turn lane. Although the sidewalks are connected, they are occasionally in disrepair and are generally uninviting.



2nd Avenue



2nd Avenue



Existing Crosswalk



Existing Bus Stop



Industrial Site along 2nd Avenue



Developments along 2nd Avenue

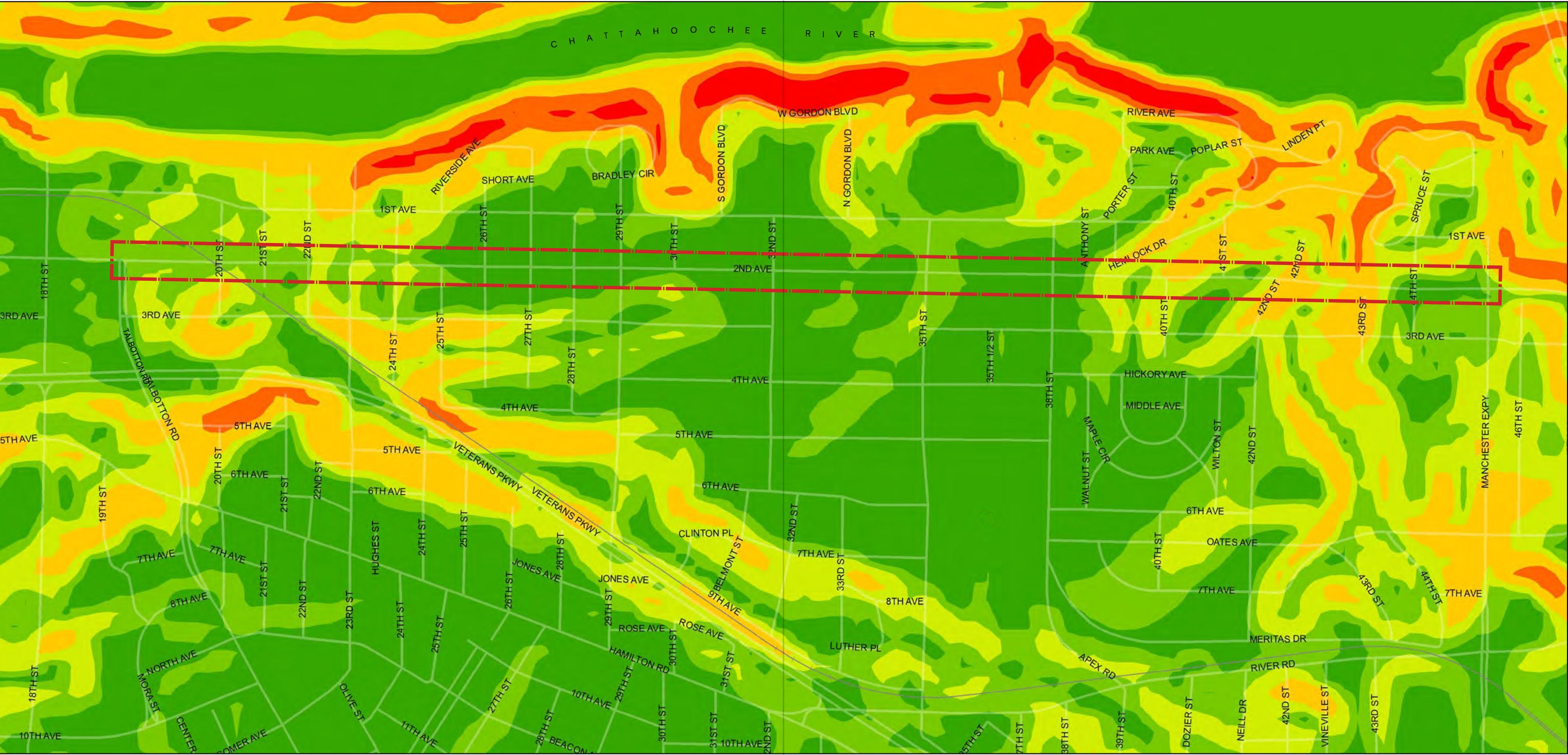
2.3 EXISTING TRAIL SYSTEM



LEGEND

- Existing Trails
- Proposed River Link Trails

2.4 TOPOGRAPHIC ANALYSIS



LEGEND

0% - 1.5%

1.6% - 3.0%

3.1% - 5.0%

5.1% - 10.0%

10.1% - 15.0%

> 15.0%

Project Limits

18 DESIGN ANALYSIS | City of Columbus

2nd Avenue Streetscape Study | DESIGN ANALYSIS 19

2.5 FIGURE-GROUND DIAGRAM

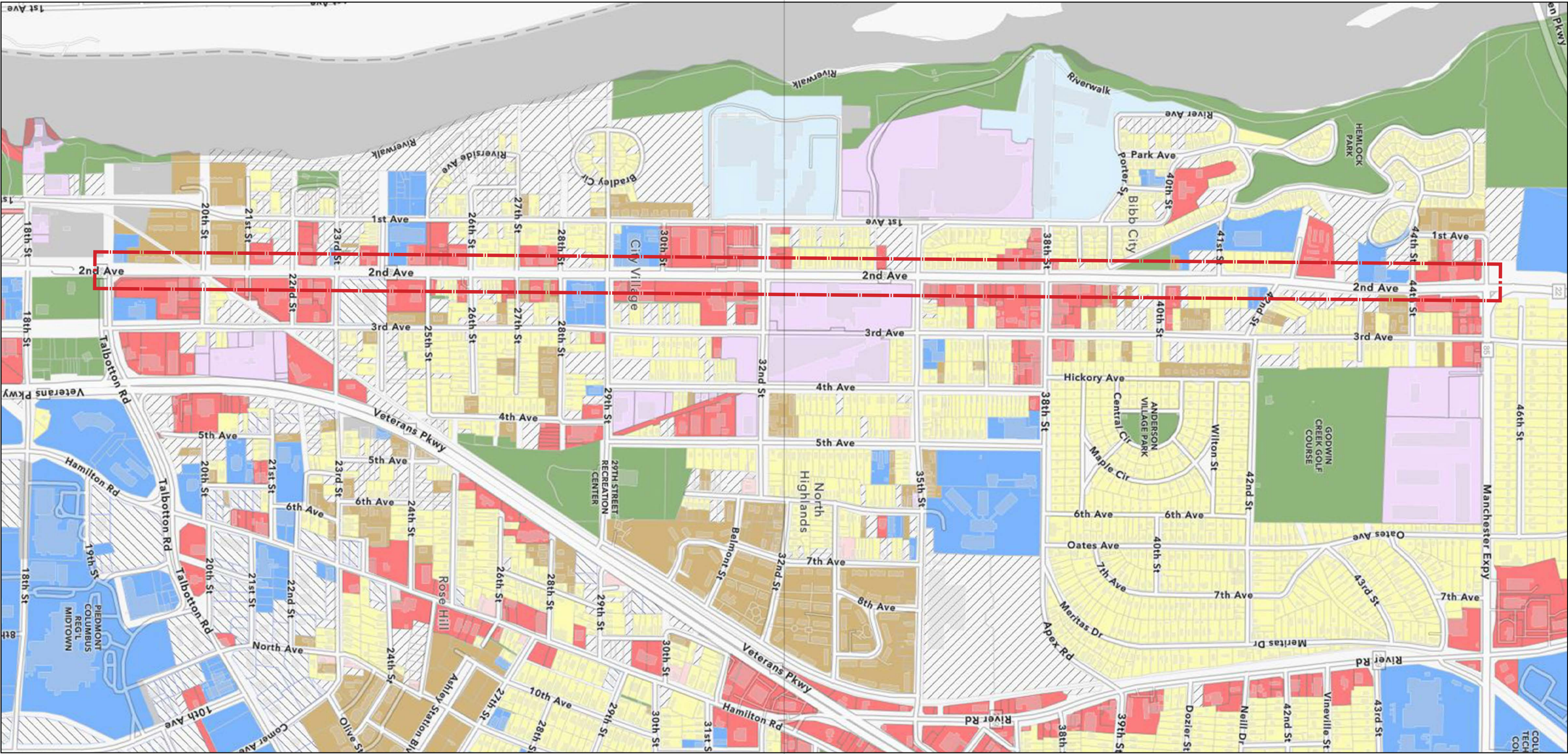


LEGEND

- Building Footprint
- Project Limits



2.6 EXISTING LAND USE

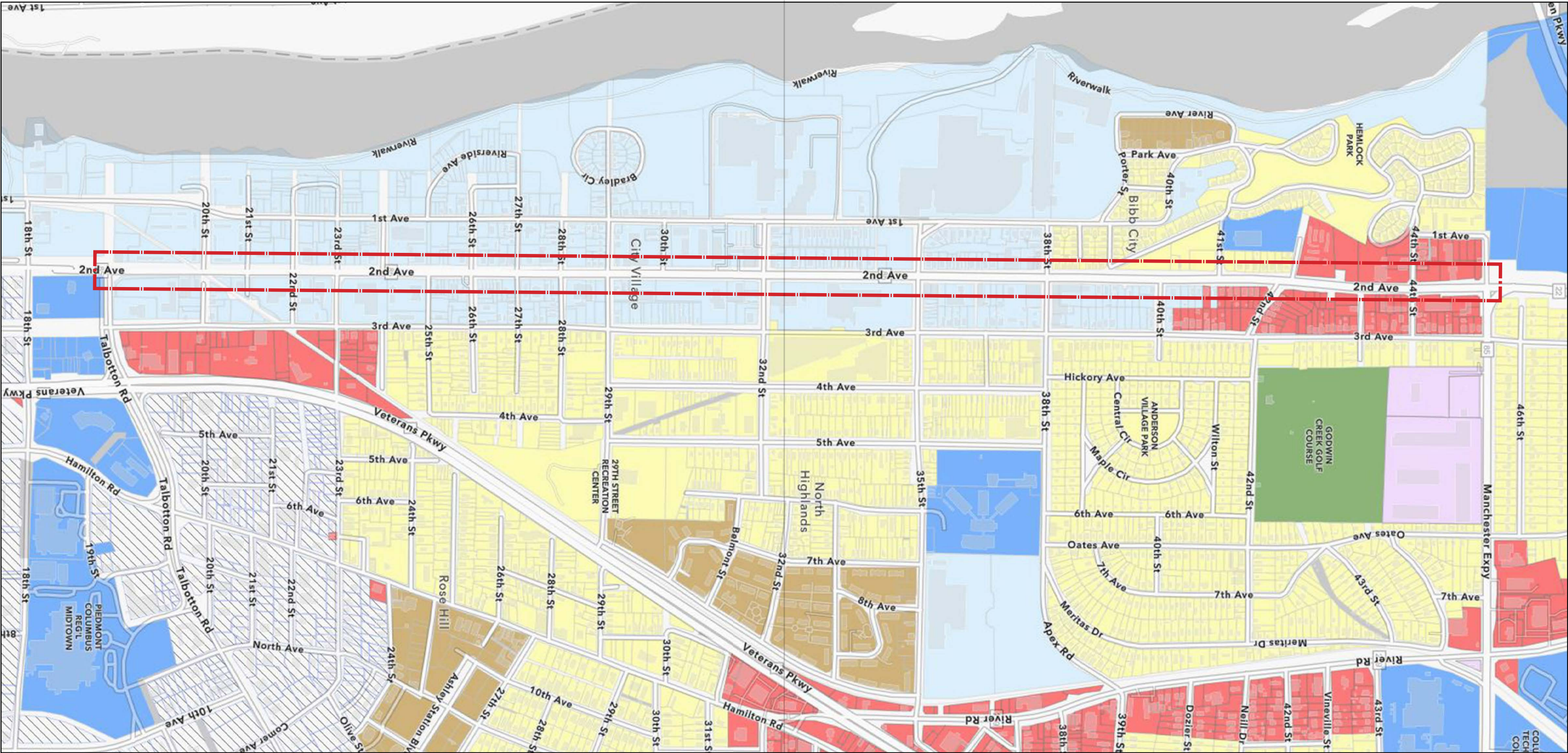


LEGEND

- | | | | |
|--------------------------------|---------------------------|-------------------------------|--------------------------------------|
| General Commercial | Mobile Homes/Trailer Park | Parks/Recreation/Conservation | Transportation/Communication/Utility |
| Heavy Manufacturing/Industrial | Multifamily | Public/Institutional | Vacant/Undeveloped |
| Light Manufacturing/Industrial | Neighborhood Commercial | Rural Residential | Project Limits |
| Mixed Use | Office/Professional | Single Family Residential | |



2.6 FUTURE LAND USE



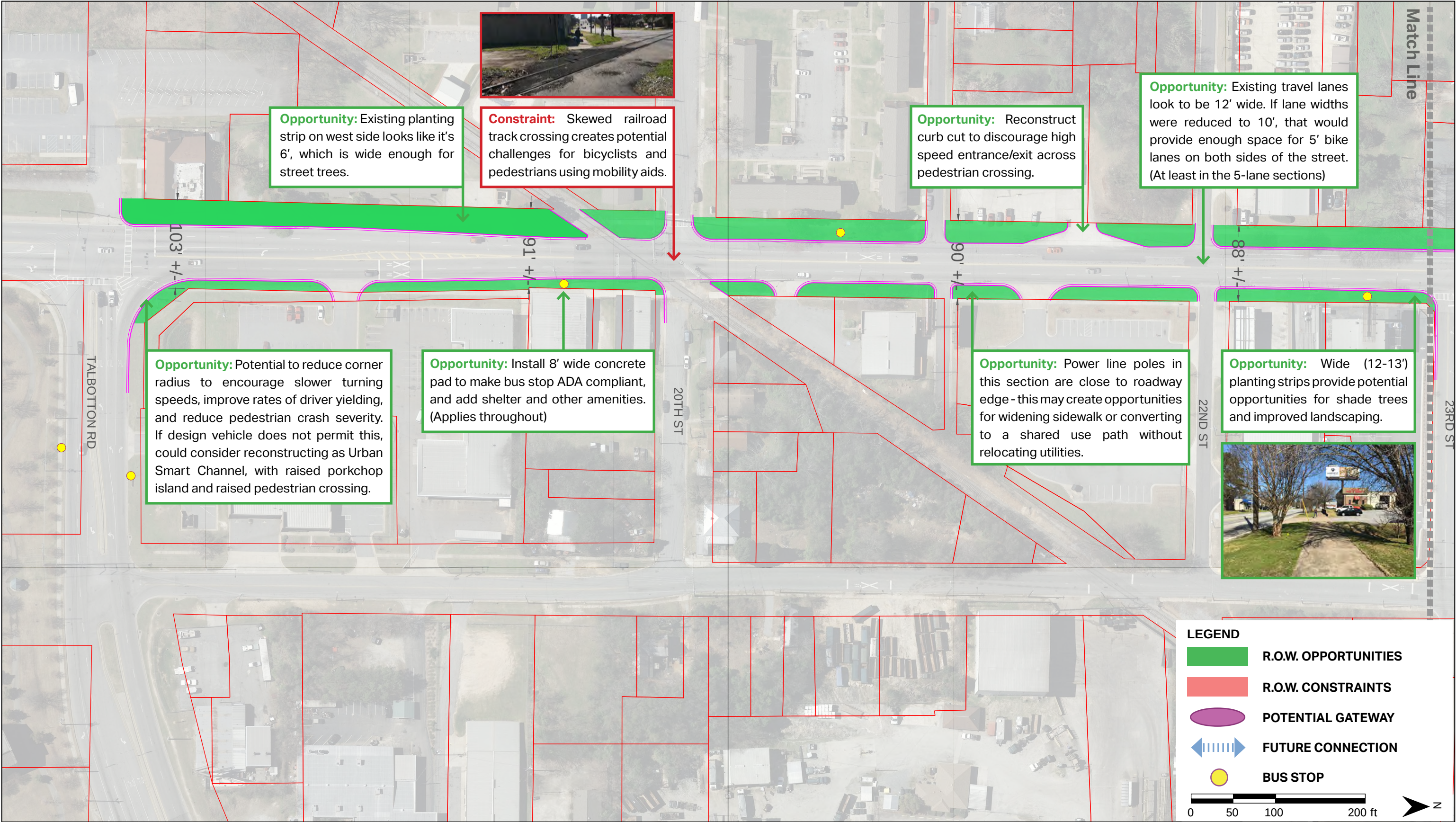
LEGEND

- | | | | |
|--------------------------------|-------------------------|-------------------------------|--------------------------------------|
| General Commercial | High Density Mixed Use | Parks/Recreation/Conservation | Transportation/Communication/Utility |
| Heavy Manufacturing/Industrial | Multifamily | Public/Institutional | Vacant/Undeveloped |
| Light Manufacturing/Industrial | Neighborhood Commercial | Rural Residential | Project Limits |
| Mixed Use | Office/Professional | Single Family Residential | |



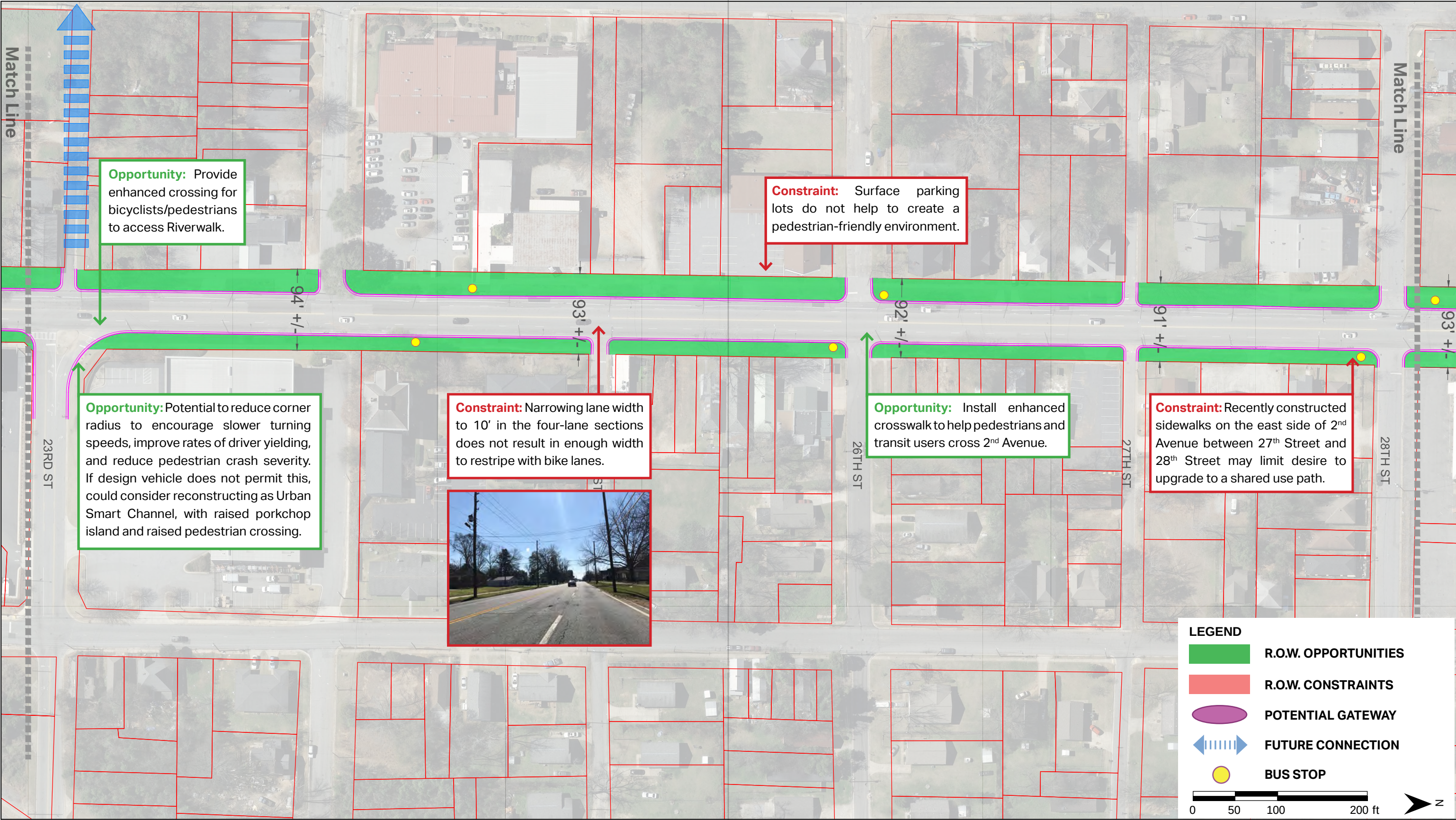
2.7 OPPORTUNITIES AND CONSTRAINTS

TALBOTTON ROAD TO 23rd STREET



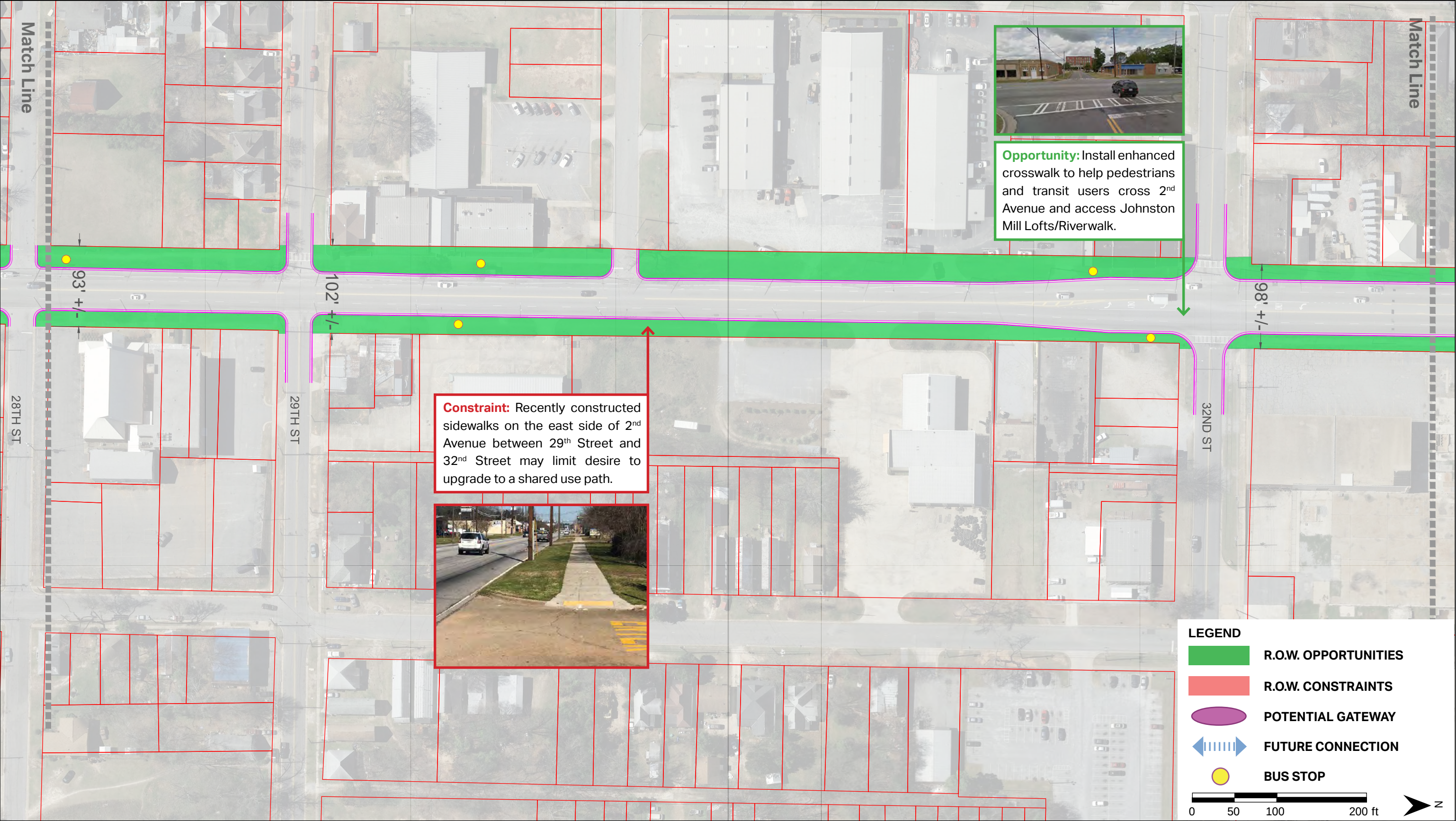
2.7 OPPORTUNITIES AND CONSTRAINTS

23rd STREET TO 28th STREET



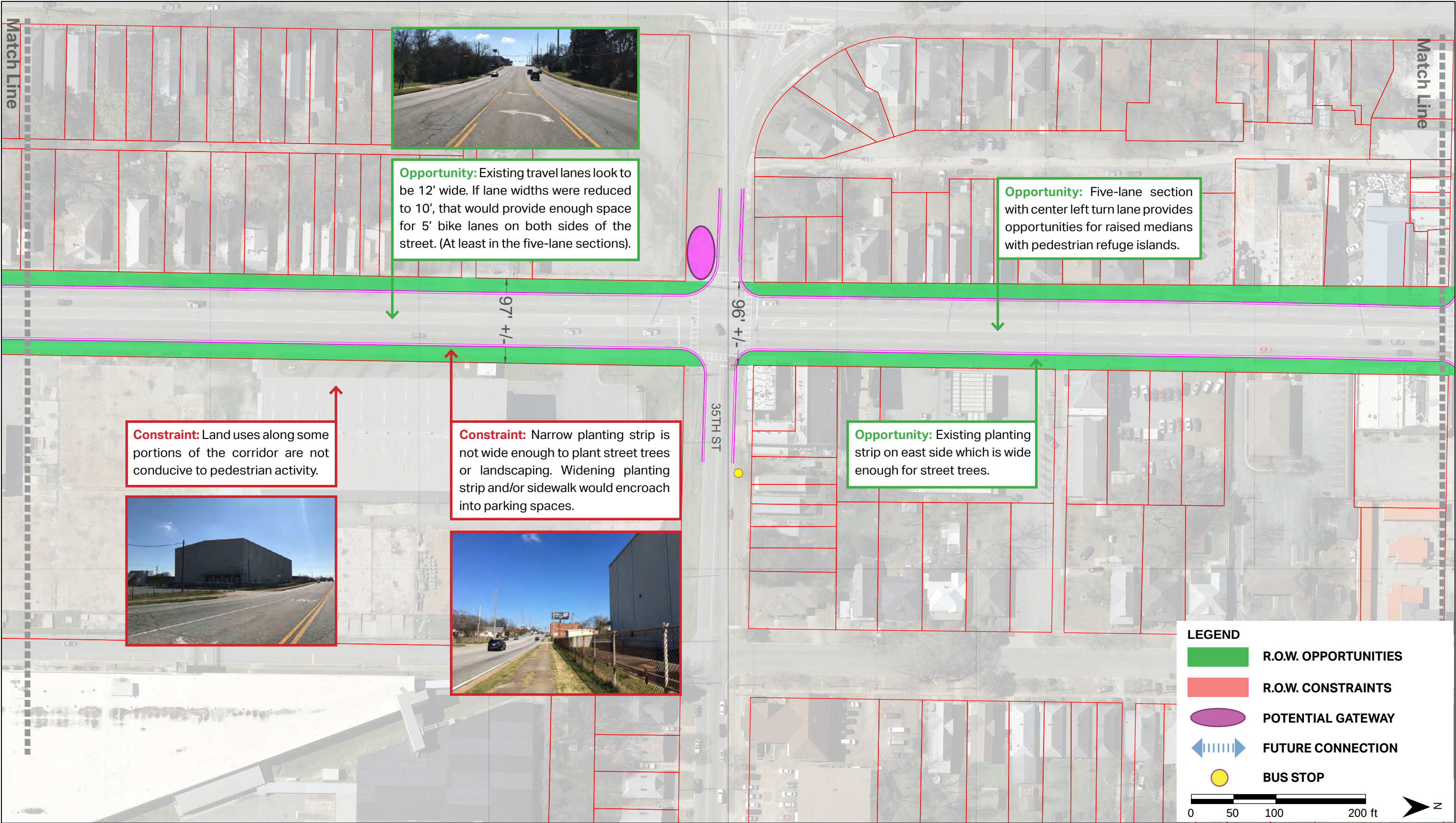
2.7 OPPORTUNITIES AND CONSTRAINTS

28th STREET TO 32nd STREET



2.7 OPPORTUNITIES AND CONSTRAINTS

32nd STREET TO 38th STREET



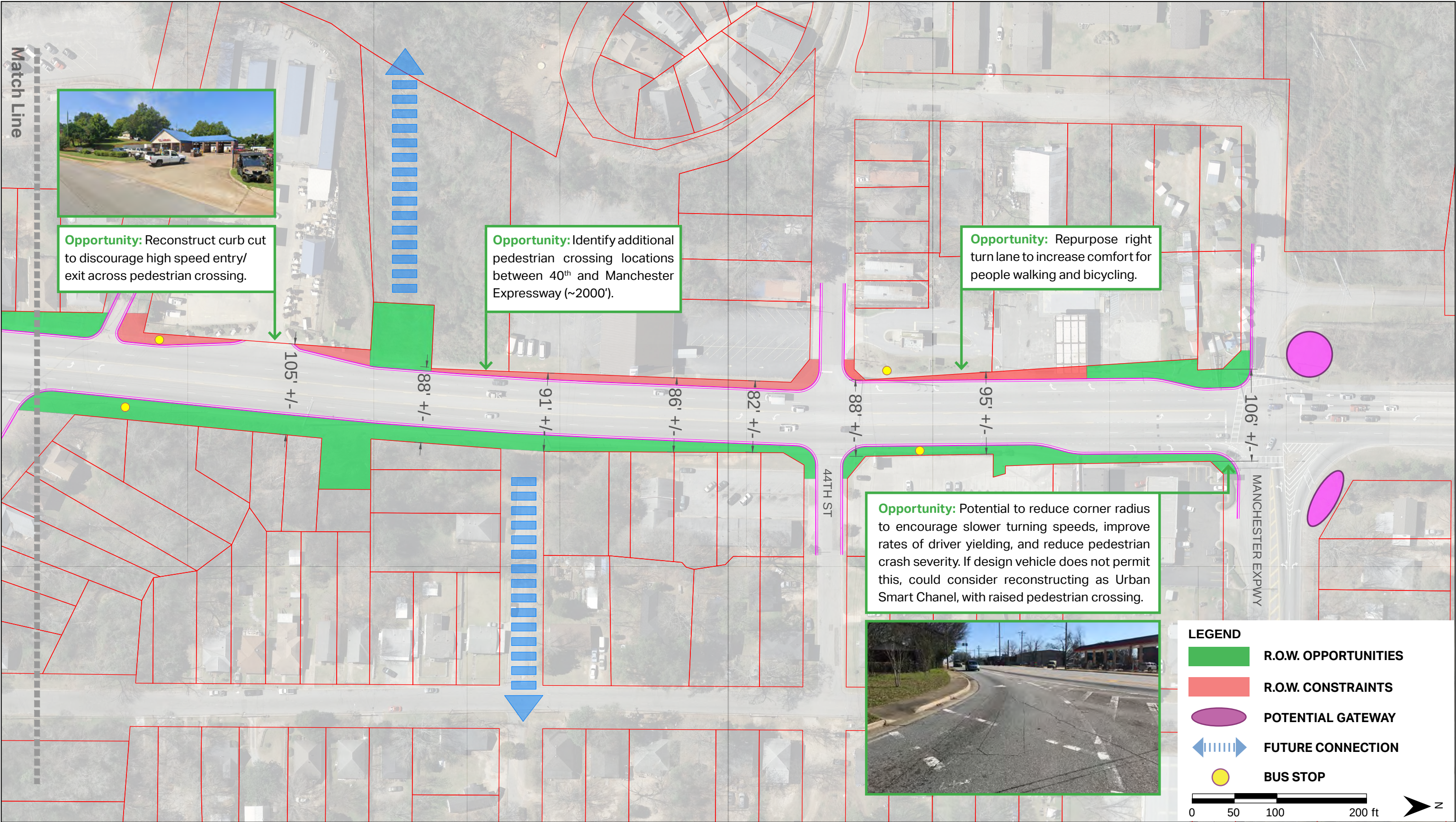
2.7 OPPORTUNITIES AND CONSTRAINTS

38th STREET TO 42nd STREET



2.7 OPPORTUNITIES AND CONSTRAINTS

42nd STREET TO MANCHESTER EXPRESSWAY



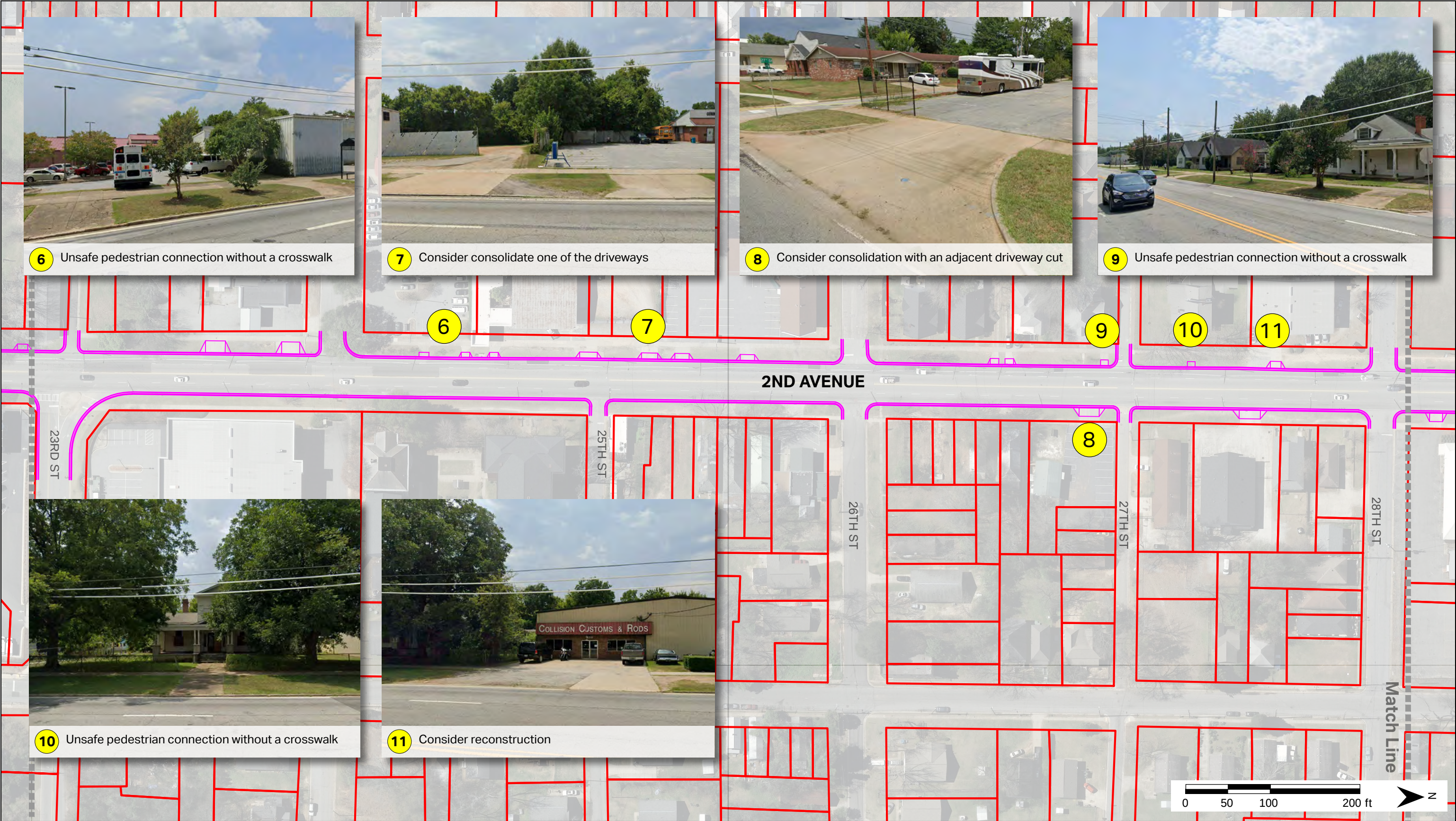
2.8 DRIVEWAY CONSOLIDATION OPPORTUNITIES

TALBOTTON ROAD TO 23rd STREET



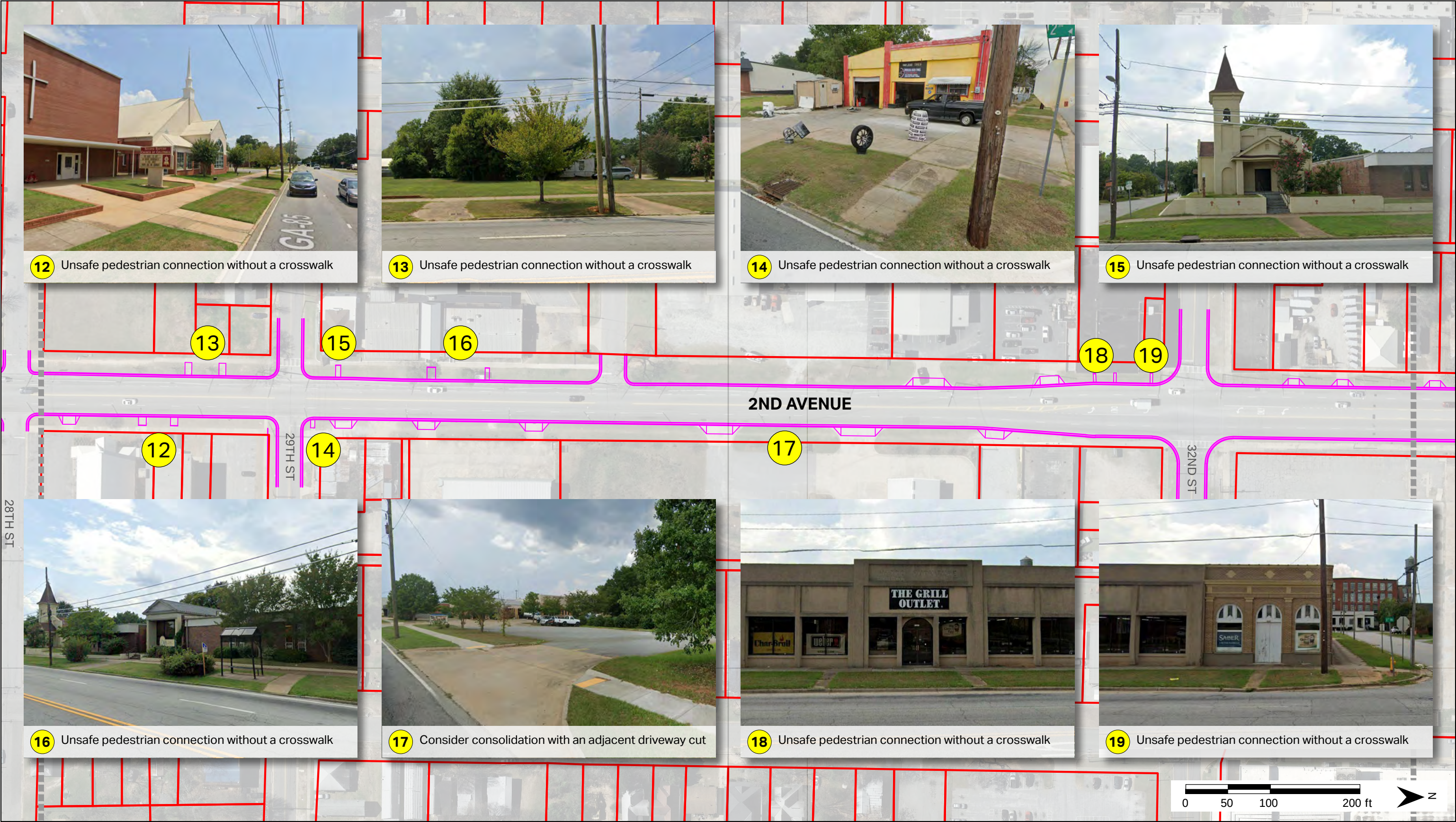
2.8 DRIVEWAY CONSOLIDATION OPPORTUNITIES

23rd STREET TO 28th STREET



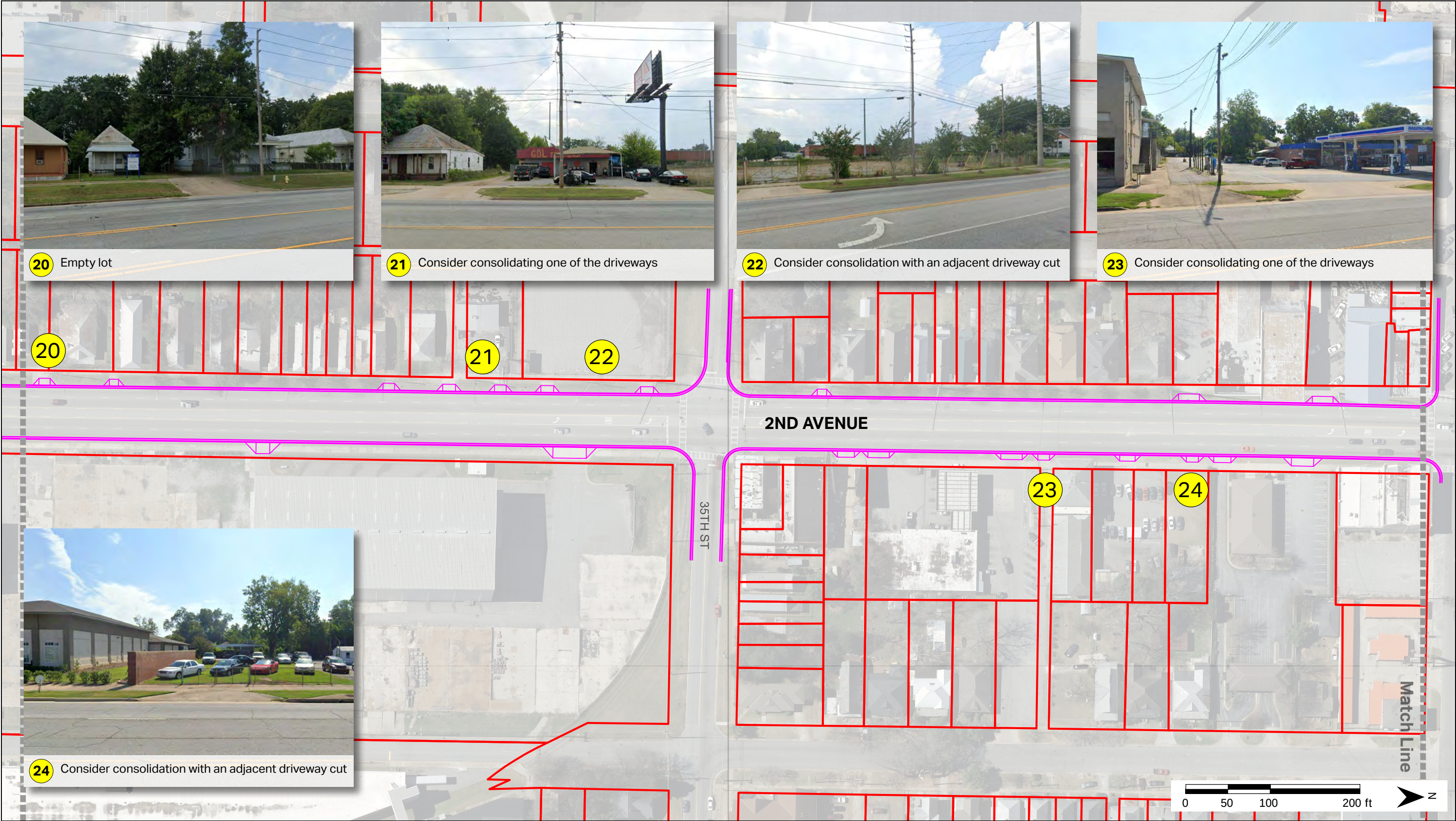
2.8 DRIVEWAY CONSOLIDATION OPPORTUNITIES

28th STREET TO 32nd STREET



2.8 DRIVEWAY CONSOLIDATION OPPORTUNITIES

32nd STREET TO 38th STREET



2.8 DRIVEWAY CONSOLIDATION OPPORTUNITIES

38th STREET TO 42nd STREET



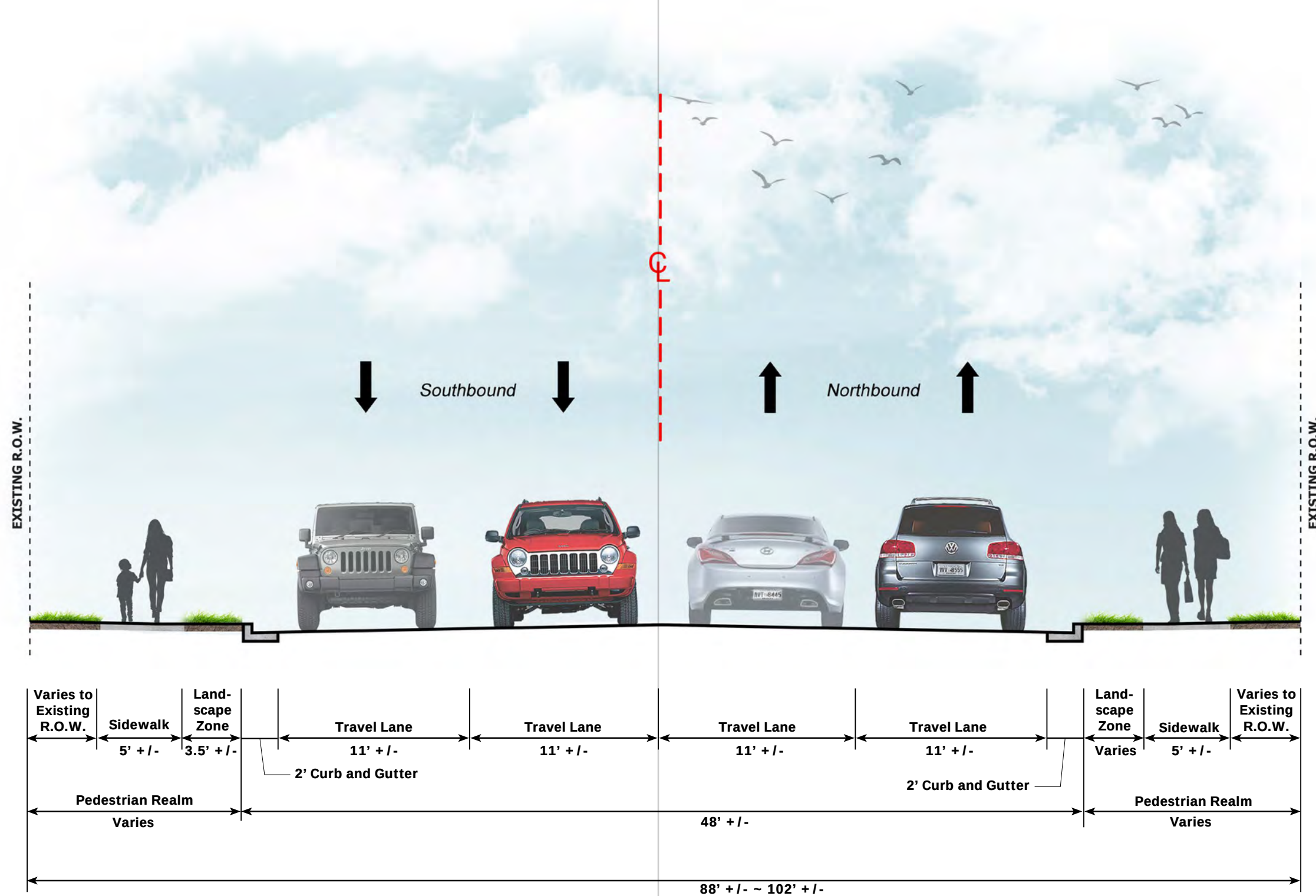
2.8 DRIVEWAY CONSOLIDATION OPPORTUNITIES

42nd STREET TO MANCHESTER EXPRESSWAY



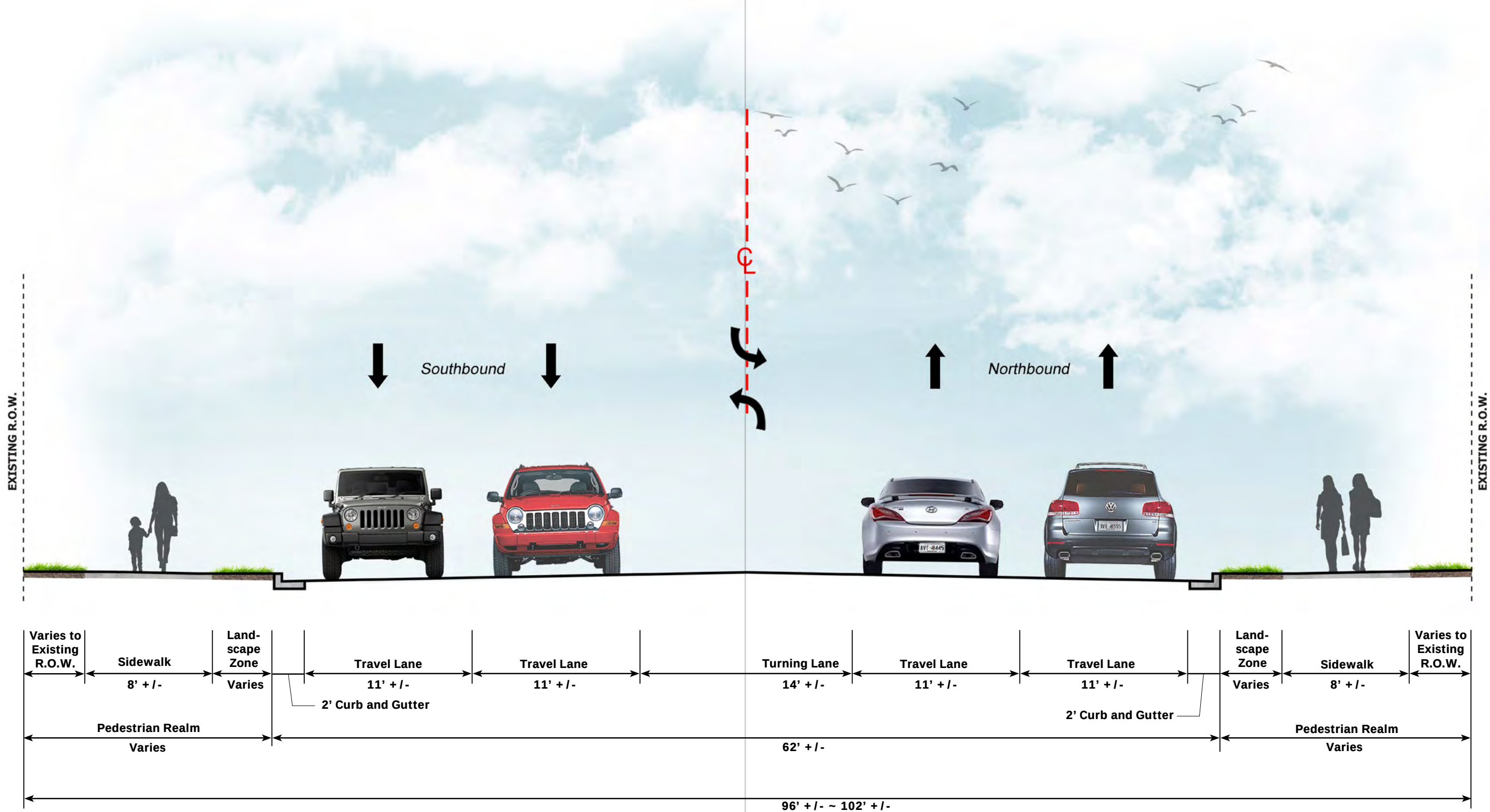
2.9 EXISTING TYPICAL SECTIONS

20th STREET TO 30th STREET



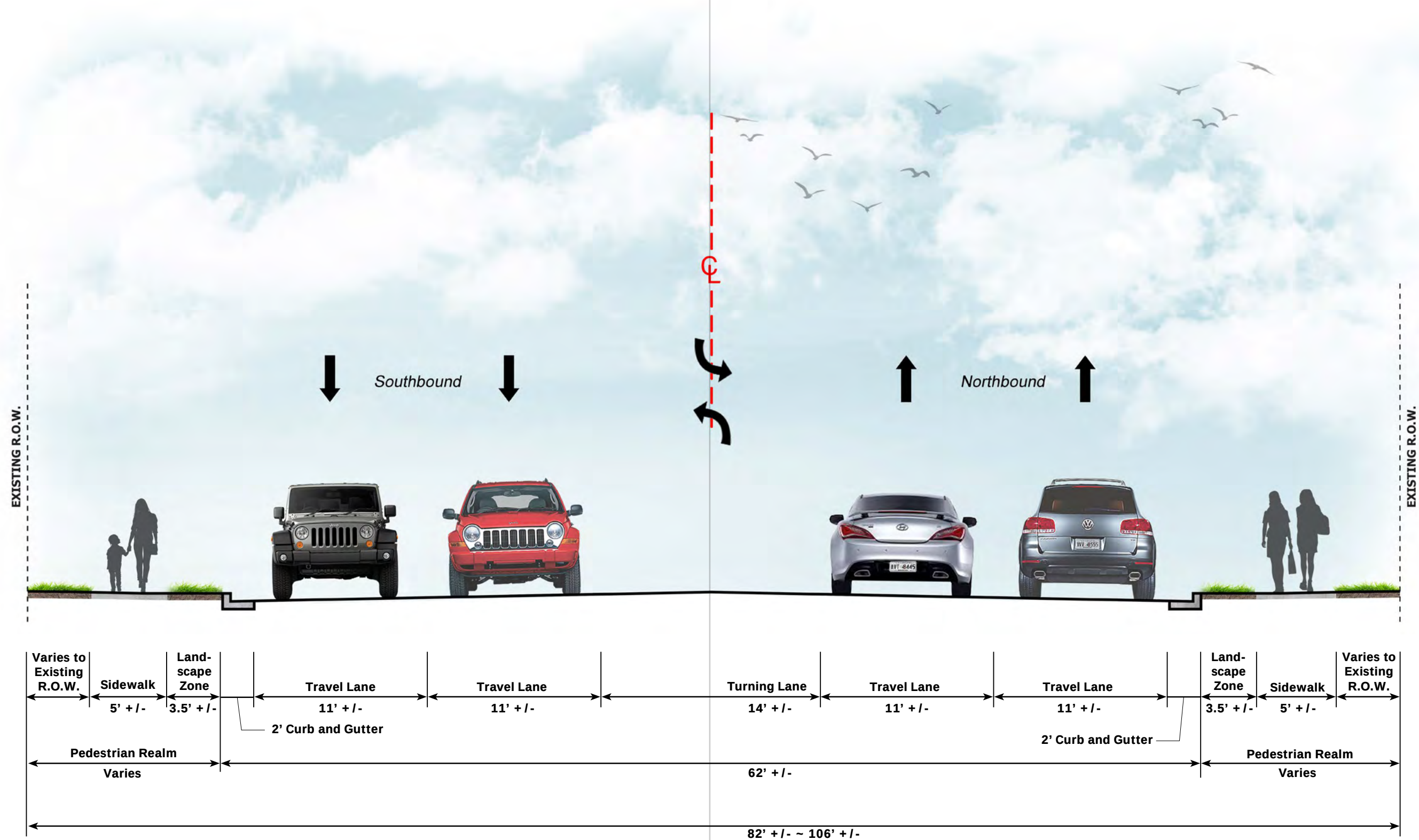
2.9 EXISTING TYPICAL SECTIONS

32nd STREET TO 38th STREET



2.9 EXISTING TYPICAL SECTIONS

38th STREET TO 44th STREET





03

TRANSPORTATION SYSTEM ANALYSIS

- 3.1 Traffic Analysis
- 3.2 Capacity Analysis
- 3.3 Diversion Sensitivity Analysis
- 3.4 Pedestrian Evaluation
- 3.5 Pedestrian/ Bike/ Automobile Heat Map
- 3.6 Sidewalk Zones
- 3.7 Active Travel

3.1 TRAFFIC ANALYSIS

Introduction

The SR 85/2nd Avenue corridor in Columbus, GA is being investigated for the potential for improvements along the corridor. As part of these improvements, the potential for a road/lane diet is being investigated to provide space within the public right of way to enhance bicycle and pedestrian accommodations. This traffic study will determine the impact a road/lane diet would have to vehicular traffic operations along the corridor as well as determine any necessary intersection improvements necessary to maintain acceptable traffic operations through the design year of the project.

Traffic Analysis Scope

This study includes an evaluation of the traffic conditions under the Existing Year 2020, Opening Year 2027 No-Build and Build alternatives, and Design Year 2047 No-Build and Build alternatives. Furthermore, recommendations will be made on viability of a road/lane diet throughout the corridor. In order to complete this analysis, the following tasks were performed:

- Determine critical intersections for study
- Collect traffic data at the determined critical intersections
- Investigate historic traffic data for determination of a corridor growth rate
- Develop traffic forecasts for critical intersections
- Analyze intersections and corridor using Highway Capacity Manual (HCM) based analysis for each alternative
- Provide results and recommendations in a traffic engineering report

Critical Study Intersections Determination

Critical corridor intersections were selected for data collection and inclusion in the analysis based on two criteria. Intersections which are currently signalized would be included in the study and intersections whose cross streets connected SR 1/Veterans Parkway to the east would be included. Based on these criteria six (6) intersections were determined to be critical to the corridor. These intersections are as follows:

- 2nd Avenue at Talbotton Road
- 2nd Avenue at 23rd Street
- 2nd Avenue at 29th Street
- 2nd Avenue at 35th Street
- 2nd Avenue at 38th Street
- 2nd Avenue at Manchester Expressway

Data Collection and Growth Rate

Traffic data was collected by National Data and Surveying Services for all intersections except SR 85/2nd Avenue at Manchester Expressway which was collected by Traffic Data Services. Both data collection companies collected data on the same days, February 4th and 5th, 2020. Traffic data collection location maps can be found in Appendix 6.1. The traffic counts, and peak hour volume breakouts can be found in Appendix 6.3. Volume inputs were based on the collected traffic counts. Analysis of historical traffic counts showed an exponential growth rate of 1.2% which was used to obtain future year traffic volumes. Historic traffic counts can also be found in Appendix 6.3 and a summary of historic count station growth rates on the corridor is shown below in Table 1. MAXTIME data was used to obtain existing signal timing information.

Table 1: Historic Count Station Growth Rates

GDOT Count Station	Growth Rate
Between Talbotton Road and 20 th Street	0.20%
Between 26 th Street and 27 th Street	2.61%
Between 32 nd Street and 35 th Street	-0.33%
Between 42 nd Street and 44 th Street	2.41%
Average	1.22%

3.2 CAPACITY ANALYSIS

Background

The HCM 6th Edition defines Level of Service (LOS) in terms of average control delay per vehicle, which is composed of initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS A indicates operations with very low average control delay, while LOS F describes operations with extremely high-average control delay. Several factors affect the controlled delay for un-signalized intersections, such as availability and distribution of gaps in the conflicting traffic stream, critical gaps, and follow-up time for a vehicle in the queue. LOS in concept is visualized in the figure below, and the various HCM LOS criteria are summarized in Table 2.

Level of Service Visualization, FDOT Quality of Service Manual



Table 2: Level of Service Criteria

Intersection Control Delay (seconds/vehicle)			
LOS	Traffic Signal	Two Way Stop	Roundabout
A	≤ 10	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15	> 10 - 15
C	> 20 - 35	> 15 - 25	> 15 - 25
D	> 35 - 55	> 25 - 35	> 25 - 35
E	> 55 - 80	> 35 - 50	> 35 - 50
F	> 80 or v/c > 1	> 50 or v/c > 1	> 50 or v/c > 1

Model Assumptions

Synchro 10.3 software, which uses HCM-based methodology, was used to analyze all study intersections. The following assumptions were made when modeling each of the following scenarios:

1. Existing Conditions

- a. Traffic data was based directly on the turning movement counts in existing year 2020
- b. Roadway geometry was based on existing aerial imagery of the corridor
- c. Signal timing was based on MAXTIME databases downloaded from the signal controllers

2. Future Year No-Build

- a. Traffic data was grown from existing year to the opening or design year by 1.22% annually assuming exponential growth to develop future year traffic
- b. Roadway geometry was based on existing aerial imagery of the corridor
- c. Signal timing was based on existing corridor cycle lengths with splits optimized

3. Future Year Build Alternatives

- a. Traffic data was grown from existing year to the opening or design year by 1.22% annually assuming exponential growth to develop future year traffic
- b. Roadway geometry for each alternative was based on the proposed design scenarios
- c. Signal timing was based on existing corridor cycle lengths with splits optimized

Design Alternatives

The following geometric design alternatives were analyzed in the capacity analysis.

Alternative 1A

- Road diet starting at 38th Street heading south to 19th Street

Alternative 1B

- Road diet starting at 35th Street heading south to 19th Street

Alternative 2

- Four-lane section remains and intersection improvements are determined, as needed, to meet LOS D.

Results

Existing Conditions

Table 3 on the following page shows the LOS and delay results for the existing condition. All signalized intersections on the corridor operate at LOS C or better in the existing condition. There were two (2) Two Way Stop Controlled (TWSC) intersections analyzed for this project at 2nd Avenue and 23rd Street and 2nd Avenue and 29th Street. These intersections both resulted in LOS F during the AM peak. During the PM peak the 23rd Street intersection resulted in LOS E while the 29th Street intersection resulted in LOS F. These TWSC analyses are based on the assumption of a uniform arrival rate in the traffic stream on the mainline and a default (non-field calibrated) critical headways of 7.5 seconds for left turns from the minor street and 7.1 seconds for right turns from the minor street. Due to the presence of signalized intersections on the corridor, mainline traffic is likely platooning more than the analysis assumes. Furthermore, actual critical headways for these movements could be lower. Both of these assumptions contribute to higher estimated delay than is likely present at these TWSC intersections.

3.2 CAPACITY ANALYSIS

Table 3: Level of Service Criteria

Intersection	Control	Direction	2020 Existing			
			AM		PM	
			LOS	Delay	LOS	Delay
2 nd Avenue at Talbotton Road/Historic Site Driveway	Signal	All Approaches	B	10.9	C	26.5
2 nd Avenue at 23 rd Street	TWSC	EB, WB	F	114.8	E	39.7
2 nd Avenue at 29 th Street	TWSC	EB, WB	F	98.6	F	146.0
2 nd Avenue at 35 th Street	Signal	All Approaches	A	3.0	A	5.8
2 nd Avenue at 38 th St**	Signal	All Approaches	B	12.5	B	13.3
2 nd Avenue at 45 th St/Manchester Expressway*	Signal	All Approaches	B	16.7	B	14.6

Signal Warrant Screening

A signal warrant screening analysis was conducted for all 2027 Opening Year Build Alternatives and 2047 Design Year Build Alternatives in order to determine the feasibility of installing a traffic signal at the intersection of 2nd Avenue and 23rd Street and the intersection of 2nd Avenue and 29th Street. This analysis was done based on the GDOT Design Policy Manual Section 13.5.3, which advises the traffic engineer to use 5.6% of the projected Average Daily Traffic (ADT) as an estimate of the 8th highest traffic hour of the day. The results of this analysis can be found below in Table 4. Neither intersections were found to have met the planning level signal warrants in both opening and design years. The two intersections were analyzed as both TWSC and signalized, and the results are provided in this report.

Table 4: Planning Level Signal Warrant Results

Intersection	ADT Major Street (two way)	ADT Minor Street (one way)	5.6% of ADT Major Street (two way)	5.6% of Minor Street (one way)	Warrant 1A			Warrant 1B		
					100%	70%	56%	100%	70%	56%
2nd Ave at 23rd St / 2027	22302	558	1249	32	NO	NO	NO	NO	NO	NO
2nd Ave at 29th St / 2027	22302	433	1249	25	NO	NO	NO	NO	NO	NO
2nd Ave at 23rd St / 2047	28423	711	1592	40	NO	NO	NO	NO	NO	NO
2nd Ave at 29th St / 2047	28423	552	1592	31	NO	NO	NO	NO	NO	NO

Opening Year 2027

Opening year No Build and Build scenario results can be found in Tables 5 and 6 (page 64) for the AM and PM peak hour periods, respectively. These results show that for Alternative 1A, any lane reduction at 2nd Avenue and 35th Street will have a major impact to operations beginning in the opening year. Furthermore, at 2nd Avenue at 23rd Street and 2nd Avenue at 29th Street delay would substantially increase for side street vehicles. Again, the analysis assumptions for TWSC intersections would tend to overestimate delay on a signalized corridor such as this. However, at the levels of delay shown in Alternatives 1A and 1B a large deterioration in operations and substantial increase in delay for the side street would be expected to occur under a lane reduction from four (4) to two (2) lanes. Furthermore, the increased delay could push drivers to accept shorter gaps in the traffic stream increasing the risk for crashes at these intersections.

Design Year 2047

Design year No Build and Build scenario results can be found in Tables 5 and 6 (page 64) for the AM and PM peak hour periods, respectively. These results re-emphasize that for Alternative 1A, any lane reduction at 2nd Avenue and 35th Street will have a major impact to operations. Furthermore, at 2nd Avenue at 23rd Street and 2nd Avenue at 29th Street, delay would substantially increase for side street vehicles. Again, the analysis assumptions for TWSC intersections would tend to overestimate delay on a signalized corridor such as this. However, at the levels of delay shown in Alternatives 1A and 1B a large deterioration in operations and substantial increase in delay for the side street would be expected to occur under a lane reduction from four (4) to two (2) lanes. Furthermore, the increased delay could push drivers to accept shorter gaps in the traffic stream increasing the risk for crashes at these intersections. Under 2047 design year traffic conditions it was revealed that in the no-build scenario 2nd Avenue at 38th Street would experience deteriorated operations shown by the resulting LOS E during the AM peak. In order to improve operations to an LOS D at this intersection in the design year a southbound right turn lane would need to be added.

Signal Warrant Screening

2nd Avenue at 23rd Street and 2nd Avenue at 29th Street were evaluated under planning level signal warrant analysis previously in this report. This comparison is provided in order to determine if signalizing these intersections would enhance traffic operations at these intersections enough to make the road diet feasible. Table 7 (page 66) contains LOS and delay for the Opening Year AM Peak hour. Table 8 (page 66) contains LOS and Delay for the Opening Year PM Peak hour. Table 9 (page 66) contains LOS and Delay results for the Design Year AM Peak hour. Finally, Table 10 (page 66) contains LOS and Delay for the Design Year PM Peak hour. These tables show that installing a traffic signal at these two intersections would achieve LOS C for the PM peak for both of the road diet scenarios (Scenario 1A and 1B). However, these intersections would remain and LOS F during the AM peak of the opening year. In the design year both intersections would perform at LOS F with a signal under the road diet scenarios, albeit, with much lower delay for the side street vehicles than the TWSC scenario. Under the Alternative 2 scenario, which keeps the four-lane section in place, the traffic signal would perform at LOS B or better in the design year and LOS A or better in the opening year compared to LOS F in all years for the TWSC intersection.

Queue Lengths

Tables 11, 12 and 13 (pages 68, 69 and 70) provide the queue lengths for each of the design alternatives for the 2047 design year. These queue lengths will be considered for the design of turn lanes.

3.2 CAPACITY ANALYSIS

Table 5: AM Peak Hour LOS and Delay: 2027 Opening Year and 2047 Design Year

Intersection	Control	Direction	2027 Opening Year								2047 Design Year							
			No-Build		Build Alt 1A		Build Alt 1B		Build Alt 2		No-Build		Build Alt 1A		Build Alt 1B		Build Alt 2	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
2 nd Avenue at Talbotton Road/Historic Site Driveway	Signal	All Approaches	B	11.7	B	11.8	B	11.8	B	11.7	B	16.9	B	17.0	B	17.0	B	16.9
2 nd Avenue at 23 rd Street	TWSC	All Approaches	F	169.9	F	507.2	F	507.2	F	169.9	F	581.4	F	2012.2	F	2012.2	F	581.4
2 nd Avenue at 29 th Street	TWSC	All Approaches	F	151.2	F	303.9	F	303.9	F	151.2	F	1476.5	F	2765.5	F	2765.5	F	1476.5
2 nd Avenue at 35 th Street	Signal	All Approaches	A	3.2	F	175.4	A	3.2	A	3.2	A	3.7	F	321.1	A	3.7	A	3.7
2 nd Avenue at 38 th St**	Signal	All Approaches	B	15.4	B	15.2	B	15.2	B	15.2	E	73.9	D	54.3	D	53.7	D	53.7
2 nd Avenue at 45 th St/Manchester Expressway*	Signal	All Approaches	C	22.2	D	38.0	D	38.0	D	38.0	C	26.7	D	41.0	D	41.0	D	41.0

Table 6: PM Peak Hour LOS and Delay: 2027 Opening Year and 2047 Design Year

Intersection	Control	Direction	2027 Opening Year								2047 Design Year							
			No-Build		Build Alt 1A		Build Alt 1B		Build Alt 2		No-Build		Build Alt 1A		Build Alt 1B		Build Alt 2	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
2 nd Avenue at Talbotton Road/Historic Site Driveway	Signal	All Approaches	C	31.3	C	31.3	C	31.3	C	31.1	D	54.5	D	54.6	D	54.6	D	54.5
2 nd Avenue at 23 rd Street	TWSC	All Approaches	F	310.7	F	466.7	F	466.7	F	310.7	F	1719.0	F	2402.9	F	2402.9	F	1719.0
2 nd Avenue at 29 th Street	TWSC	All Approaches	F	362.5	F	453.9	F	453.9	F	362.5	F	1868.9	F	2432.1	F	2432.1	F	1868.9
2 nd Avenue at 35 th Street	Signal	All Approaches	A	6.4	E	69.3	A	6.4	A	6.4	A	9.6	F	168.6	A	9.6	A	9.6
2 nd Avenue at 38 th St**	Signal	All Approaches	B	15.5	B	14.9	B	15.5	B	15.5	C	24.7	C	21.1	C	24.6	C	24.6
2 nd Avenue at 45 th St/Manchester Expressway*	Signal	All Approaches	B	19.4	D	50.2	D	50.2	D	50.2	D	41.2	D	42.5	D	42.2	D	42.2

3.2 CAPACITY ANALYSIS

Table 7: AM Peak Hour LOS and Delay: 2027 Opening Year TWSC vs Signalized

Intersection	Control	Direction	2027 Opening Year											
			Build Alt 1A Unsignalized		Build Alt 1A Signalized		Build Alt 1B Unsignalized		Build Alt 1B Signalized		Build Alt 2 Unsignalized		Build Alt 2 Signalized	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
2 nd Avenue at 23rd Street	TWSC/Signal	EB, WB/ All Approaches	F	507.2	F	114.9	F	507.2	F	114.9	F	169.9	A	1.5
2 nd Avenue at 29 th Street	TWSC/Signal	EB, WB/ All Approaches	F	303.9	F	138.1	F	303.9	F	147.2	F	151.2	A	4.8

Table 8: PM Peak Hour LOS and Delay: 2027 Opening Year TWSC vs Signalized

Intersection	Control	Direction	2027 Opening Year											
			Build Alt 1A Unsignalized		Build Alt 1A Signalized		Build Alt 1B Unsignalized		Build Alt 1B Signalized		Build Alt 2 Unsignalized		Build Alt 2 Signalized	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
2 nd Avenue at 23rd Street	TWSC/Signal	EB, WB/ All Approaches	F	466.7	C	30.2	F	466.7	C	30.2	F	310.7	A	2.5
2 nd Avenue at 29 th Street	TWSC/Signal	EB, WB/ All Approaches	F	453.9	C	25.3	F	453.9	C	25.9	F	362.5	A	2.8

Table 9: AM Peak Hour LOS and Delay: 2047 Design Year TWSC vs Signalized

Intersection	Control	Direction	2047 Design Year											
			Build Alt 1A Unsignalized		Build Alt 1A Signalized		Build Alt 1B Unsignalized		Build Alt 1B Signalized		Build Alt 2 Unsignalized		Build Alt 2 Signalized	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
2 nd Avenue at 23rd Street	TWSC/Signal	EB, WB/ All Approaches	F	2012.2	F	263.6	F	2012.2	F	263.6	F	581.4	A	1.5
2 nd Avenue at 29 th Street	TWSC/Signal	EB, WB/ All Approaches	F	2765.5	F	282.1	F	2765.5	F	283.9	F	1476.5	B	12.2

Table 10: PM Peak Hour LOS and Delay: 2047 Design Year TWSC vs Signalized

Intersection	Control	Direction	2047 Design Year											
			Build Alt 1A Unsignalized		Build Alt 1A Signalized		Build Alt 1B Unsignalized		Build Alt 1B Signalized		Build Alt 2 Unsignalized		Build Alt 2 Signalized	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
2 nd Avenue at 23rd Street	TWSC/Signal	EB, WB/ All Approaches	F	2402.9	F	113.2	F	2402.9	F	113.2	F	1719.0	A	3.5
2 nd Avenue at 29 th Street	TWSC/Signal	EB, WB/ All Approaches	F	2432.1	F	115.9	F	2432.1	F	116.6	F	1868.9	A	3.4

3.2 CAPACITY ANALYSIS

Table 11: Queue Lengths, 2047 Design Year Alternative 1A

#	Intersection	Queue (feet)		Recommended Queue for Calculating Storage (feet)
		Unsignalized Intersections Scenario		
		AM Peak	PM Peak	
1	2 nd Ave at Talbotton Rd/Historic Site Dwy			
	Westbound Left	130	115	130
	Southbound Left	565	190	565
2	2 nd Ave at 23 rd St			
	Westbound Left/Thru	50	125	125
	Westbound Right	25	125	125
	Northbound Left	25	25	25
	Southbound Left	25	25	25
3	2 nd Ave at 29 th St			
	Northbound Left	25	25	25
	Southbound Left	25	25	25
4	2 nd Ave at 35 th St			
	Northbound Left	25	25	25
	Southbound Left	25	40	40
5	2 nd Ave at 38 th St			
	Northbound Left	25	25	25
	Southbound Left	25	30	30
6	2 nd Ave at 45 th St/Manchester Expwy			
	Westbound Right	25	535	535
	Northbound Right	25	145	145
	Southbound Left	250	325	325

Table 12: Queue Lengths, 2047 Design Year Alternative 1B

#	Intersection	Queue (feet)		Recommended Storage (feet)
		Unsignalized Intersections Scenario		
		AM Peak	PM Peak	
1	2 nd Ave at Talbotton Rd/Historic Site Dwy			
	Westbound Left	125	100	125
	Southbound Left	575	200	575
2	2 nd Ave at 23 rd St			
	Westbound Left/Thru	50	125	125
	Westbound Right	25	125	125
	Northbound Left	25	25	25
	Southbound Left	25	25	25
3	2 nd Ave at 29 th St			
	Northbound Left	25	25	25
	Southbound Left	25	25	25
4	2 nd Ave at 35 th St			
	Northbound Left	25	25	25
	Southbound Left	25	35	35
5	2 nd Ave at 38 th St			
	Northbound Left	25	25	25
	Southbound Left	25	30	30
6	2 nd Ave at 45 th St/Manchester Expwy			
	Westbound Right	60	535	535
	Northbound Right	60	150	150
	Southbound Left	530	325	530

3.2 CAPACITY ANALYSIS

Table 13: Queue Lengths, 2047 Design Year Alternative 2

#	Intersection	Queue (feet)		Recommended Storage (feet)
		Unsignalized Intersections Scenario		
		AM Peak	PM Peak	
1	2 nd Ave at Talbotton Rd/Historic Site Dwy			
	Westbound Left	130	95	130
	Southbound Left	570	195	570
2	2 nd Ave at 23 rd St			
	Westbound Left/Thru	25	100	100
	Westbound Right	25	25	25
	Northbound Left	25	25	25
	Southbound Left	25	25	25
3	2 nd Ave at 29 th St			
	Northbound Left	25	25	25
	Southbound Left	25	25	25
4	2 nd Ave at 35 th St			
	Northbound Left	25	25	25
	Southbound Left	25	45	45
5	2 nd Ave at 38 th St			
	Northbound Left	25	25	25
	Southbound Left	25	30	30
6	2 nd Ave at 45 th St/Manchester Expwy			
	Westbound Right	60	535	535
	Northbound Right	45	145	145
	Southbound Left	530	325	530

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3.3 DIVERSION SENSITIVITY ANALYSIS

Background

In order to assess the potential for a road diet, an analysis was conducted to determine the potential effects a road/lane diet would have on existing traffic and also determine how much traffic would need to divert to other routes, if needed, in order to meet LOS D. This was done by first removing a through lane from 2nd Avenue at all intersections in the study, under existing year traffic, and recording their LOS and delay. Then, through traffic at each intersection was incrementally reduced in 5% increments until the intersection LOS was D or better.

Intersection Analysis

Table 14 and Table 15 below show the intersection LOS and delay for the diversion sensitivity analysis. These tables provide “Existing” results, “Existing with Lane Diet” results, and “Lane Diet with Diversion” results as well as the “Diversion Level Used”. In this context, “Existing” results are based on existing year traffic with existing roadway geometry. “Existing with Lane Diet” results are based on existing year traffic with roadway geometry matching existing except with one through lane removed in each direction. “Lane Diet with Diversion” results are based on existing geometry with one lane removed and existing traffic volume with a reduction in through traffic to the level required in order to meet LOS D. Finally, the “Diversion Level” shows the percentage of through traffic reduced in order to meet LOS D and which movement this traffic reduction was taken from.

These results show that during the AM peak, in the existing year, there would need to be a 30% reduction in southbound through traffic at 2nd Avenue and 38th Street in order for a road/lane diet to be viable. Furthermore, for at the same intersection during the PM peak, a reduction in northbound through traffic of 15% would be required in order for the lane diet to be viable.

Table 14: AM Peak Hour Road Diet Sensitivity Results

AM Peak / Intersection	Existing		Existing with Lane Diet		Lane Diet with Diversion		Diversion Level	
	LOS	Delay	LOS	Delay	LOS	Delay	Movement	Percent Reduced
2nd Ave at Manchester Expwy	A	7.5	E	68.1	D	49.9	SB Thru	10%
2nd Ave at 38th St	B	16.7	F	187.1	D	47	SB Thru	30%
2nd Ave at 35th St	A	3	F	122.3	D	50.3	SB Thru	15%
2nd Ave at Talbotton	A	7.5	B	17.8	B	17.8	No Reduction	No Reduction

Table 15: PM Peak Hour Road Diet Sensitivity Results

PM Peak / Intersection	Existing		Existing with Lane Diet		Lane Diet with Diversion		Diversion Level	
	LOS	Delay	LOS	Delay	LOS	Delay	Movement	Percent Reduced
2nd Ave at Manchester Expwy	A	14.6	D	44.3	D	44.3	No Reduction	No Reduction
2nd Ave at 38th St	B	13.3	F	95.2	D	40.8	NB Thru	15%
2nd Ave at 35th St	A	5.8	D	41.4	D	41.4	No Reduction	No Reduction
2nd Ave at Talbotton	A	8.9	B	17.6	B	17.6	No Reduction	No Reduction

Segment Analysis

After completing the diversion sensitivity analysis at each intersection, the resulting scenarios were then used to analyze Arterial Level of Service results from synchro. This analysis estimates arterial speeds through the corridor (taking into account delay incurred at signalized intersections) and determines LOS based on the ratio of the estimated speed to the free slow speed (based on the speed limit in this case).

Tables 16, 17, 18 and 19 on the following page show the Arterial LOS for each direction and each scenario from the intersection diversion sensitivity analysis.

During the AM peak period, it is shown that for southbound traffic from north of Manchester Expressway to 35th Street a road diet would cause speeds to decrease approximately 20 mph and result in LOS F in the existing scenario. With the diversions in place from the intersection analysis the segment analysis indicates there would still be deteriorated LOS north of Manchester Expressway and between 38th Street and 35th Street resulting in LOS E and F, respectively.

During the PM peak period, the road diet would cause significant deterioration in the northbound direction between 35th Street and 38th Street resulting in LOS F. This LOS F persists even with the assumed 15% diversion in traffic from the intersection diversion sensitivity analysis.

3.3 DIVERSION SENSITIVITY ANALYSIS

Table 16: Northbound AM Peak Arterial LOS Road Diet Sensitivity Results

Northbound AM		Existing			Existing with Lane Diet			Lane Diet with Diversion		
From	To	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS
Begin	Talbotton Rd	21.8	15.7	D	34.3	17.7	D	33.3	18.2	C
Talbotton Rd	35th St	110	34.5	A	110.3	34.3	A	110.3	34.3	A
35th St	38th St	27.5	21.9	C	30.7	19.5	C	30.7	19.5	C
38th St	Manchester Expwy	103.1	20	C	83.5	24.8	B	89.8	23	C
Overall		Total: 262.4	Average: 25.9	B	Total: 258.8	Average: 27.3	B	Total: 264.1	Average: 26.7	B

Table 17: Southbound AM Peak Arterial LOS Road Diet Sensitivity Results

Southbound AM		Existing			Existing with Lane Diet			Lane Diet with Diversion		
From	To	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS
Begin	Manchester Expwy	28.8	23.8	C	100.8	8.3	F	59.6	14.1	E
Manchester Expwy	38th St	69.4	29.7	B	259.8	8	F	97.5	21.2	D
38th St	35th St	24.8	24.2	C	144.7	4.1	F	67.1	8.9	F
35th St	Talbotton Rd	112	33.9	B	135.3	28	C	131.5	28.8	B
Overall		Total: 235	Average: 30.4	B	Total: 640.6	Average: 11.4	F	Total: 355.7	Average: 20.5	D

Table 18: Northbound PM Peak Arterial LOS Road Diet Sensitivity Results

Northbound PM		Existing			Existing with Lane Diet			Lane Diet with Diversion		
From	To	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS
Begin	Talbotton Rd	27	12.7	E	53.7	11.3	E	53.7	11.3	E
Talbotton Rd	35th St	114.1	33.2	A	149.7	25.3	B	149.7	25.3	B
35th St	38th St	31.4	19.2	C	144.9	4.1	F	64.1	9.3	F
38th St	Manchester Expwy	107.2	19.2	C	90.3	22.9	C	90.3	22.9	C
Overall		Total: 279.7	Average: 24.3	B	Total: 438.6	Average: 16.1	D	Total: 357.8	Average: 19.7	C

Table 19: Southbound PM Peak Arterial LOS Road Diet Sensitivity Results

Southbound PM		Existing			Existing with Lane Diet			Lane Diet with Diversion		
From	To	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS	Travel Time	Arterial Speed	Arterial LOS
Begin	Manchester Expwy	35.5	19.3	D	29.4	28.5	B	29.4	28.5	B
Manchester Expwy	38th St	66.9	30.8	B	70.2	29.5	B	70.2	29.5	B
38th St	35th St	22.6	26.6	C	22.7	26.3	C	22.7	26.3	C
35th St	Talbotton Rd	112.2	33.8	B	111.4	34	B	111.4	34	B
Overall		Total: 237.2	Average: 30.1	B	Total: 233.7	Average: 31.2	B	Total: 233.7	Average: 31.2	B

3.4 PEDESTRIAN EVALUATION

Several locations along 2nd Avenue were identified as being candidates for consideration of pedestrian crossings due to land use, origins and destinations, and observed pedestrian crossings in these areas. Appendix 6.2 includes the study used to determine the viability, the need and location of mid-block pedestrian crossings along the study corridor.

The study recommends an RRFB to be considered at the following locations due to the observed pedestrian crossing activity and the pedestrian fatality observed in the last five years:

- 2nd Avenue between 20th Street and 21st Street near the Metra bus stop.
- 2nd Avenue between 24th Street and 25th Street between the Metra bus stops.
- 2nd Avenue between 43rd Street and 44th Street at the Bridge Church

The study also recommends considering a PHB along 2nd Avenue between 29th Street and 30th Street as this location has the highest pedestrian activity among the studied locations and meets the GDOT-recommended pedestrian volume thresholds to add a mid-block pedestrian crossing.

There are no pedestrian refuge islands along the study section. One of the recommended treatments along this section of the study corridor would be to consider medians to provide pedestrian refuge for midblock crossings along 2nd Avenue.



Rectangular Rapid Flashing Beacon (RRFB)



Pedestrian Hybrid Beacons (PHB)



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Conclusions

The study team has performed a traffic analysis for three potential design alternatives the SR 85/2nd Avenue corridor between Manchester Expressway and Talbotton Road. Furthermore, a diversion sensitivity analysis has been conducted to investigate the level of diversion that would be necessary in the existing year for a road diet to be considered feasible. Based on the high delay that the road diet would incur at several intersections and the high level of traffic diversion necessary in order for the road diet to be considered feasible, a road diet is not recommended for this corridor. Therefore, Alternative 2, the four-lane alternative, is recommended as it maintains a LOS D at all signalized intersections and has the least impact to TWSC intersection operations along the corridor.

3.5 PEDESTRIAN INTENSITY HEAT MAP

6:00 AM TO 6:00 PM



LEGEND

Pedestrian Counts (Quantity)

3 - 9

10 - 19

20 - 35

36 - 82

Project Limits

METRA Stops

78 TRANSPORTATION SYSTEM ANALYSIS | City of Columbus

2nd Avenue Streetscape Study | TRANSPORTATION SYSTEM ANALYSIS 79

3.5 PEDESTRIAN PEAK HOUR HEAT MAP

6:00 AM TO 9:00 AM, 3:00 PM TO 6:00 PM



LEGEND

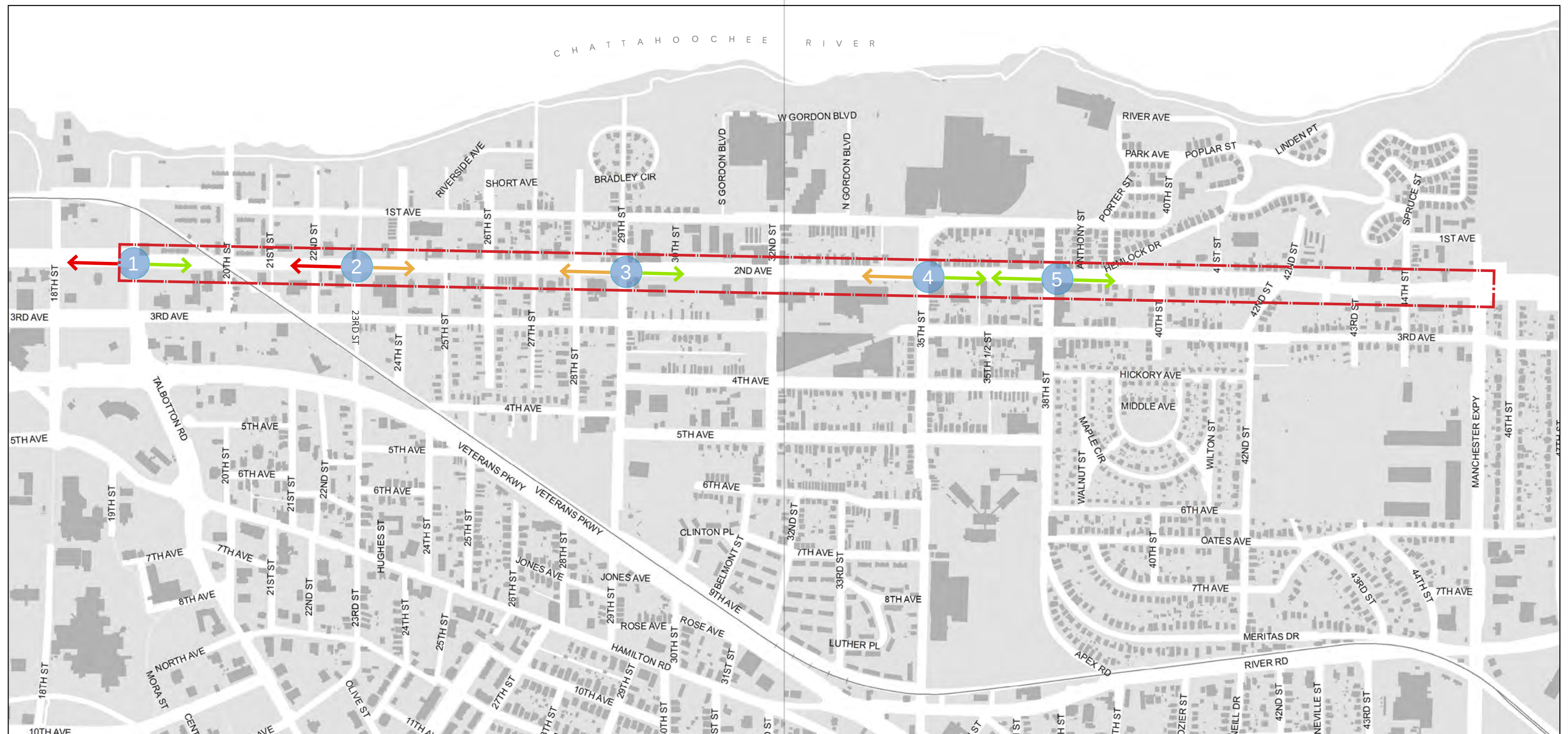
Pedestrian Counts (Quantity)

- 30 - 50
- 51 - 70
- 71 - 90
- Project Limits
- METRA Stops



3.5 BIKE PEAK HOUR HEAT MAP

6:00 AM TO 9:00 AM, 3:00 PM TO 6:00 PM



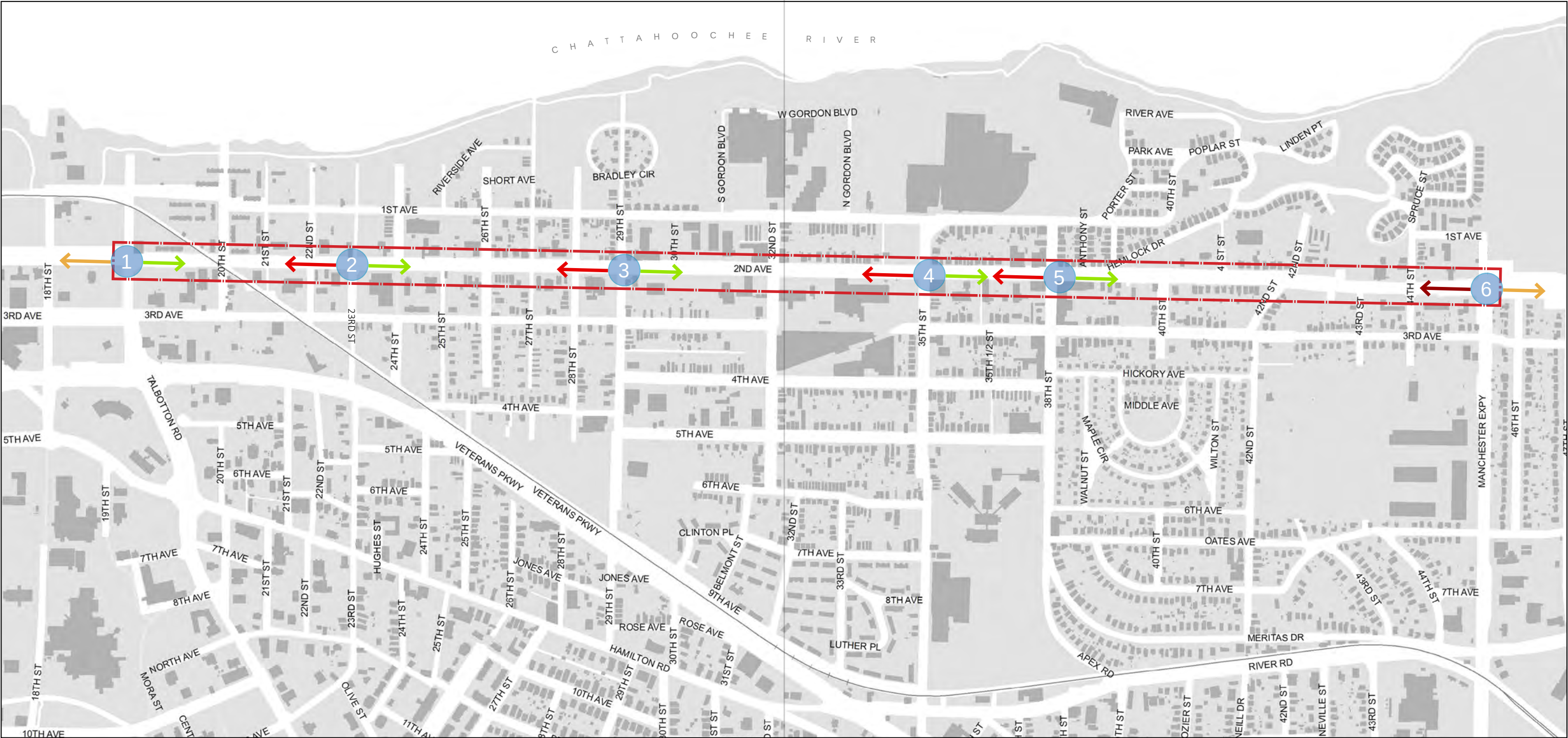
LEGEND

Bike Counts (Quantity)



3.5 AUTOMOBILE AM PEAK HOUR HEAT MAP

6:00 AM TO 9:00 AM



LEGEND

- Car Counts (Quantity)
- 1 - 600

601 - 1800

1801 - 3000

3001 - 3600

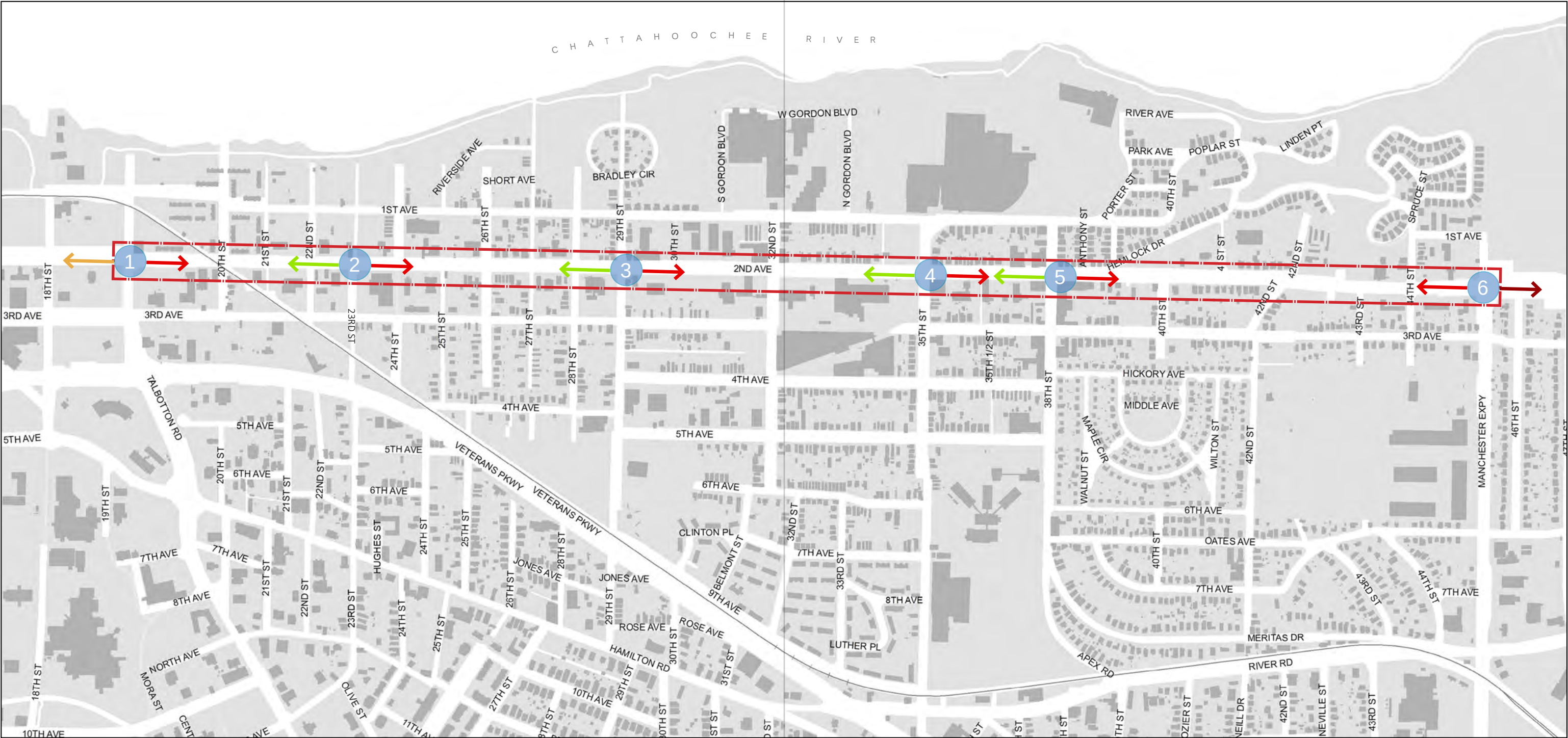
Project Limits

Traffic Count Locations



3.5 AUTOMOBILE PM PEAK HOUR HEAT MAP

3:00 PM TO 6:00 PM



LEGEND

Car Counts (Quantity)

- 1 - 600
- 601 - 1400
- 1401 - 2200
- 2201 - 4000
- Project Limits
- Traffic Count Locations



3.6 SIDEWALK ZONES



	Frontage Zone	Pedestrian Circulation Zone	Greenscape / Furniture Zone	Curb Zone
Urban Core	2 - 10'	10 - 12'	4 - 6'	6"
Urban	2 - 10'	8 - 10'	4 - 8'	6"
Suburban	2 - 10'	6 - 8'	4 - 10'	6"
Rural Town	2 - 10'	5 - 8'	4 - 6'	6"

“Creating a street that provides a comfortable environment for pedestrians requires going beyond minimum sidewalk infrastructure requirements, such as a 5-foot-wide sidewalk. While the addition of streetscape components may enhance the pedestrian-friendly character of a street, they may also obstruct access and create tripping hazards if not planned for carefully. To provide a functional and inviting pedestrian route, designers should conceptualize the sidewalk as a composition of three zones. Dividing the sidewalk into zones will help practitioners and designers organize streetscape components and result in adequate space for the intended activities. The three sidewalk zones discussed are the frontage zone, pedestrian circulation zone, and greenscape/furniture zone. Although there is no physical boundary between these zones, each area has an optimal range of widths, as depicted on the figure above, to accommodate a mix of streetscape components. The width of each zone varies based on the pedestrian activity, adjacent building uses, roadway and traffic characteristics, and desired character.”

—— GDOT Pedestrian and Streetscape Guide (2019)



Frontage Zone

“The frontage zone is the space connecting the adjacent property line to the pedestrian access route. Adjacent property use influences the type of activities that occur in the frontage zone and, in turn, the width and organization of streetscape components in this zone.”



Pedestrian Circulation Zone

“The pedestrian circulation zone is the portion of the sidewalk reserved for pedestrian travel. Like the frontage zone, the width of the pedestrian circulation zone should respond to the existing or anticipated volume of pedestrian activity.”



Greenscape/Furniture Zone

4 feet minimum from face of curb to center of tree trunk on a low speed street of 35 mph or less

“The greenscape/furniture zone is the space between the pedestrian circulation path and the curb. This zone serves as a buffer between pedestrians on the sidewalk and vehicles on the street, and is reserved for signs, light and utility poles, seating, bicycle parking, transit stops, trash receptacles, trees, plants, and green stormwater infrastructure.”



Greenscape Zone



Furniture Zone

3.7 ACTIVE TRAVEL - DOWNTOWN BICYCLE NETWORK

The 21st century will be defined by multi-modality. Whereas the 20th century was the age of the automobile, it is now time to augment America’s well-built motor vehicle system with infrastructure that supports a wide variety of transportation options. This will become increasingly necessary as more people move into urban areas. Cities will have two choices. The first option is to widen the roadways, but this can be incredibly expensive, can divide communities, and only entrenches our reliance on the automobile. Furthermore, once demand reaches another threshold, the city will have to widen the road again, or widen another road - it never ends. The second option is to build facilities such as sidewalks, bike paths, and bus lanes that allow people to choose the mode that works best for their needs at any given time. When people are given the choice between multiple safe and comfortable alternatives, the demand will tend to reach an equilibrium amongst the modes. In other words, instead of being forced to regularly create a bigger system to meet greater demand, we can create a system that dynamically reacts to demand and spreads it across many modes of transportation to manageable levels. This principle is known as resiliency, and it is one of the three pillars of sustainability.



With that said, 2nd Avenue presents a variety of characteristics that make it unsuitable for bicycle facilities. The chief among these reasons is the high volume of traffic that the corridor experiences on a daily basis. 2nd Avenue is the main route for people exiting the highway from the north to get into the downtown area. This is especially true for commuters to the TSYS building south of the study area, which is one of Columbus’s largest employers. As discussed in the traffic analysis section of this document, this high volume of traffic precludes the possibility of a road diet. In other words, the constraint is that any cross section of the corridor must include two travel lanes in each direction, which limits the right-of-way that can be allocated to other infrastructure. In conjunction with this, the high volume of traffic and high vehicle speeds would necessitate a protected or separated bicycle facility. Such facilities require more roadway width than a basic bike lane. Ultimately, there are opportunity costs that have to be considered.

The untapped potential with 2nd Avenue is as the northern gateway into uptown Columbus. The goal is for people to exit the highway and the expressway and know they have arrived at a beautiful place. In pursuit of that goal, right-of-way along 2nd Avenue would be put to better use by allocating it to inviting streetscape elements that attract economic development. These elements include wide sidewalks, street trees, and a landscaped median. The proportions of each of these elements to each other are incredibly important to the language of the streetscape. By changing the proportion of any one of these elements, that natural language is disrupted, and the once attractive streetscape can become jarring and uninviting.



Considering bicycle needs in the area, the following pages outline a detailed bicycle network for the downtown area. A lack of bike facilities on 2nd Avenue is alleviated by the existence of the Riverwalk and 1st Avenue within the two blocks to the west. The Riverwalk is Columbus’ treasured trail that follows the Chattahoochee River, and 1st Avenue is a quiet, low-volume street that would serve perfectly as a bicycle boulevard. Both of these facilities serve the north-south role well, rendering a facility on 2nd Avenue redundant. Furthermore, numerous east-west connections across 2nd Avenue maintain a level of permeability for bicyclists to access businesses as economic development comes to the corridor.

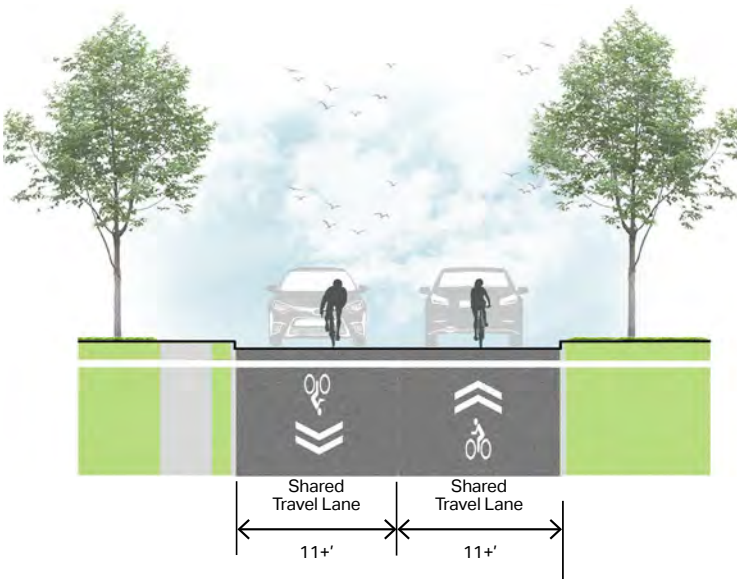
3.7 ACTIVE TRAVEL - INFRASTRUCTURE SELECTION

Downtown Columbus is a grid design with neighborhood streets, which provides bicyclists many options for their route. Bicycle boulevards are the most common recommendation for the downtown bicycle network because they harness what makes these neighborhood streets ideal for bicycle movement and augment those characteristics. Furthermore, they are attractive to residents because bicycle boulevards tend to slow down car traffic and route car traffic to other, faster thoroughfares. All of this can be achieved for a relatively low cost – oftentimes all that is required for a bicycle boulevard is roadway striping.

The bicycle boulevard is considered the default infrastructure type. Each road identified as an important bicycle route starts out as a bicycle boulevard. These connections are then studied in more depth to determine whether more formalization or separation is required of the bike facility. If so, the recommendation is upgraded from bicycle boulevard to the appropriate facility type.

Bike Boulevards

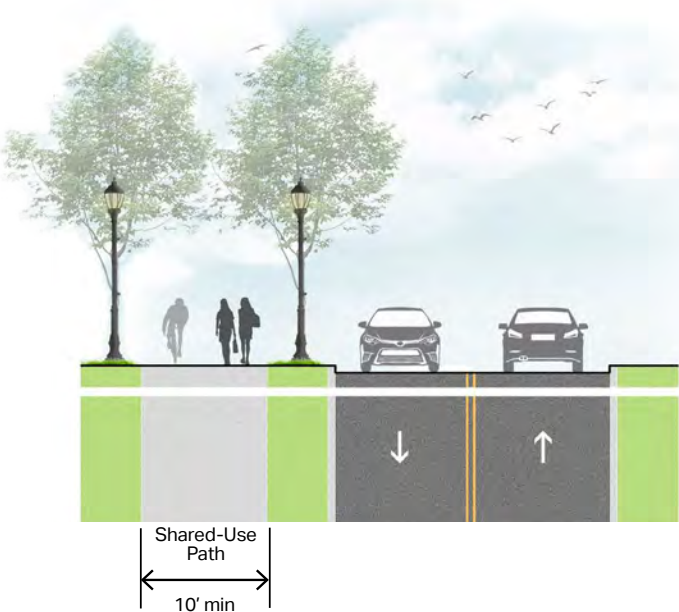
Bike boulevards are a low-impact implementation that promotes the use of local streets for bicycle travel. Local streets are perfect for bicycle travel - they are typically low-speed and low-volume in terms of motor vehicles, and often they run parallel to more hostile thoroughfares. By installing sharrows to indicate that bicyclists belong in the road and wayfinding signage to make the route clear, these are great low-cost additions to round out the network of more costly infrastructure options.



The beauty of bike boulevards is that they are a flexible implementation that can change based on the street itself and the desires of people living on the street. All that is required at minimum is the application of sharrows at regular intervals and signage indicating that bicycles are welcome and should mingle with motor vehicle traffic. Wayfinding signage goes a long way to making a street inviting for bicyclists. It also ties the street to the greater whole, better defining a sense of place. There are streets that require more intervention. In such cases, traffic calming measures such as speed humps and volume control measures such as diverters are instrumental. However, more detailed engineering would be necessary to determine the appropriate implementation. Any bike boulevard recommendations in this report were made at a high-level and are only intended to include sharrows and signage.

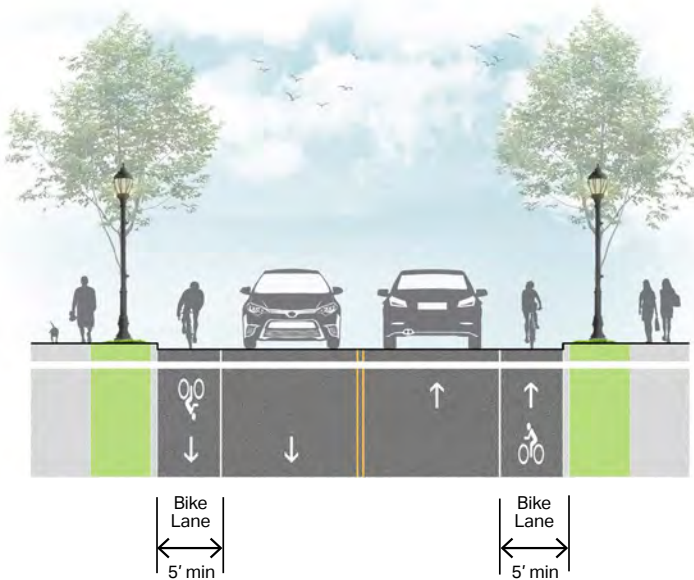
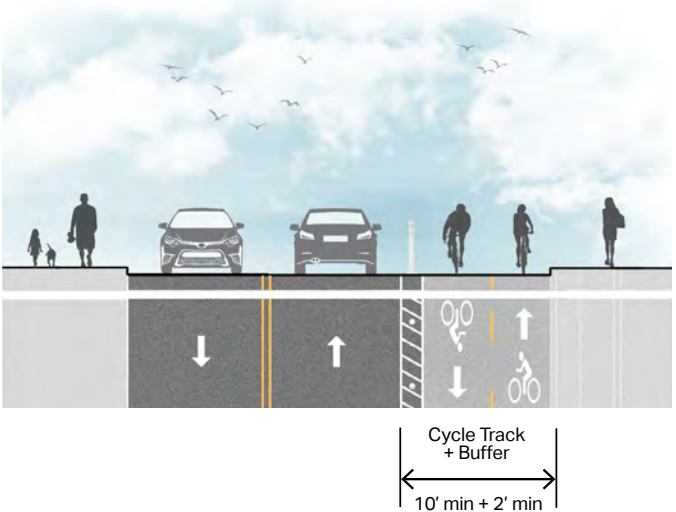
Shared-use Paths

These minimum 10' concrete paths are intended for use by pedestrians and bicyclists. Shared-use paths are great infrastructure improvements because they provide pedestrians and bicyclists a facility that is completely separated from vehicular traffic. They also often provide great economic benefits through increased tourism and economic development in the surrounding area. Columbus already has built many miles of great Shared-use paths such as the Azalea Trace and the Chattahoochee Riverwalk.



Cycle Tracks

A cycle track is essentially a bike lane that is separated from traffic. This separation can be achieved with as little as a 2' striped buffer and plastic bollards, but more permanent separation is preferred. The simple addition of the protected buffer to a dedicated lane for bicyclists makes people feel much more comfortable riding near vehicular traffic. Often, these can be constructed simply by rededicating a lane of traffic. Cycle tracks can be two-way (at right) or one-way pairs.



Bike Lanes

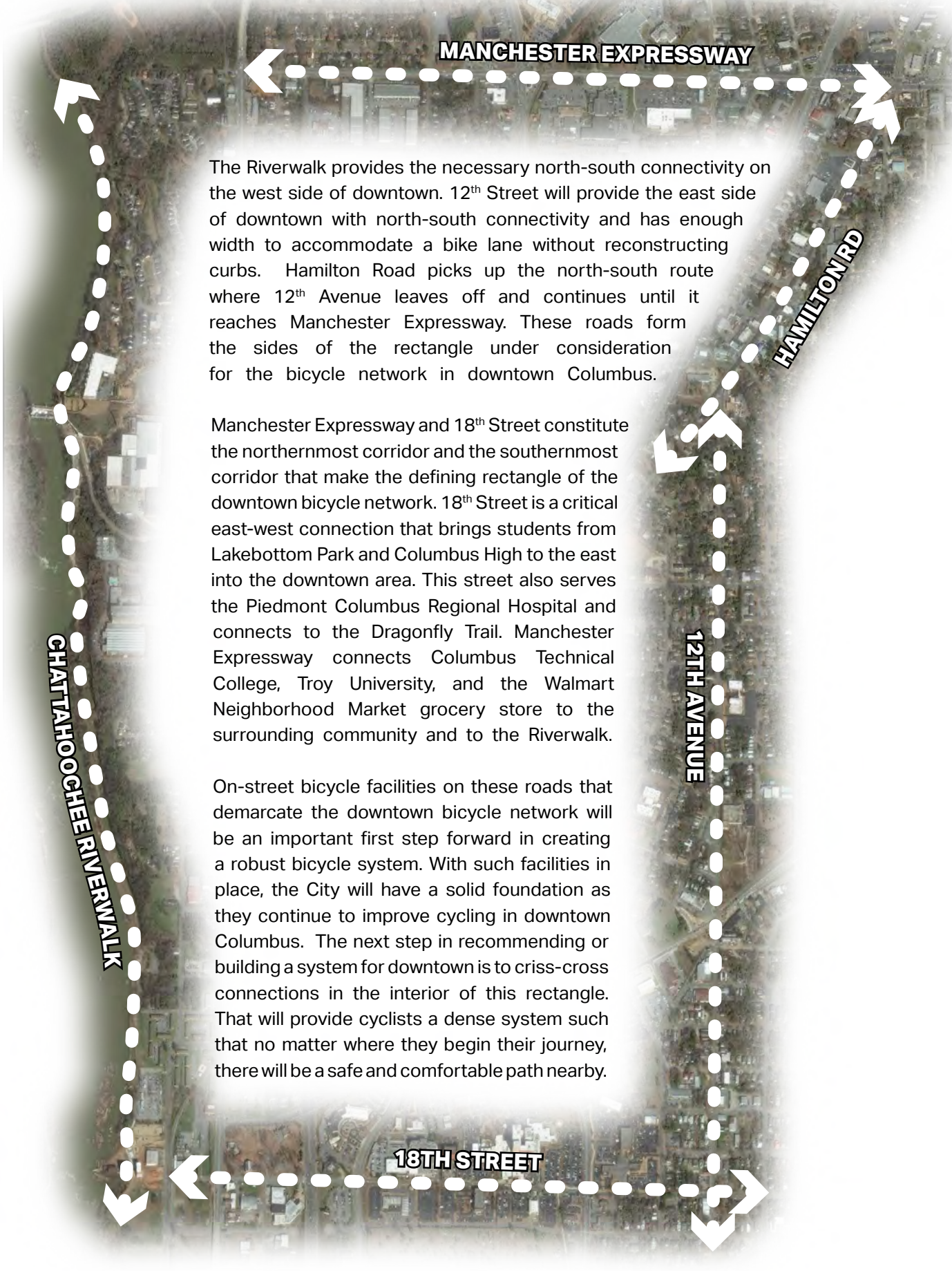
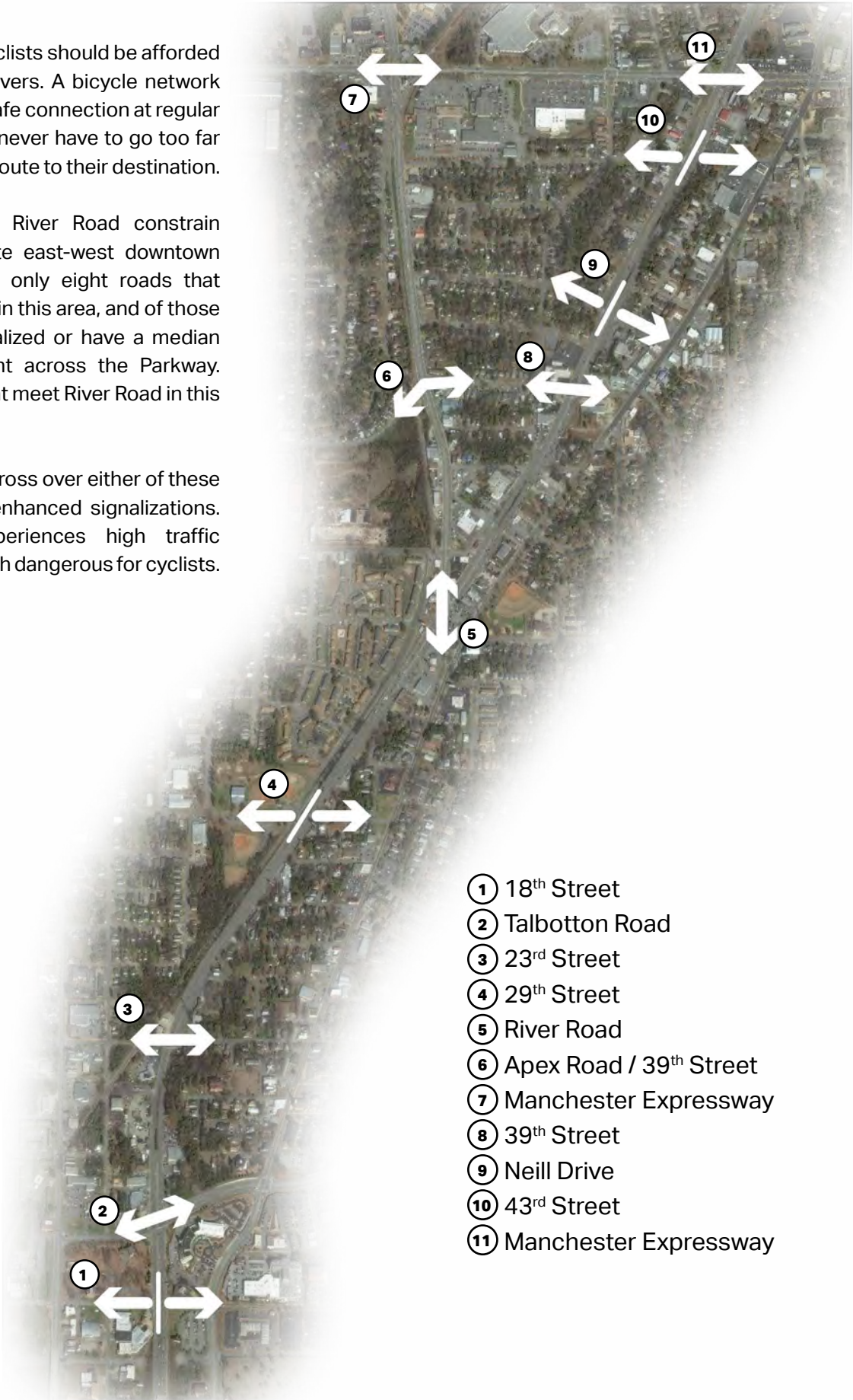
Bike lanes are the standard facility for bicycles. They are simply a 5' wide lane adjacent to the vehicle travel lanes. Although bike lanes are a widely recommended infrastructure implementation, they should really only be used in constrained conditions where a protected or separated facility is not possible. At the end of the day, the only thing separating the bikes from dangerous motor traffic is a white line.

3.7 ACTIVE TRAVEL - ROUTE CONSTRAINTS

Generally speaking, bicyclists should be afforded the same luxuries as drivers. A bicycle network should have a straight, safe connection at regular intervals to ensure they never have to go too far out of their way to find a route to their destination.

Veteran’s Parkway and River Road constrain the number of complete east-west downtown connections. There are only eight roads that cross Veterans Parkway in this area, and of those many are either unsignalized or have a median that prevents movement across the Parkway. Only two of the roads that meet River Road in this area cross over.

Any bicycle routes that cross over either of these roads will also require enhanced signalizations. Veterans Parkway experiences high traffic speeds and volumes, both dangerous for cyclists.



The Riverwalk provides the necessary north-south connectivity on the west side of downtown. 12th Street will provide the east side of downtown with north-south connectivity and has enough width to accommodate a bike lane without reconstructing curbs. Hamilton Road picks up the north-south route where 12th Avenue leaves off and continues until it reaches Manchester Expressway. These roads form the sides of the rectangle under consideration for the bicycle network in downtown Columbus.

Manchester Expressway and 18th Street constitute the northernmost corridor and the southernmost corridor that make the defining rectangle of the downtown bicycle network. 18th Street is a critical east-west connection that brings students from Lakebottom Park and Columbus High to the east into the downtown area. This street also serves the Piedmont Columbus Regional Hospital and connects to the Dragonfly Trail. Manchester Expressway connects Columbus Technical College, Troy University, and the Walmart Neighborhood Market grocery store to the surrounding community and to the Riverwalk.

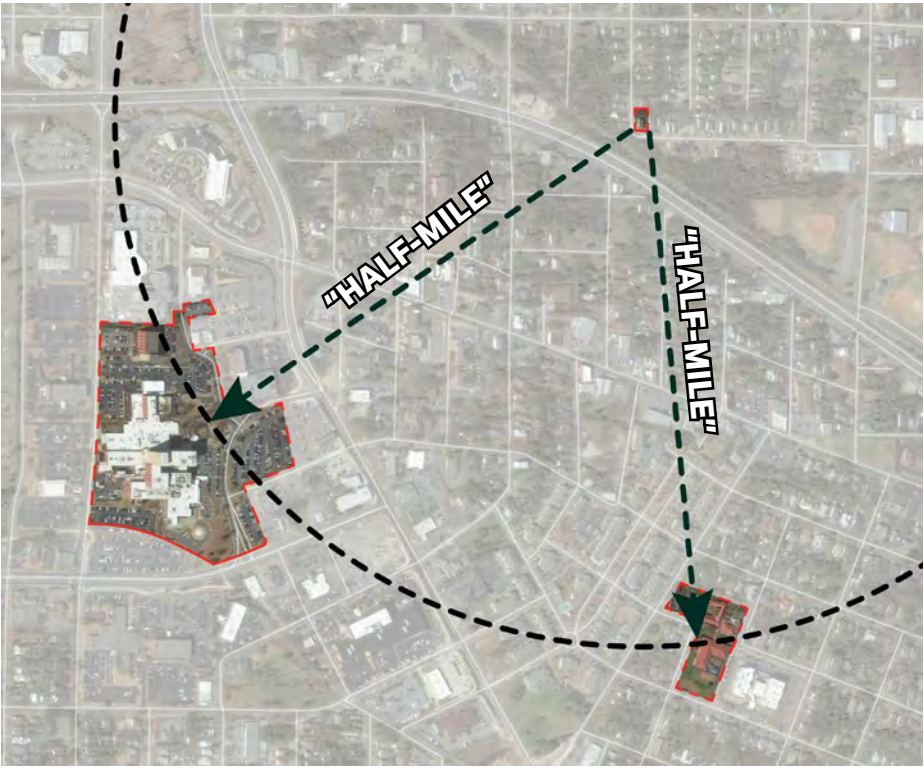
On-street bicycle facilities on these roads that demarcate the downtown bicycle network will be an important first step forward in creating a robust bicycle system. With such facilities in place, the City will have a solid foundation as they continue to improve cycling in downtown Columbus. The next step in recommending or building a system for downtown is to criss-cross connections in the interior of this rectangle. That will provide cyclists a dense system such that no matter where they begin their journey, there will be a safe and comfortable path nearby.

3.7 ACTIVE TRAVEL - CONNECTIVITY HEATMAPPING

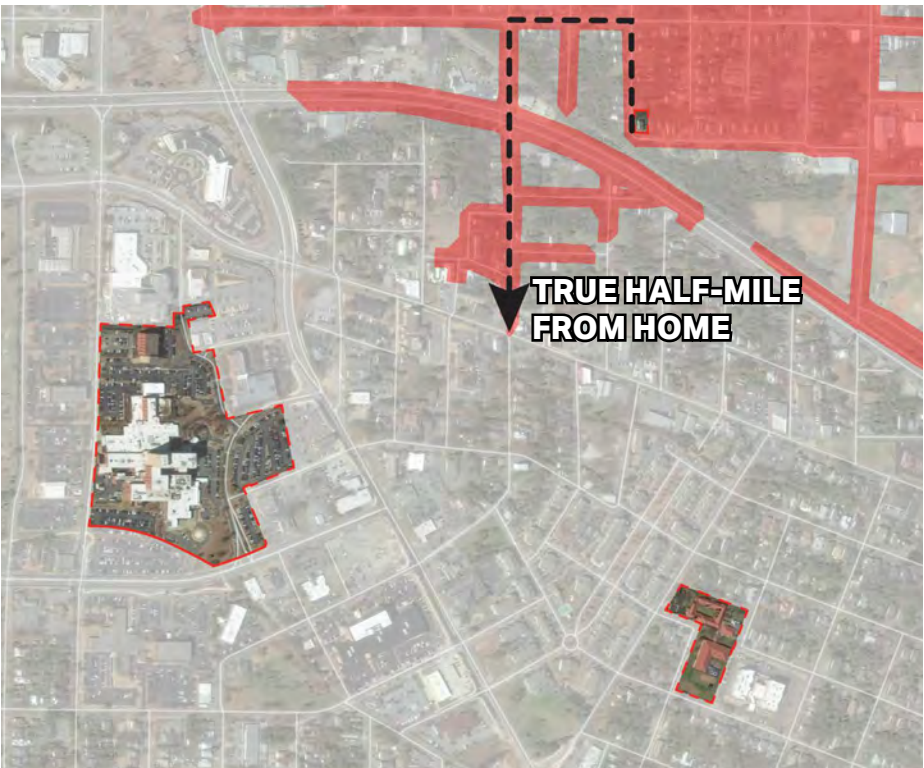
In order to assess the relative connectivity of different segments of street, the design team employed a novel methodology.



Traditionally, transportation planners draw a simple circle to describe the potential distance that you could travel from point A. The half-mile travel radius, shown at right, indicates that you could reach either of your destinations by traveling half of a mile. But this is simply not the case; unlike crows, people are bound to the transportation network. In this case, Veterans Parkway restricts the number of potential crossings, none of which are direct.



Enter the travelshed. Shaded in red at right, the travelshed delineates how far you can actually travel when you are restricted to the transportation network. This provides a far better reflection of the reality that we face.



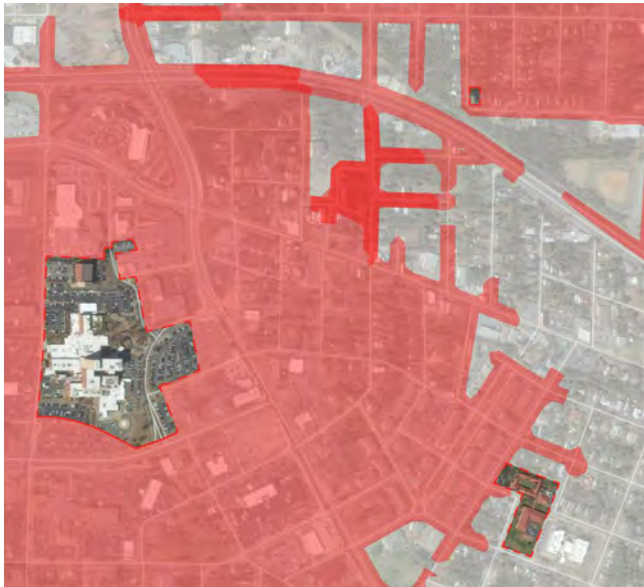
An individual travelshed is not descriptive on its own. The power of this methodology derives from overlapping many travelsheds to determine which segments of street are common amongst the places under study.

1 We create a travelshed from the home...



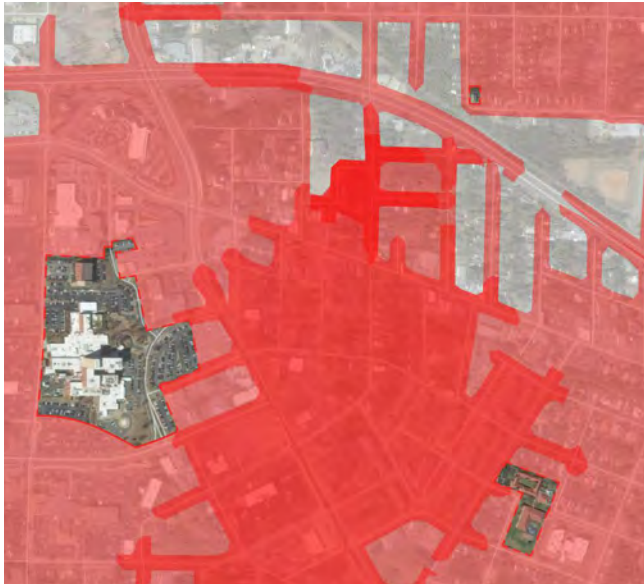
+

2 We create a travelshed from the hospital...



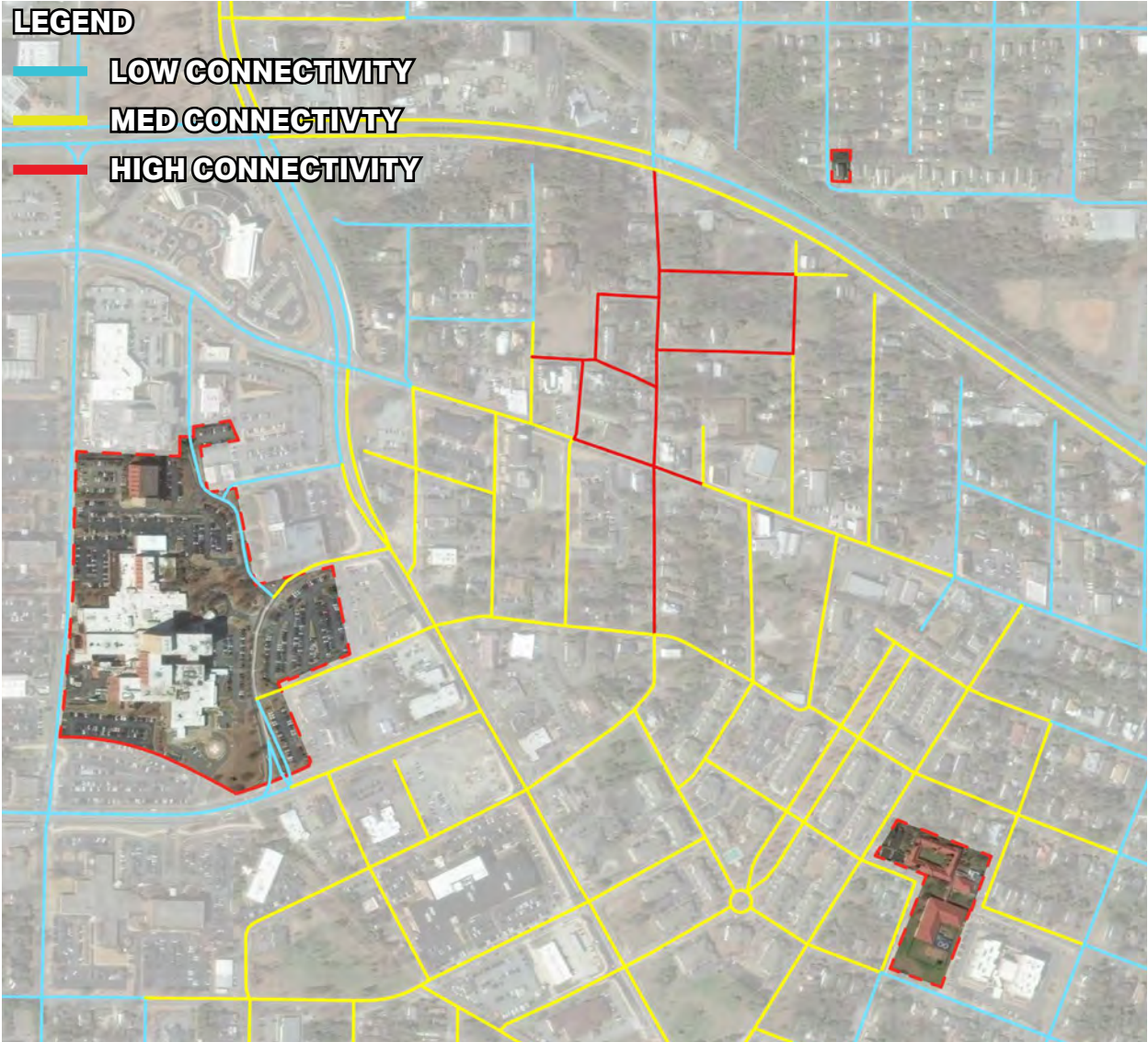
+

3 And we create a travelshed from the school...



Finally, we take each street segment and count the number of times that they are overlapped by a travelshed. This results in a map of connectivity hotspots indicated by the warmth of the colors in the map below. We can now clearly see that 23rd Street is incredibly important for connectivity between these three places. This may seem obvious, but that's because only three places were considered for this illustration. When the number of places is in the hundreds or thousands, the predictive power of this methodology becomes apparent.

=



In the pages that follow, the first is a heatmap depicting the connectivity from residential parcels. Hotter lines on this map indicate that more people living nearby are likely to use this street to get where they need to go. The second is a heatmap depicting the connectivity from destinations of interest. These destinations include schools, grocery stores, and parks. Hotter lines on this map indicate that this street segment is connective for more destinations. Finally, another set of maps is included that corresponds to Uptown Columbus. Please note that the data provided did not cover the full extent of the map area, but it was important to include all of Uptown for context.

RESIDENTIAL HEATMAP NORTH

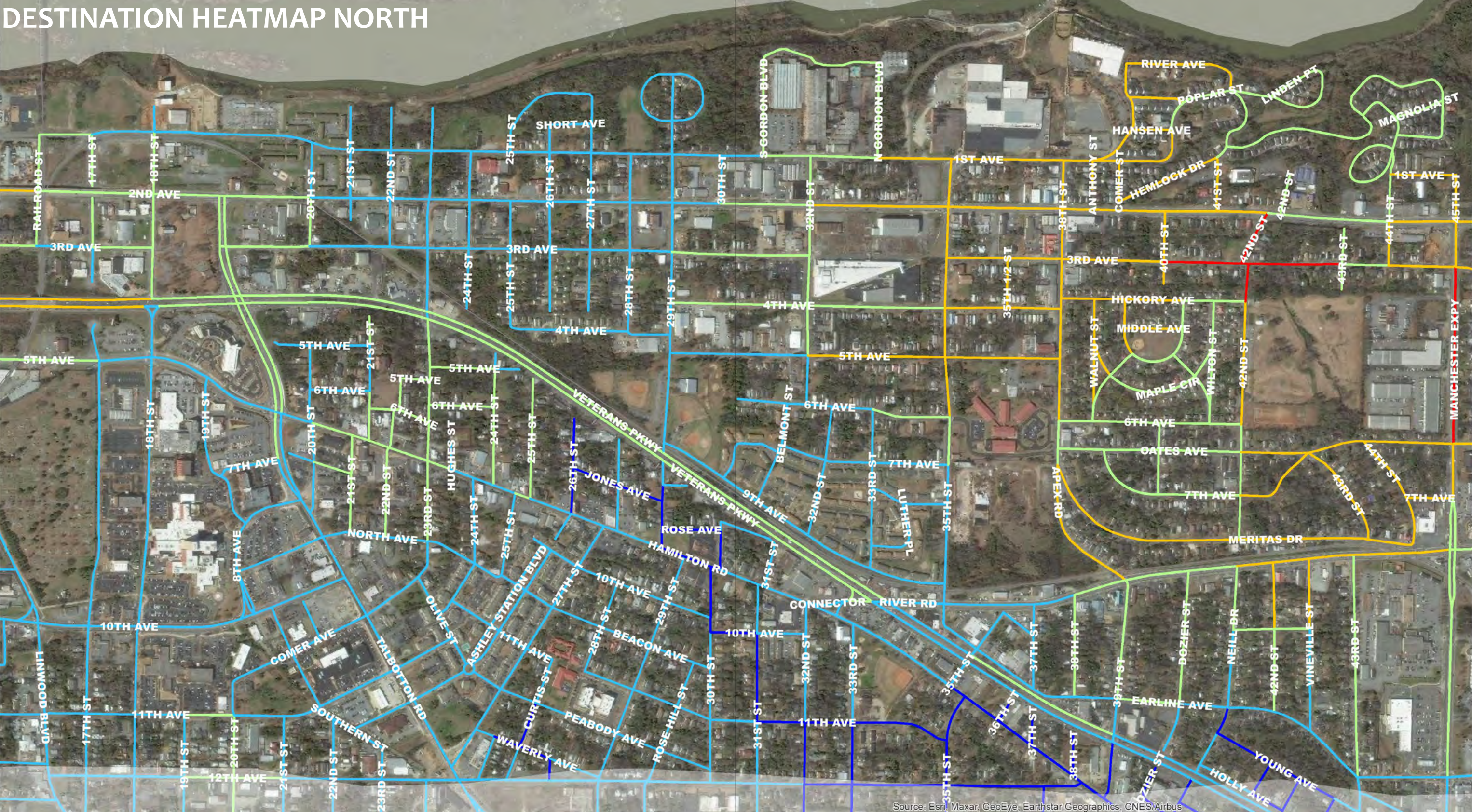


LEGEND

- Lowest Connectivity
- Low Connectivity
- Medium Connectivity
- High Connectivity
- Highest Connectivity



DESTINATION HEATMAP NORTH

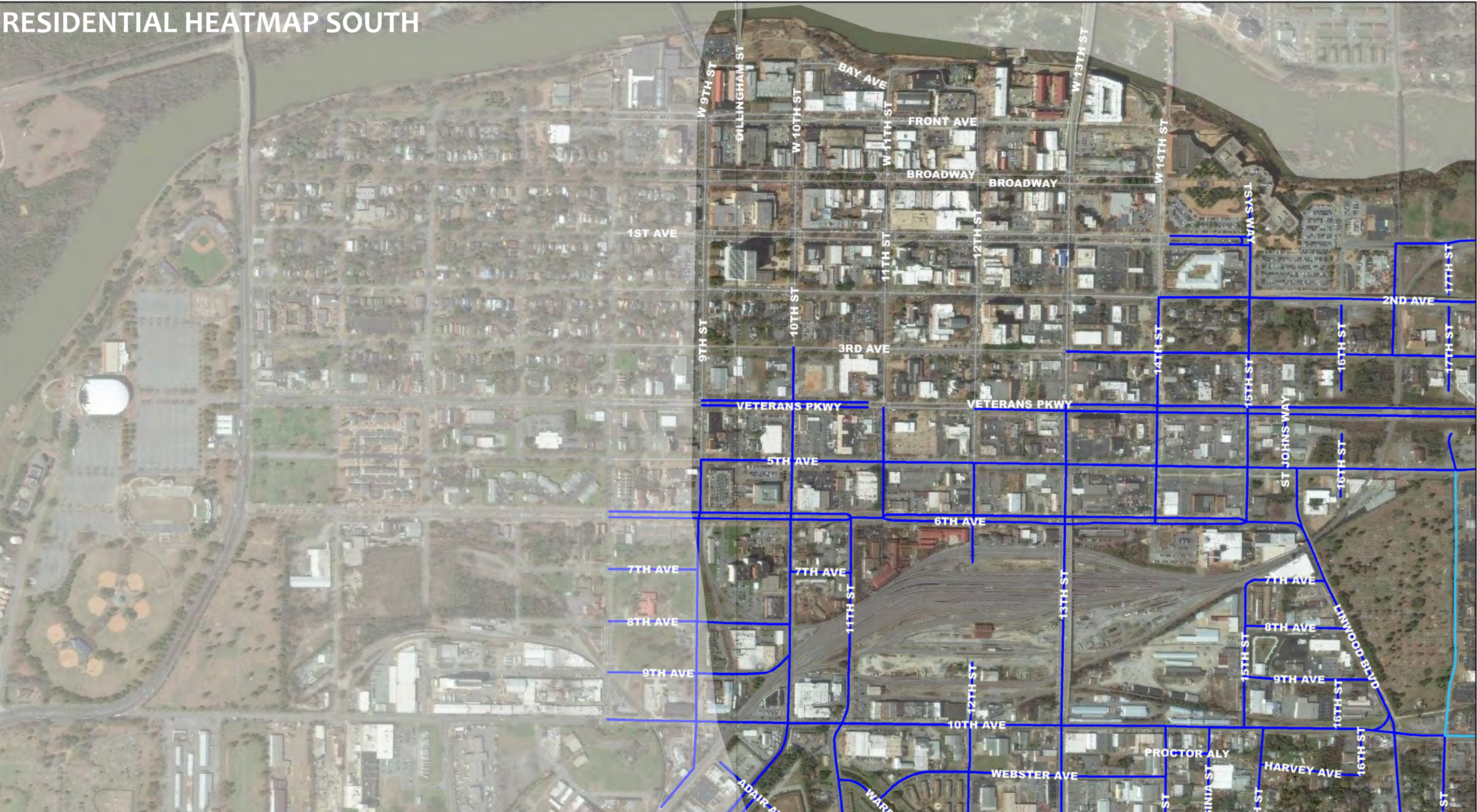


LEGEND

— Lowest Connectivity	— High Connectivity
— Low Connectivity	— Highest Connectivity
— Medium Connectivity	



RESIDENTIAL HEATMAP SOUTH

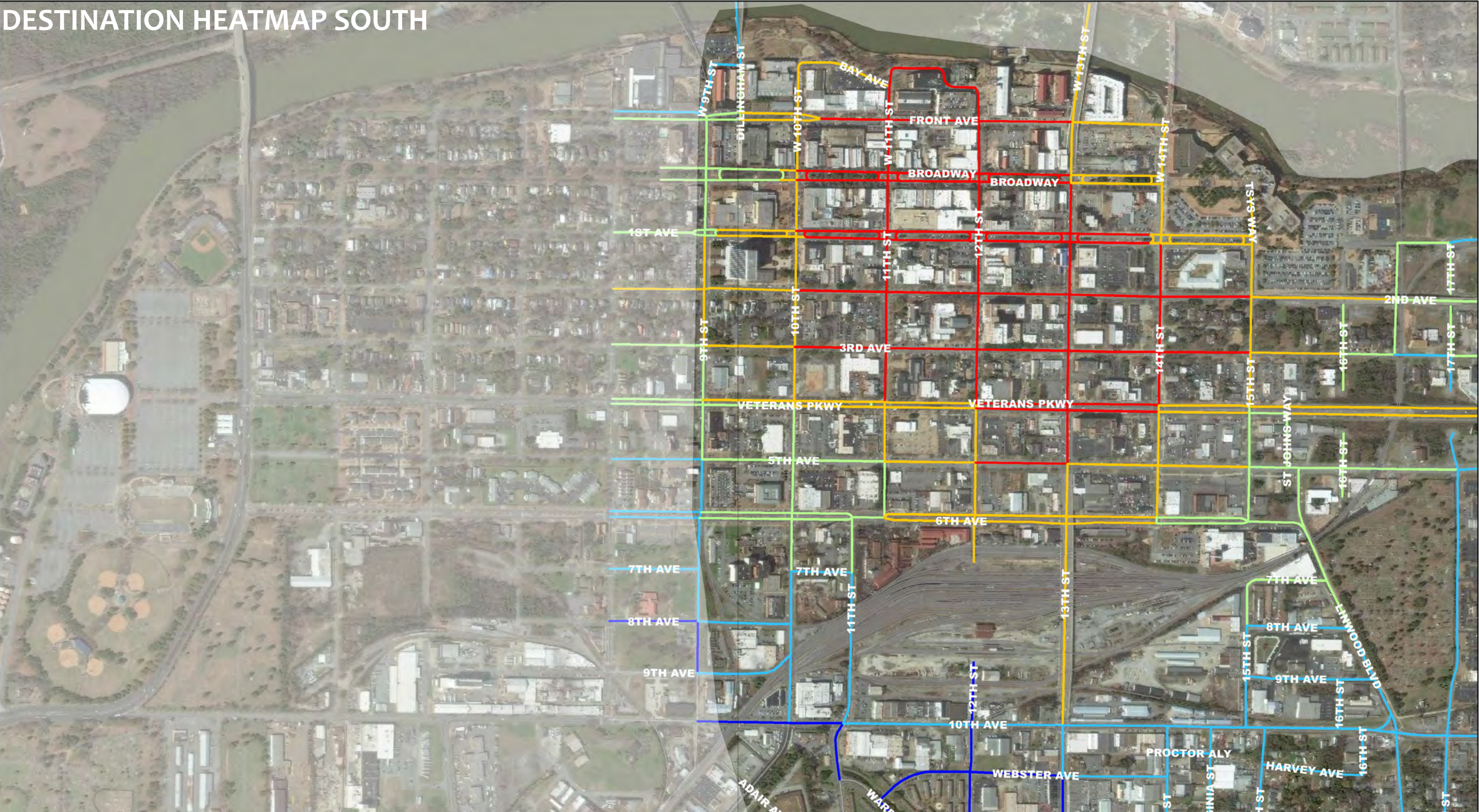


LEGEND

- Lowest Connectivity
- Low Connectivity
- Medium Connectivity
- High Connectivity
- Highest Connectivity



DESTINATION HEATMAP SOUTH

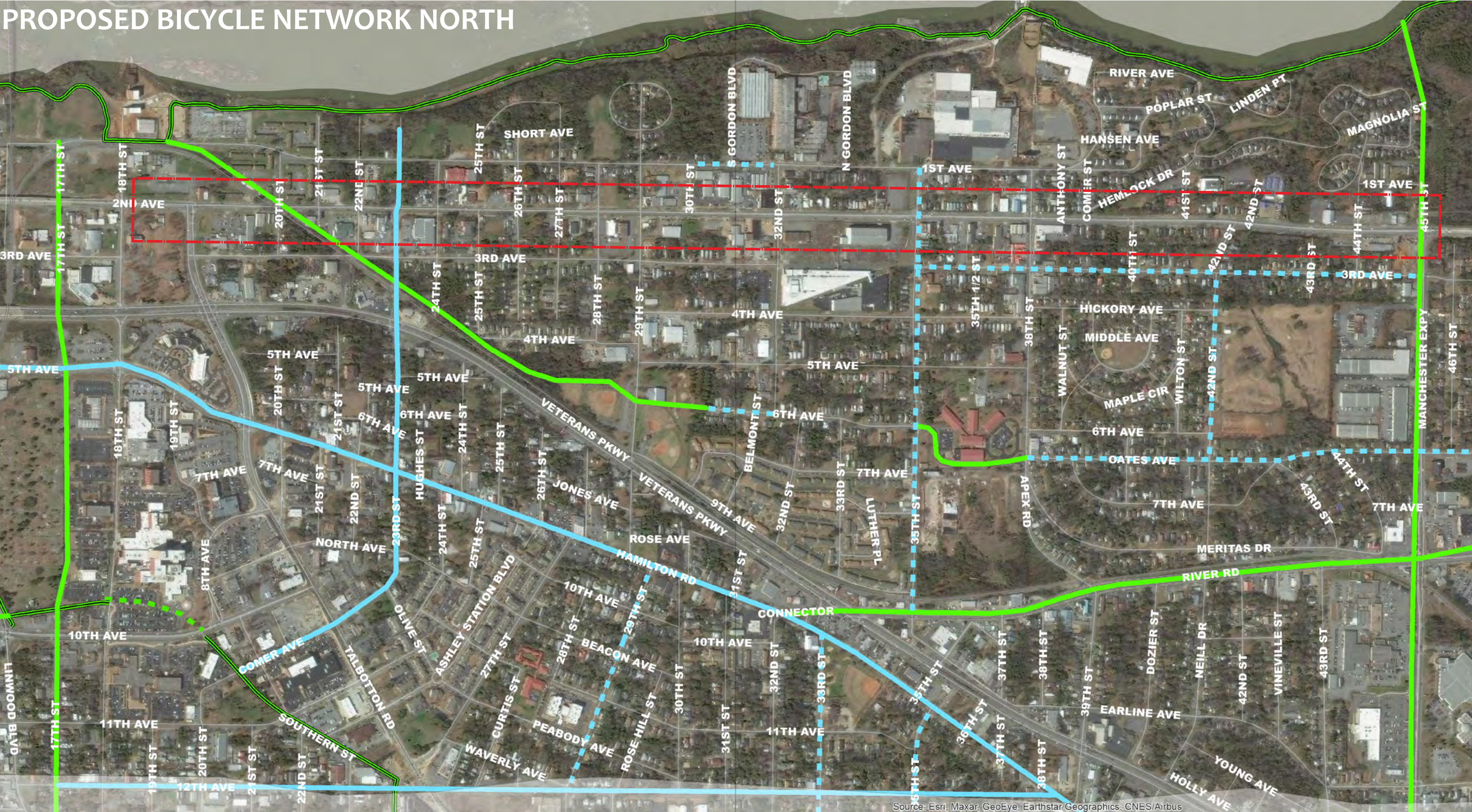


LEGEND

- | | |
|---------------------|----------------------|
| Lowest Connectivity | High Connectivity |
| Low Connectivity | Highest Connectivity |
| Medium Connectivity | |



PROPOSED BICYCLE NETWORK NORTH

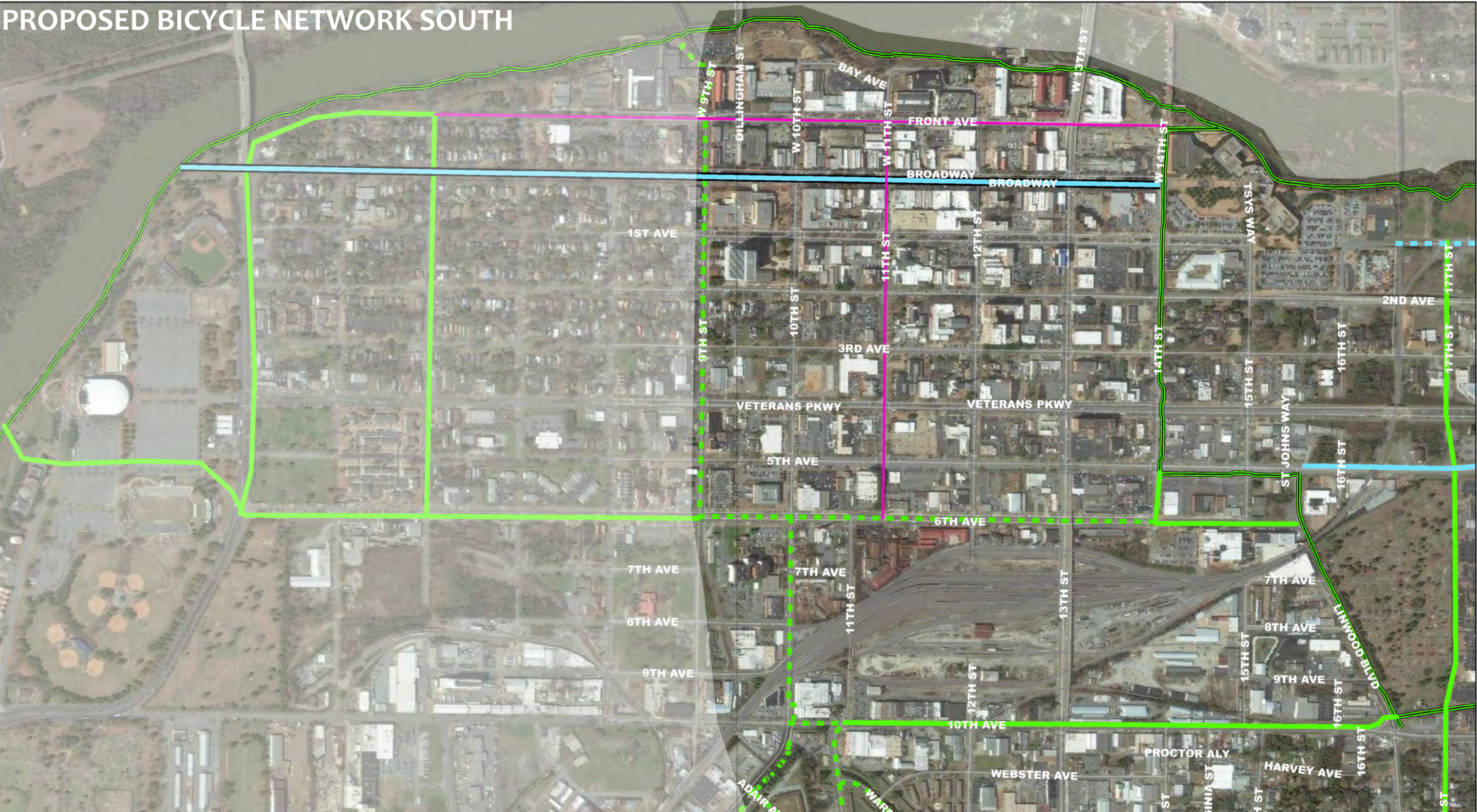


LEGEND

- | | | |
|--|---|--|
|  Existing Shared-Use Path |  Bike Boulevard |  Project Limits |
|  City Proposed Shared-Use Path |  Bike Lane | |
| |  Cycle Track | |
| |  Shared-Use Path | |



PROPOSED BICYCLE NETWORK SOUTH



LEGEND

Existing Shared-Use Path

City Proposed Shared-Use Path

Bike Boulevard

Bike Lane

Cycle Track

Shared-Use Path

Project Limits

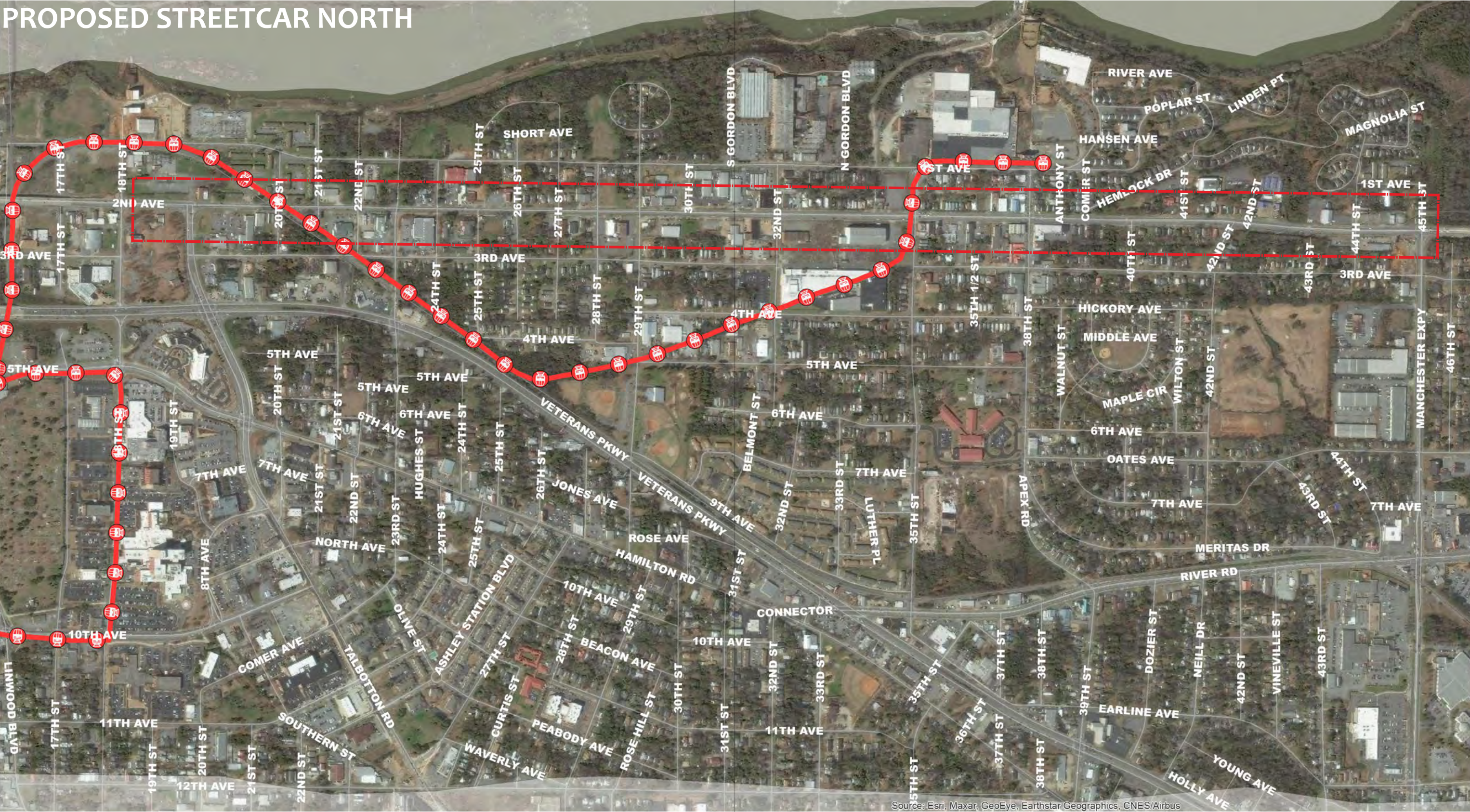
110

TRANSPORTATION SYSTEM ANALYSIS | City of Columbus

2nd Avenue Streetscape Study | TRANSPORTATION SYSTEM ANALYSIS

111

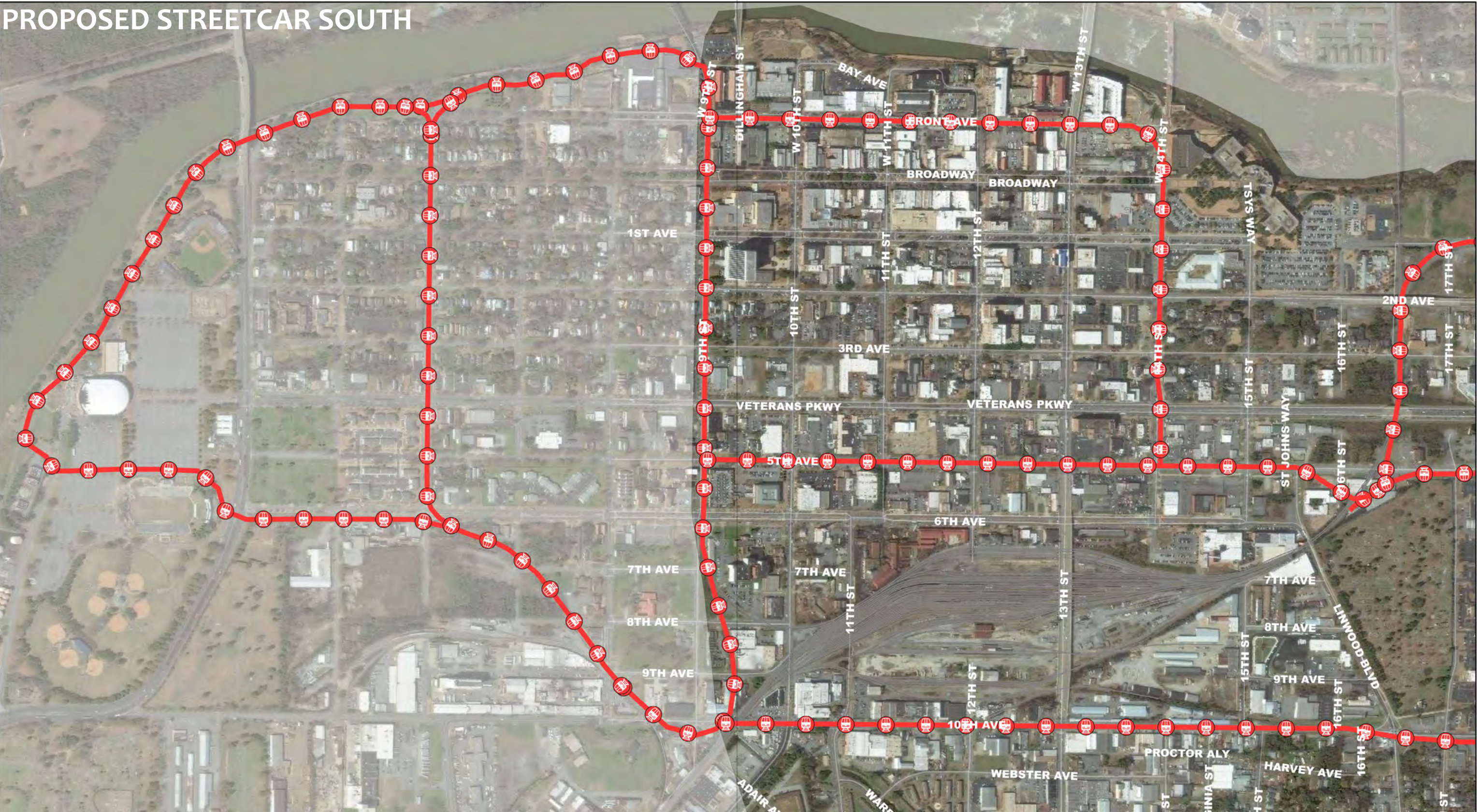
PROPOSED STREETCAR NORTH



LEGEND

Proposed Streetcar Line

PROPOSED STREETCAR SOUTH



LEGEND

Proposed Streetcar Line





04

CORRIDOR PLAN

- 4.1 Overall Plan
- 4.2 Enlargement
- 4.3 Proposed Typical Sections
- 4.4 Material Considerations
- 4.5 Site Furniture Considerations
- 4.6 Gateway and Wayfinding Signage
- 4.7 Green Infrastructure Tool Kit

4.1 OVERALL PLAN



42nd STREET TO MANCHESTER EXPRESSWAY



4.1 OVERALL PLAN



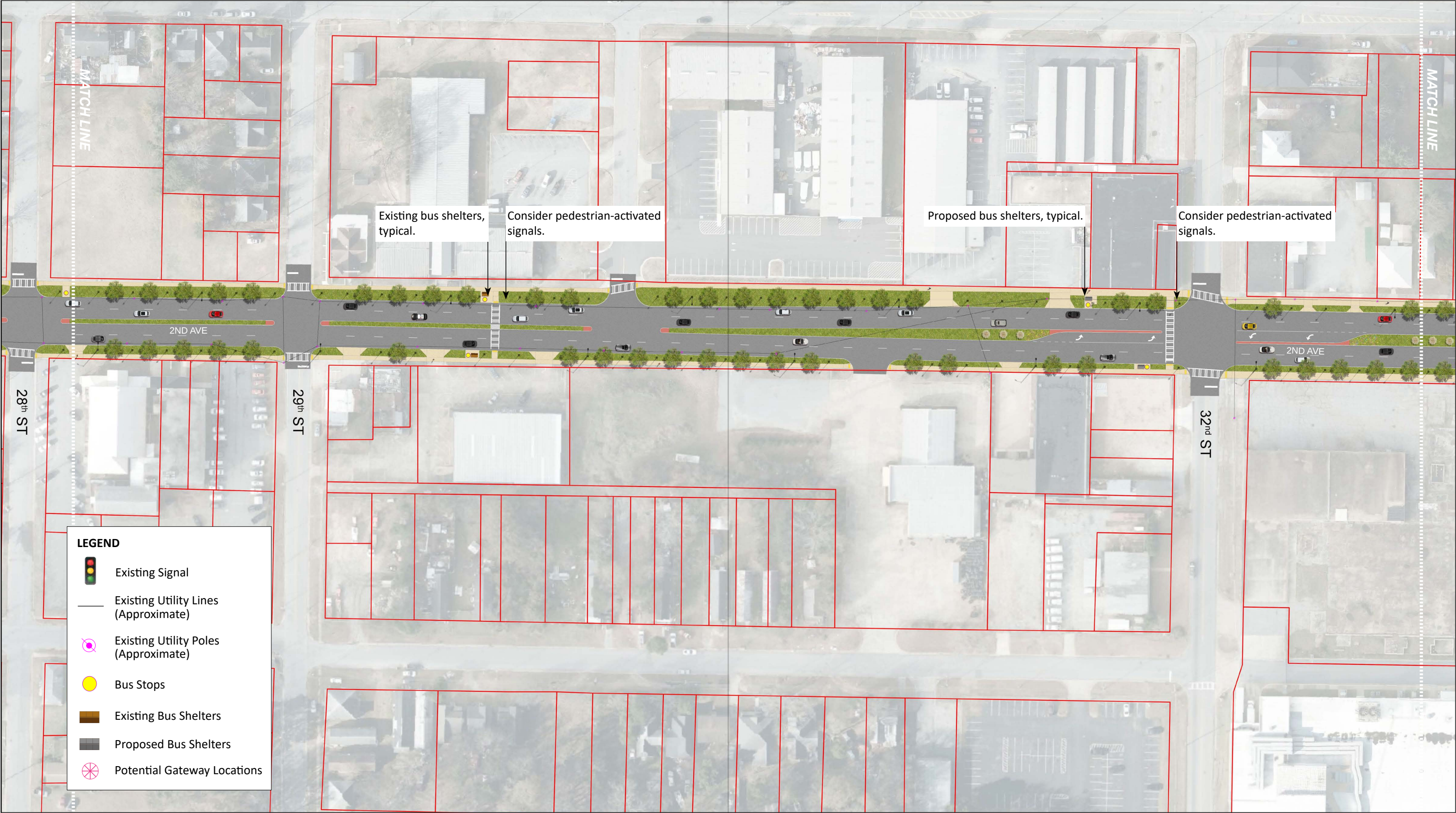
38th STREET TO 42nd STREET



4.1 OVERALL PLAN



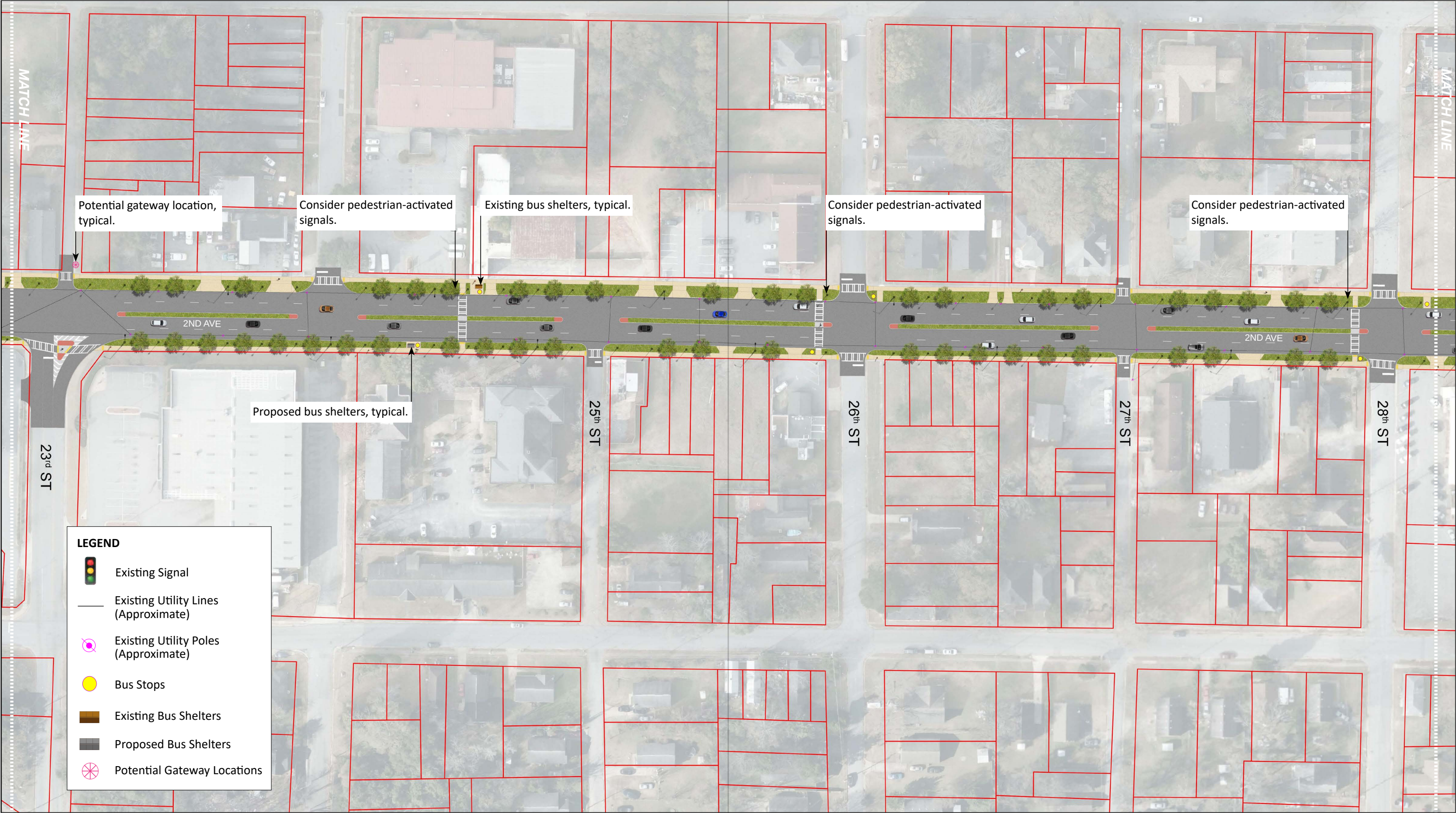
4.1 OVERALL PLAN



28th STREET TO 32nd STREET (WITH MEDIANS)



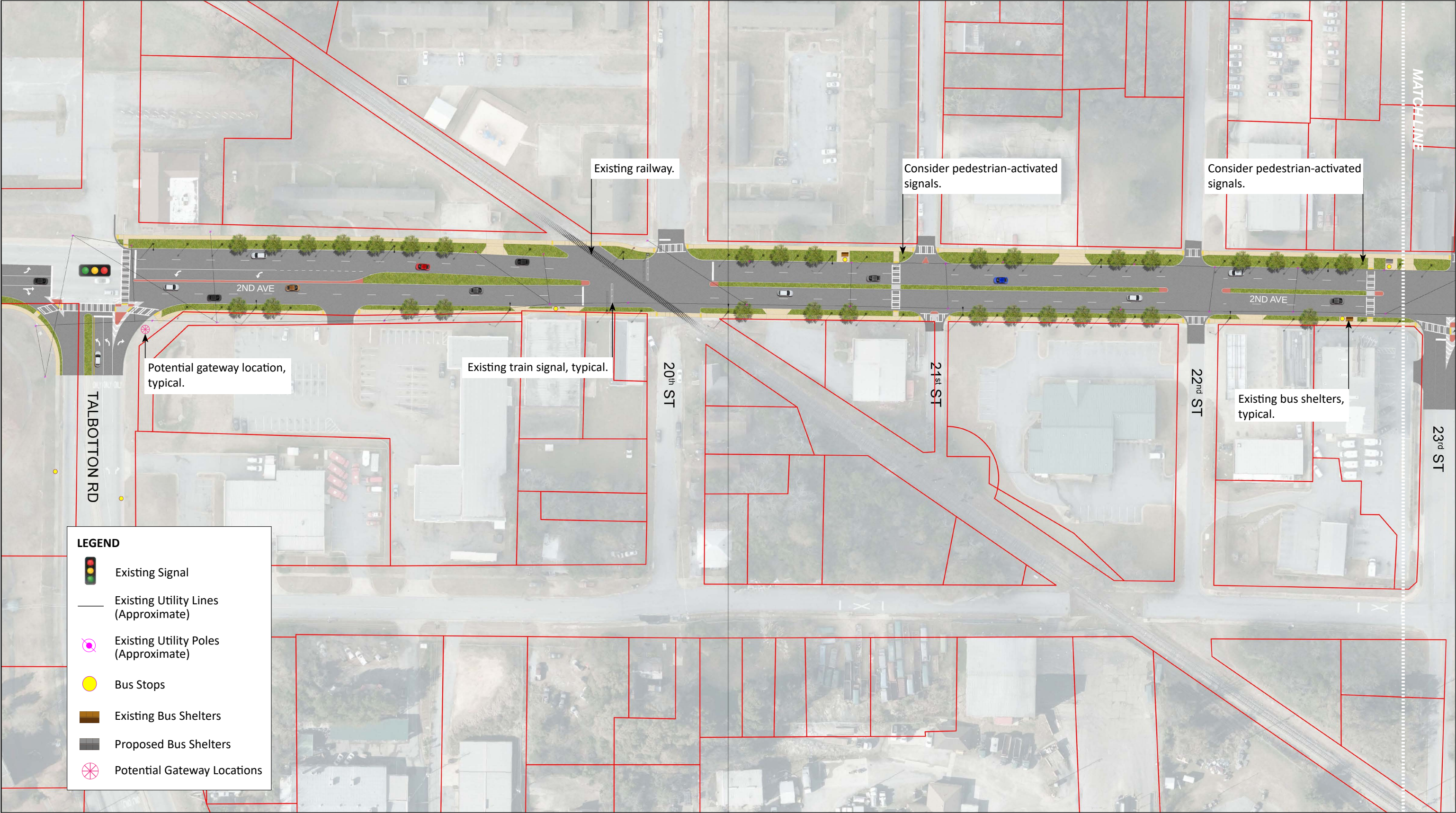
4.1 OVERALL PLAN



23rd STREET TO 28th STREET (WITH MEDIANS)



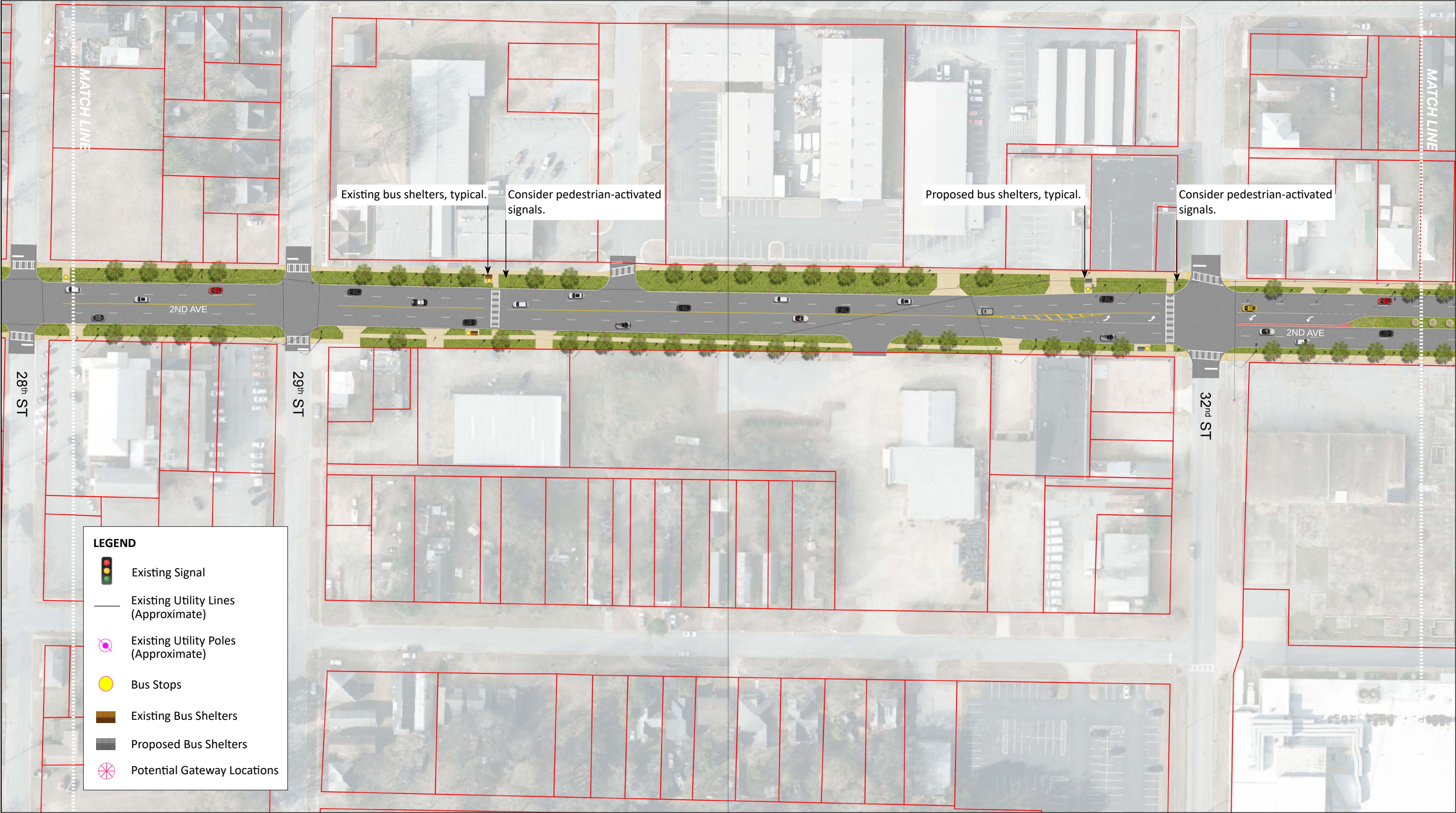
4.1 OVERALL PLAN



TALBOTTON ROAD TO 23rd STREET (WITH MEDIANS)



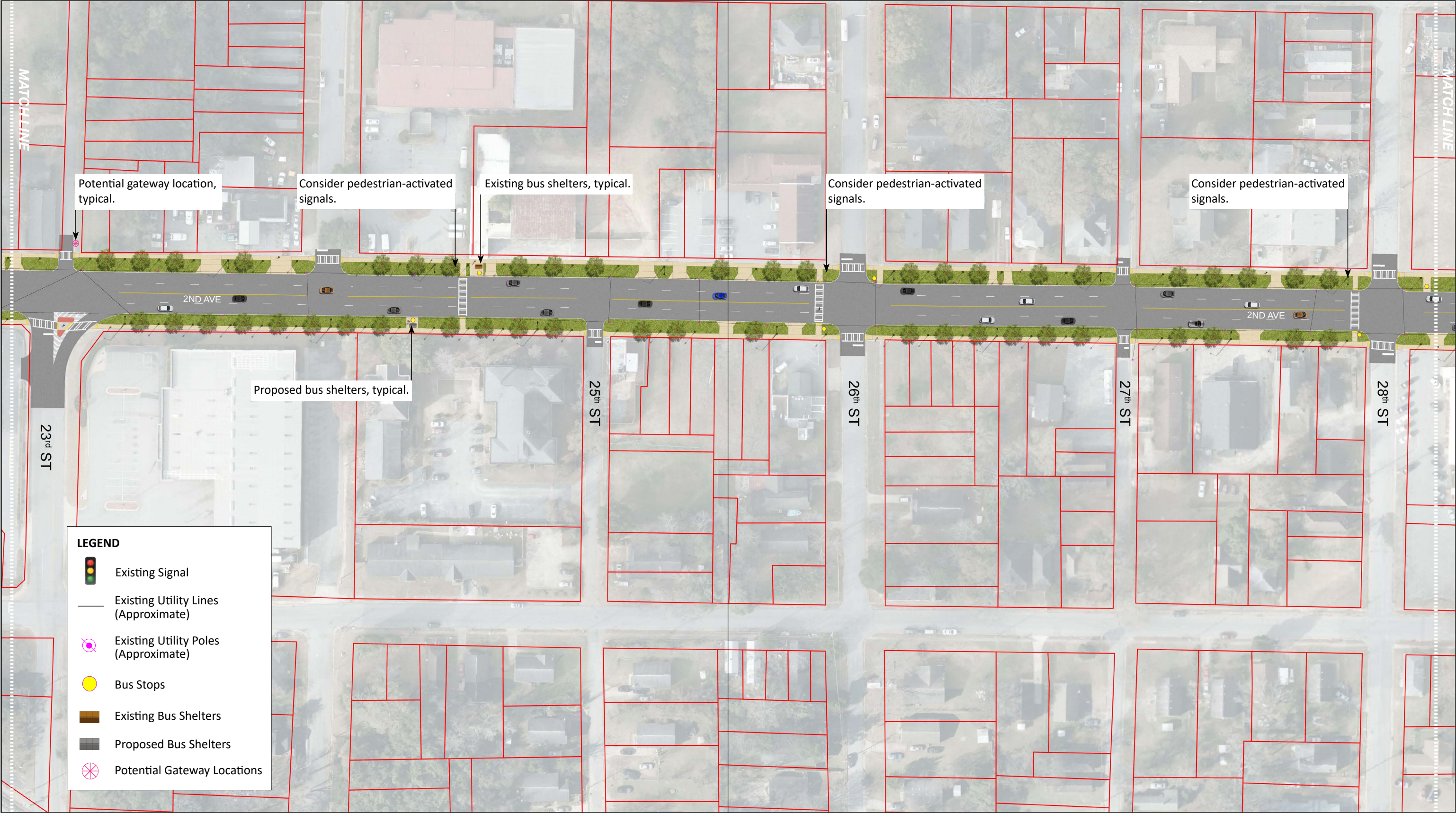
4.1 OVERALL PLAN



28th STREET TO 32nd STREET (WITHOUT MEDIANS)



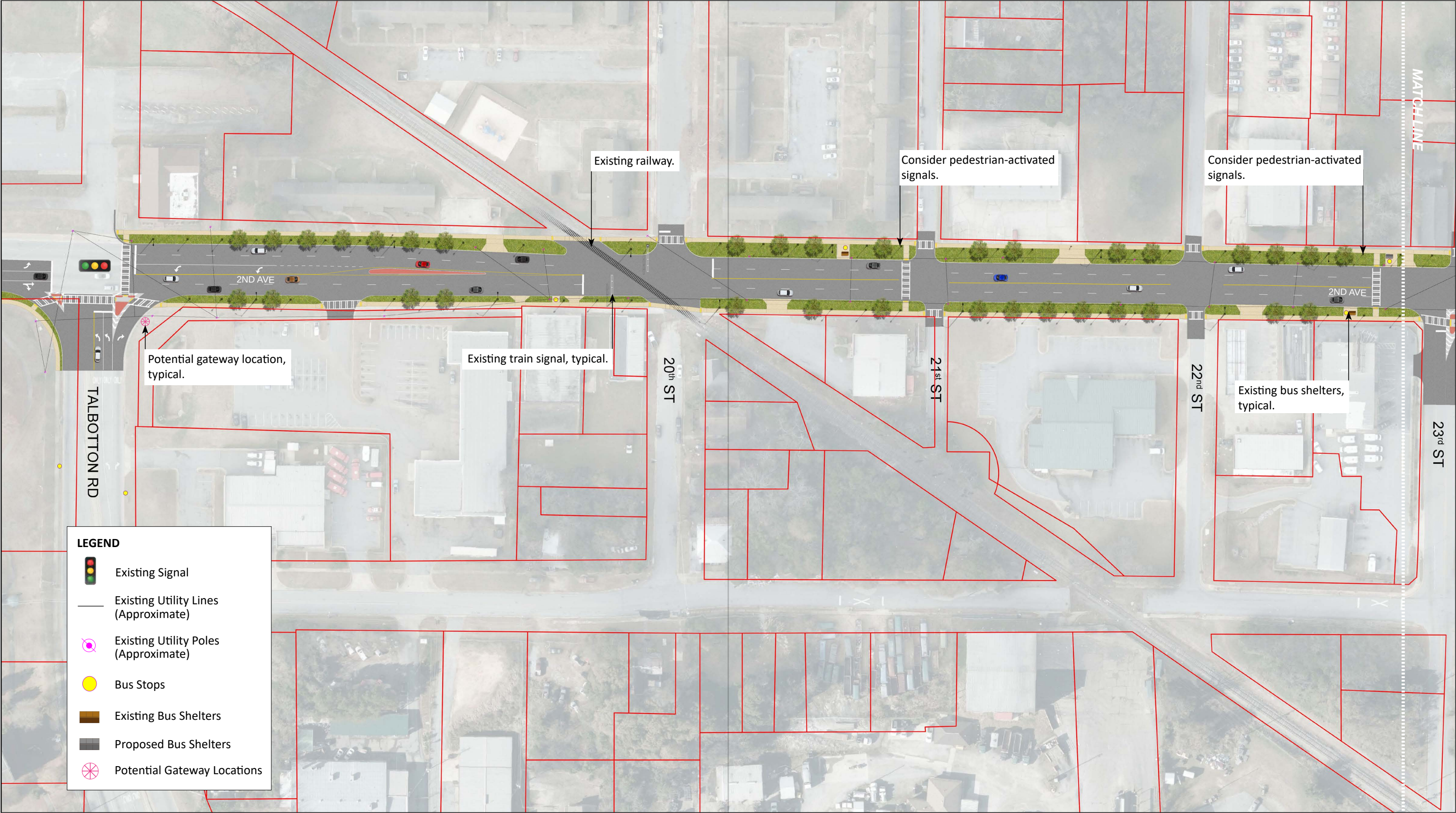
4.1 OVERALL PLAN



23rd STREET TO 28th STREET (WITHOUT MEDIANS)



4.1 OVERALL PLAN



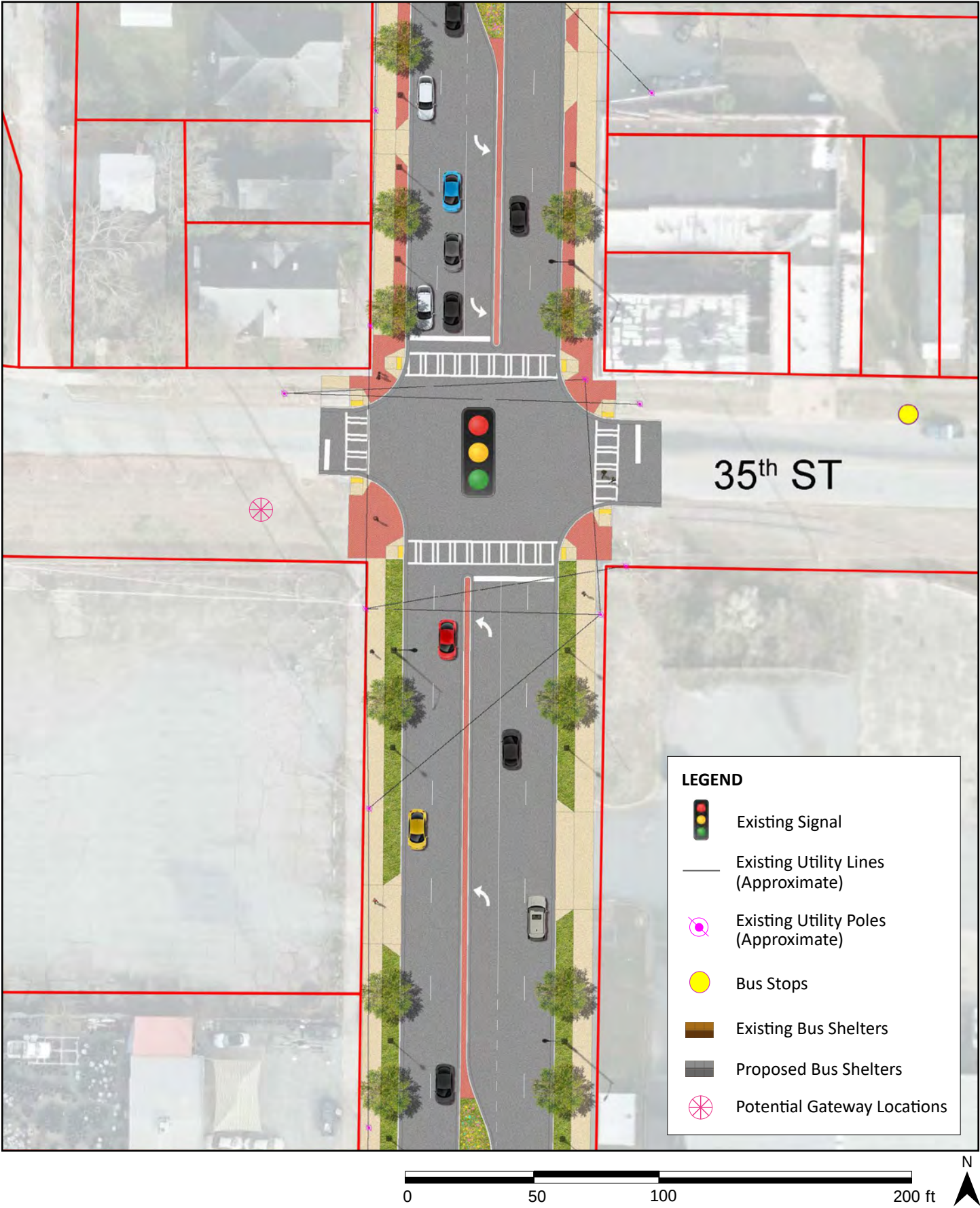
TALBOTTON ROAD TO 23rd STREET (WITHOUT MEDIANS)

4.2 ENLARGEMENT

INTERSECTION AT MANCHESTER EXPRESSWAY



INTERSECTION AT 35th STREET



4.2 ENLARGEMENT

INTERSECTION AT 20th STREET (WITH MEDIANS)



INTERSECTION AT 20th STREET (WITHOUT MEDIANS)



4.2 ENLARGEMENT

INTERSECTION AT TALBOTTON ROAD (WITH MEDIANS)

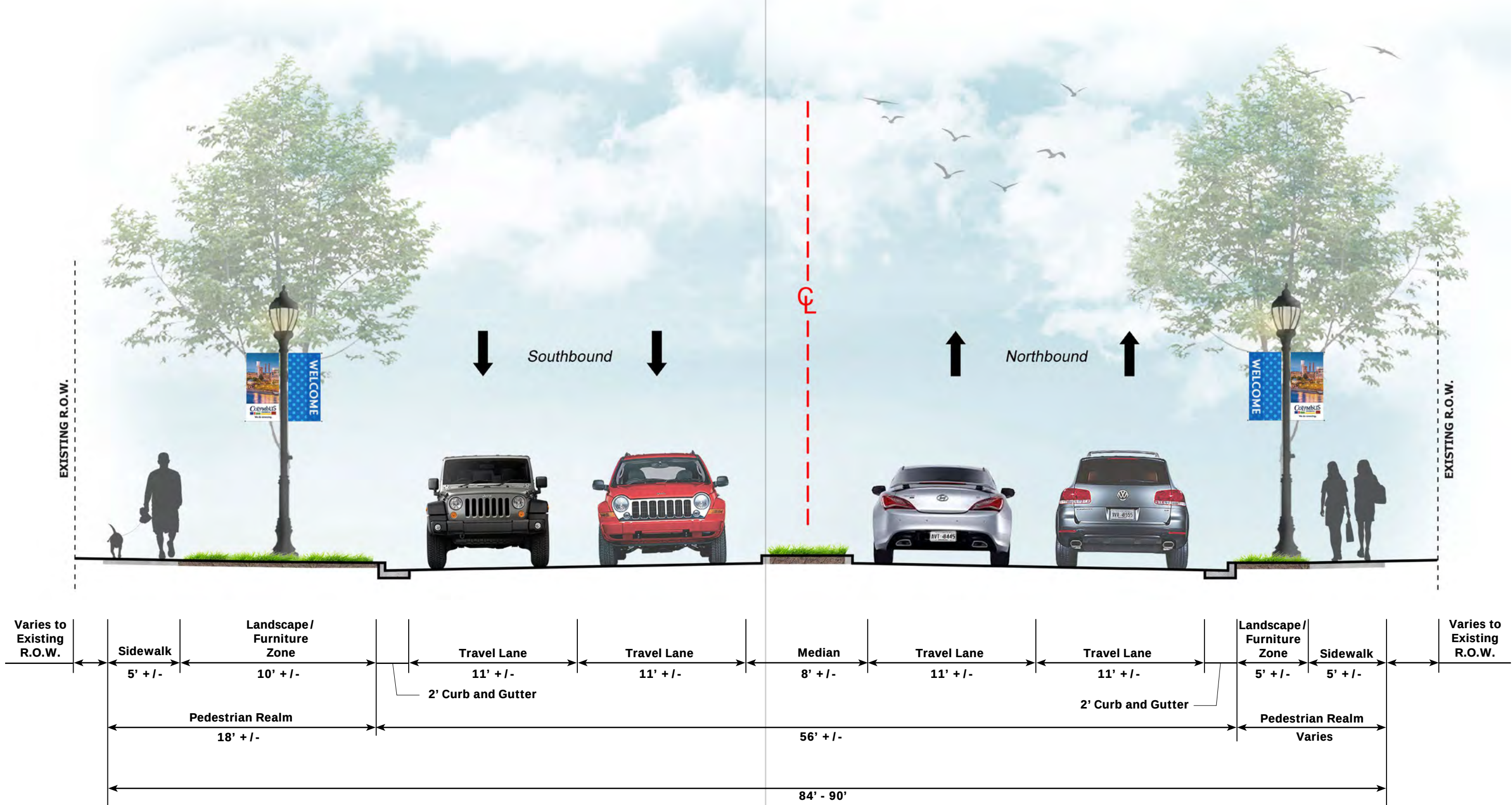


INTERSECTION AT TALBOTTON ROAD (WITHOUT MEDIANS)



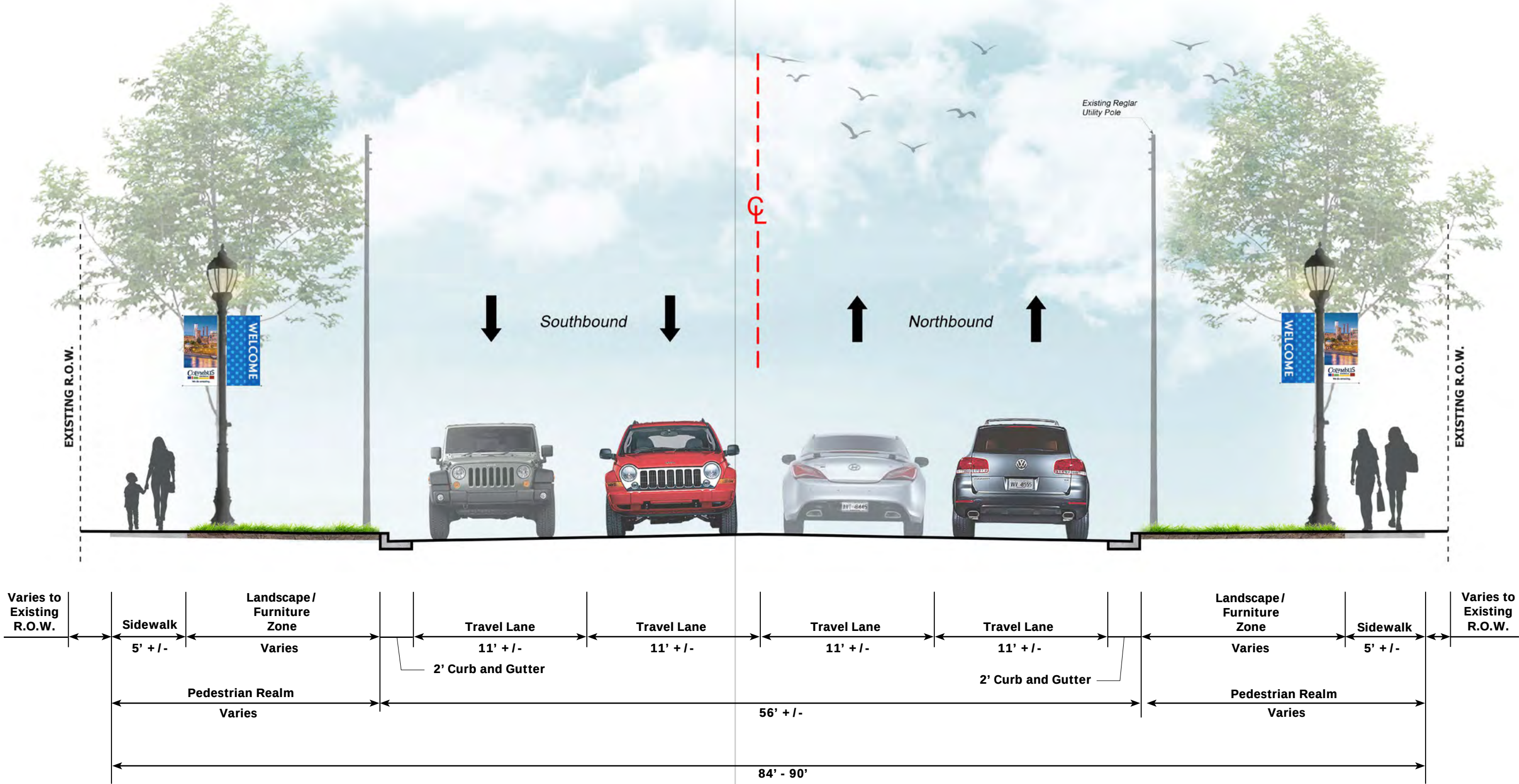
4.3 PROPOSED TYPICAL SECTIONS

20th STREET TO 29th STREET (WITH MEDIANS)



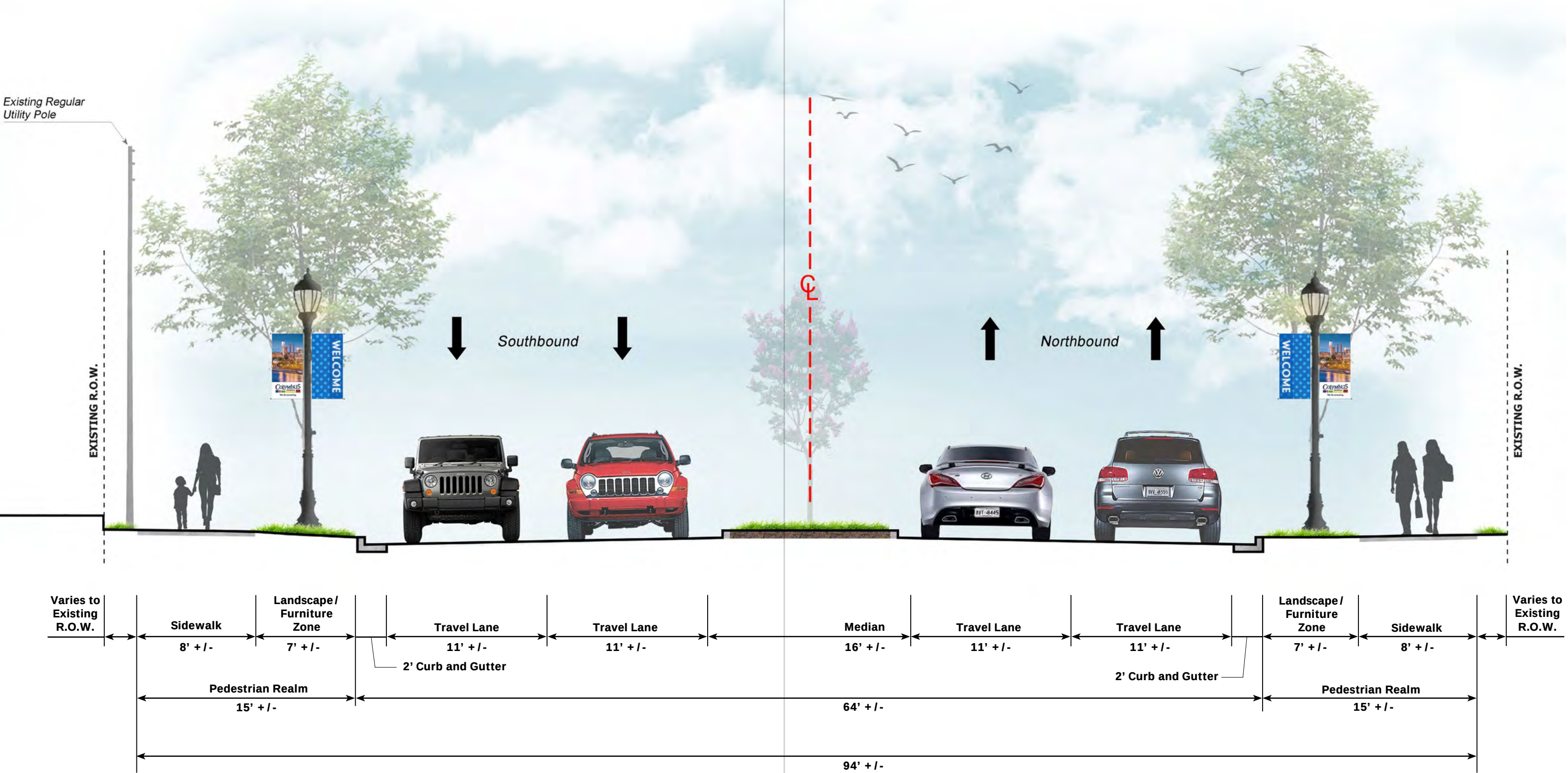
4.3 PROPOSED TYPICAL SECTIONS

20th STREET TO 29th STREET (WITHOUT MEDIANS)



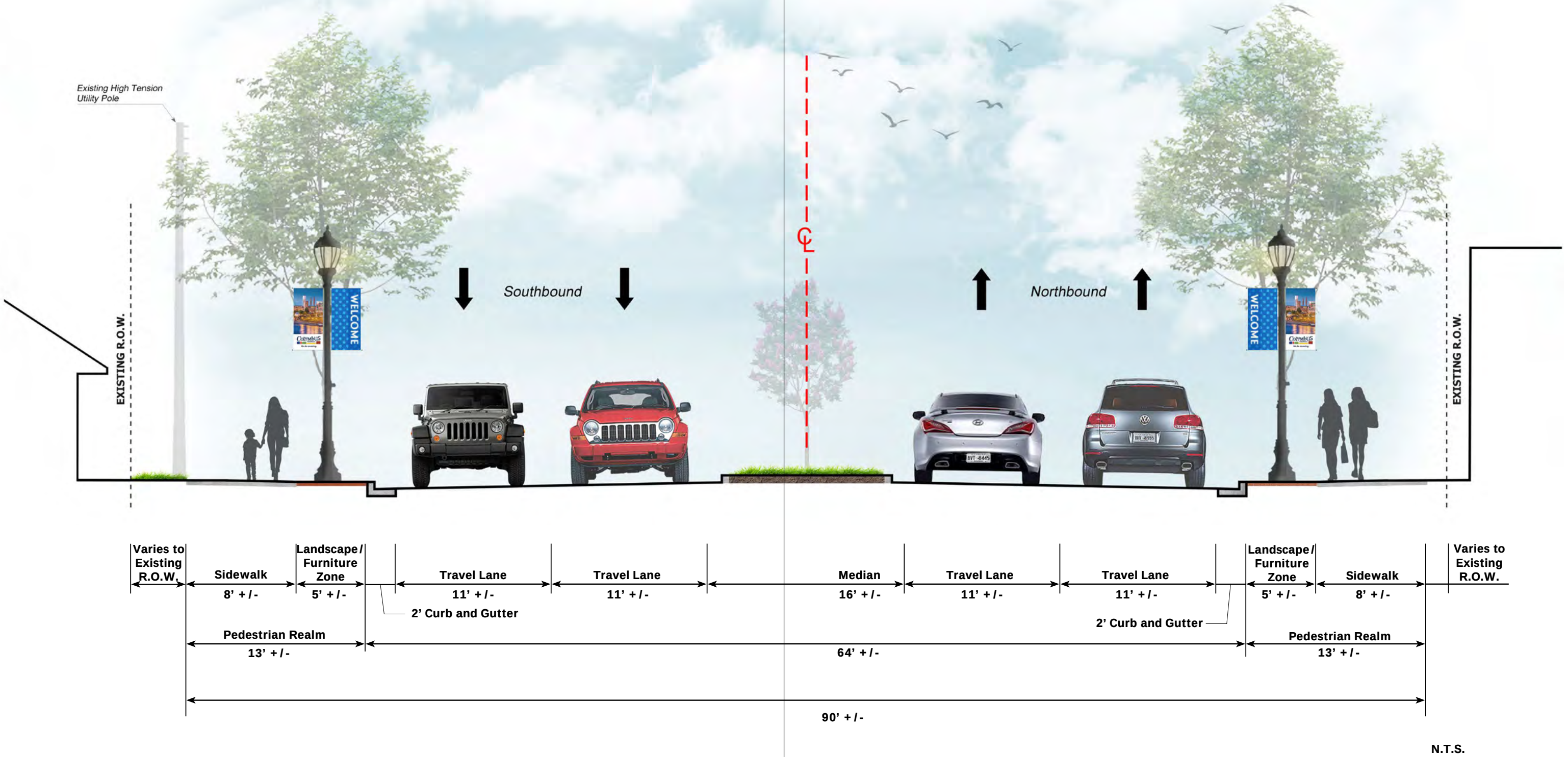
4.3 PROPOSED TYPICAL SECTIONS

32nd STREET TO 35th STREET



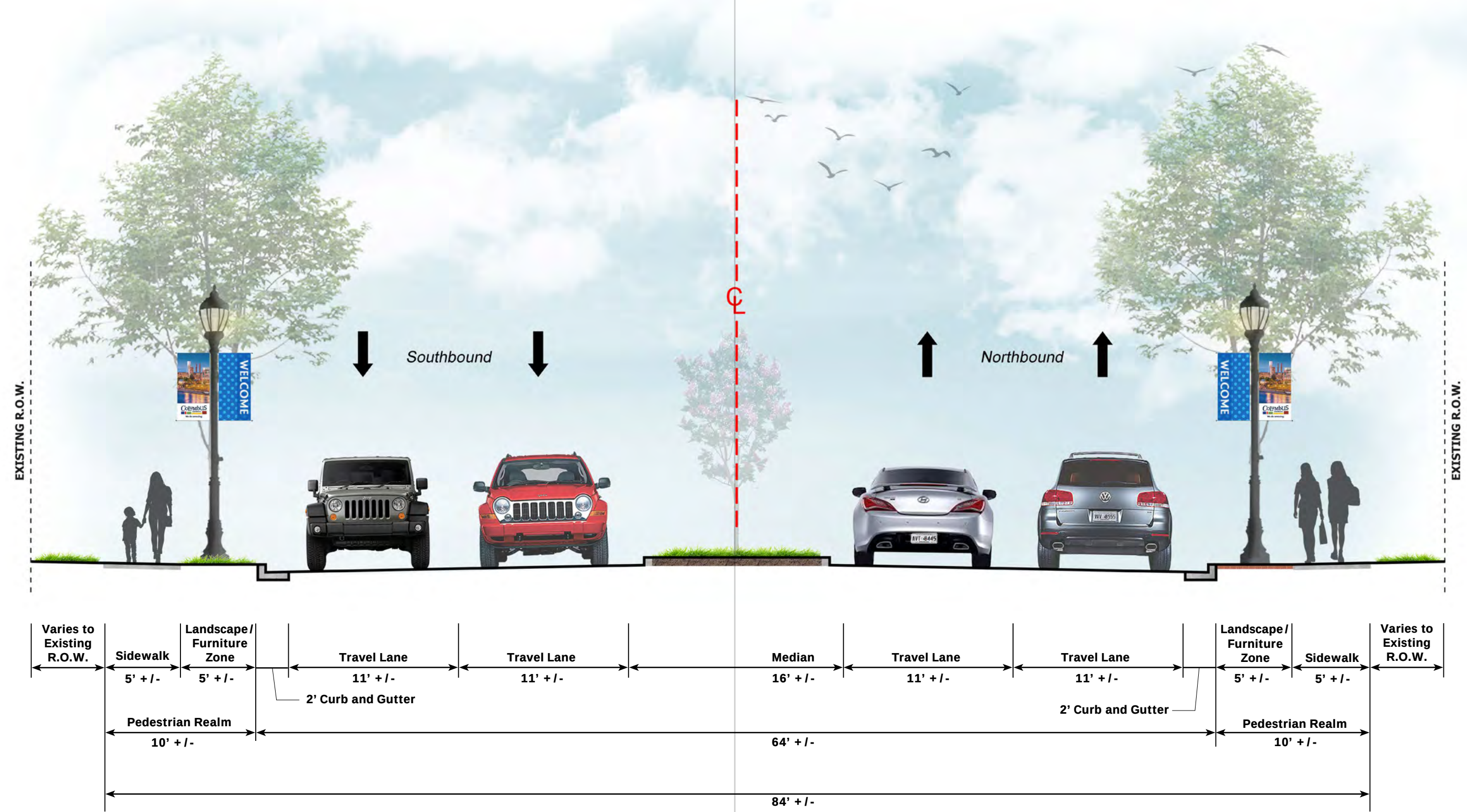
4.3 PROPOSED TYPICAL SECTIONS

35th STREET TO 38th STREET



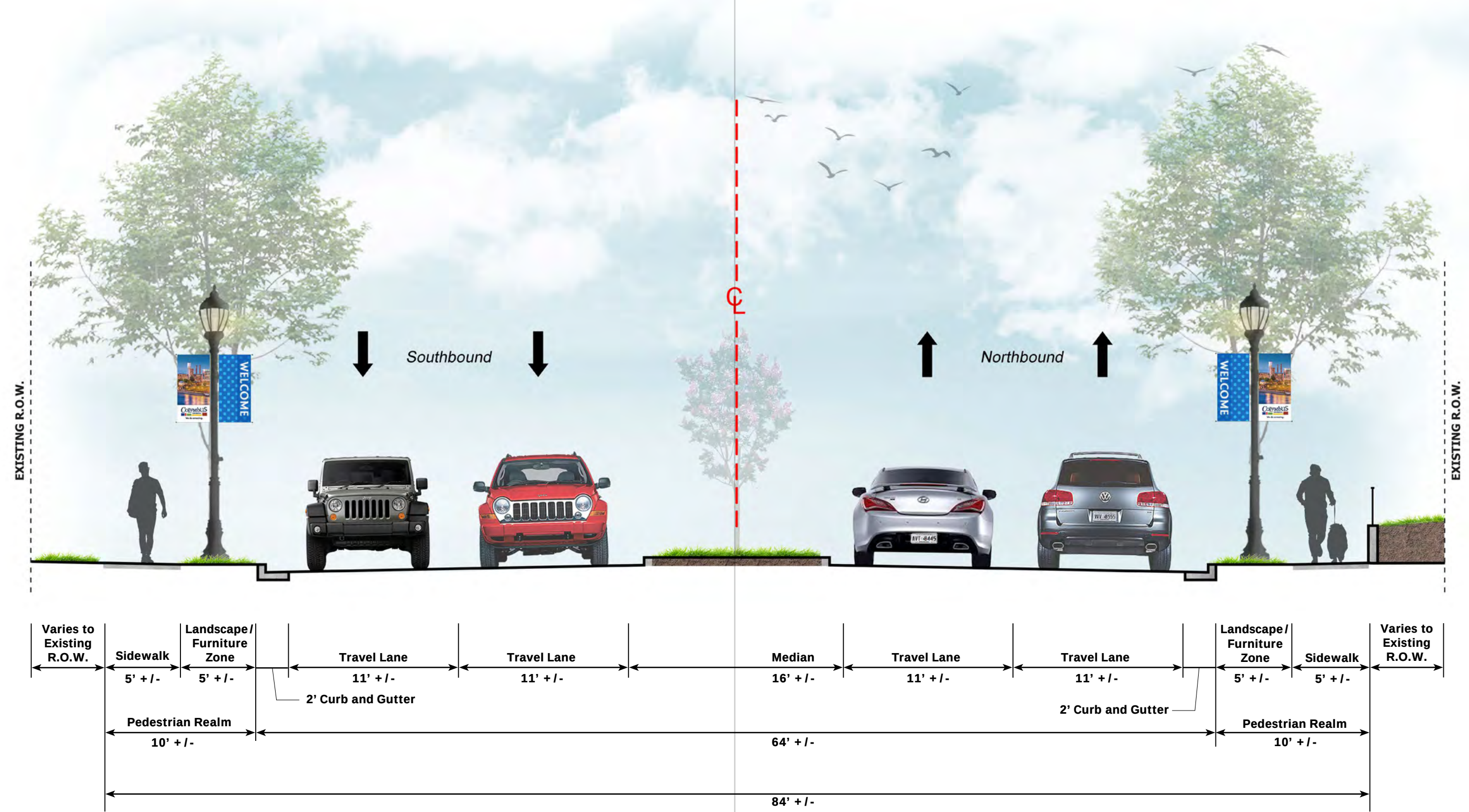
4.3 PROPOSED TYPICAL SECTIONS

38th STREET 40th STREET



4.3 PROPOSED TYPICAL SECTIONS

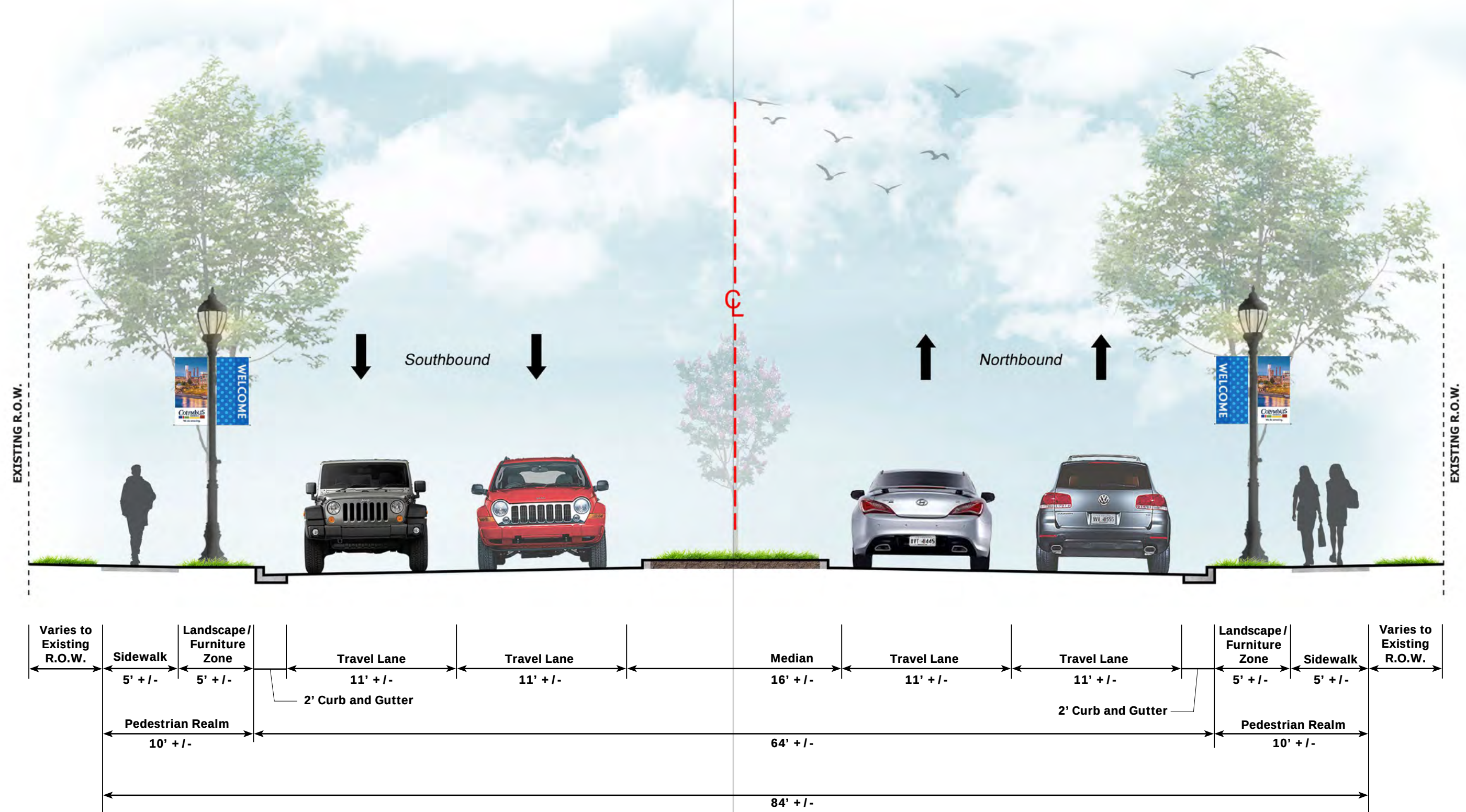
40th STREET TO 42nd STREET



N.T.S.

4.3 PROPOSED TYPICAL SECTIONS

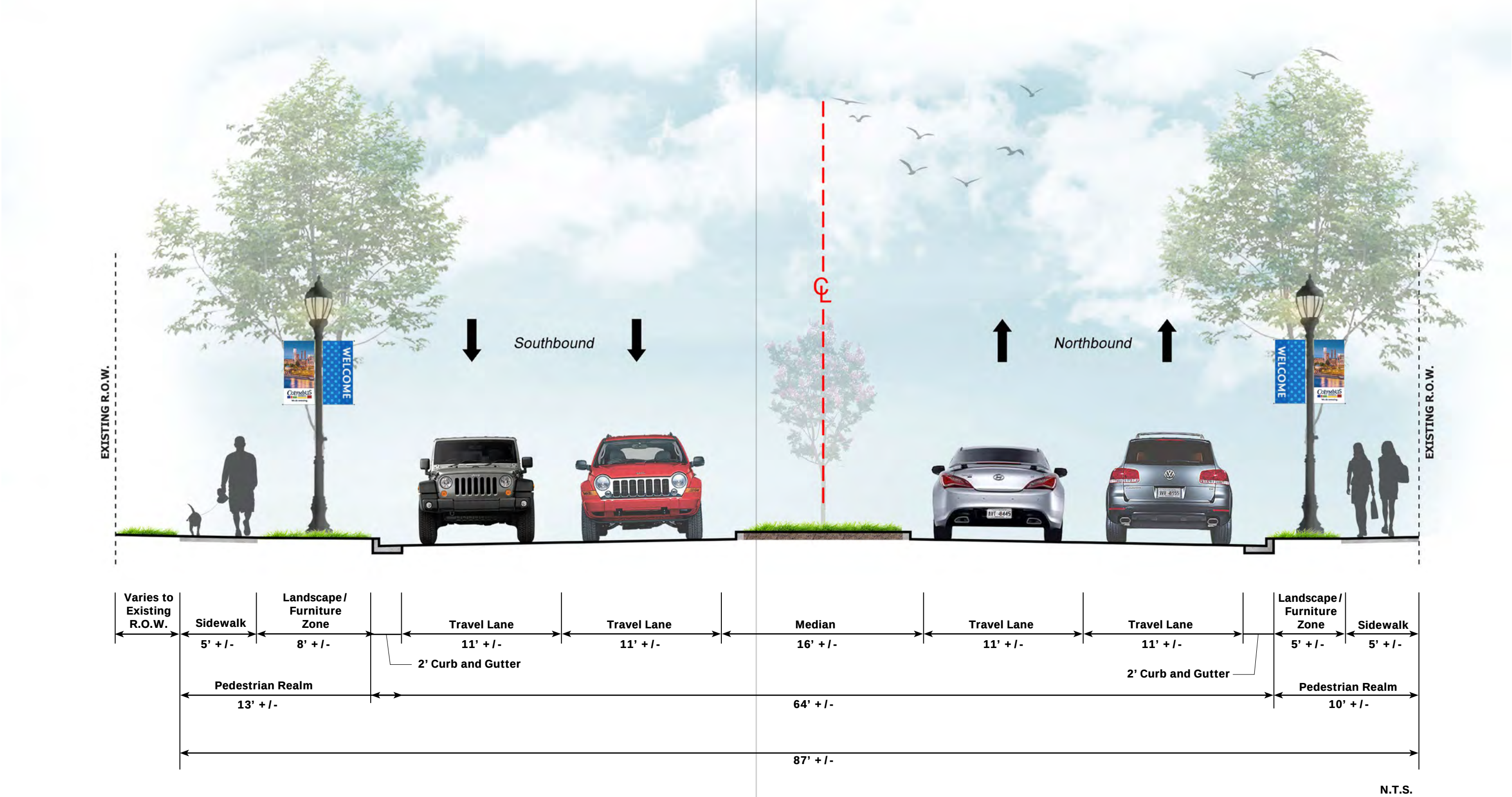
42nd STREET TO 44th STREET



N.T.S.

4.3 PROPOSED TYPICAL SECTIONS

44th STREET TO MANCHESTER EXPRESSWAY



4.4 CONCEPT RENDERINGS

INTERSECTION OF 2nd AVENUE AND 38th STREET



Before Conditions



After Concept Rendering

2nd AVENUE NORTH OF 40th STREET



Before Conditions



After Concept Rendering

4.5 MATERIAL CONSIDERATIONS

INSPIRATION



Chattahoochee River

MATERIAL



River Rock



DESIGN

- Gateway Feature (Incorporate)
- Art Installation
- Wall



Mills



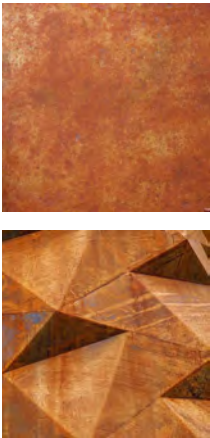
Brick



- Paver
- Gateway Feature



Historic District



Cor-Ten Steel



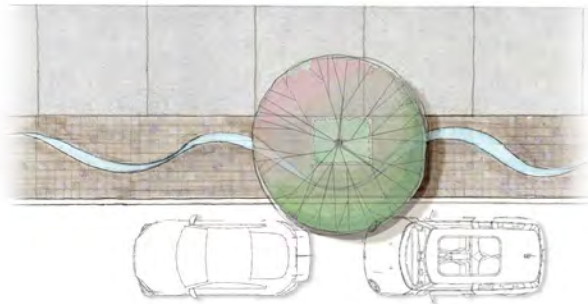
- Art Installations
- Urban elements

4.5 MATERIAL CONSIDERATIONS

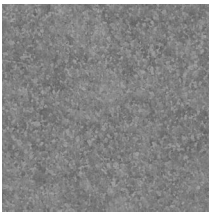
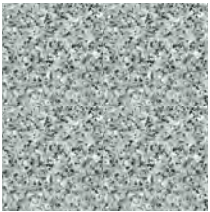
INSPIRATION

MATERIAL

DESIGN



Chattahoochee River



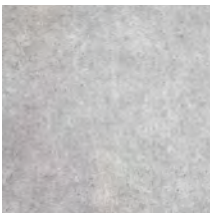
Granite



- Walls
- Paver bands



Mills



Concrete



- Sidewalks
- Gateway Feature



Historic District



Steel



- Art Installations

4.6 SITE FURNITURE CONSIDERATIONS

Bench



Pedestrian Lighting



Litter Receptacles



Bike Rack

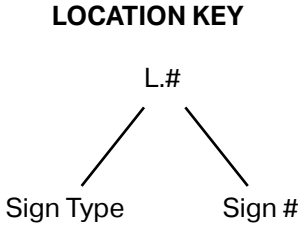


These are styles being studied for potential use, not necessarily recommendations for use.

4.7 GATEWAY AND WAYFINDING SIGNAGE

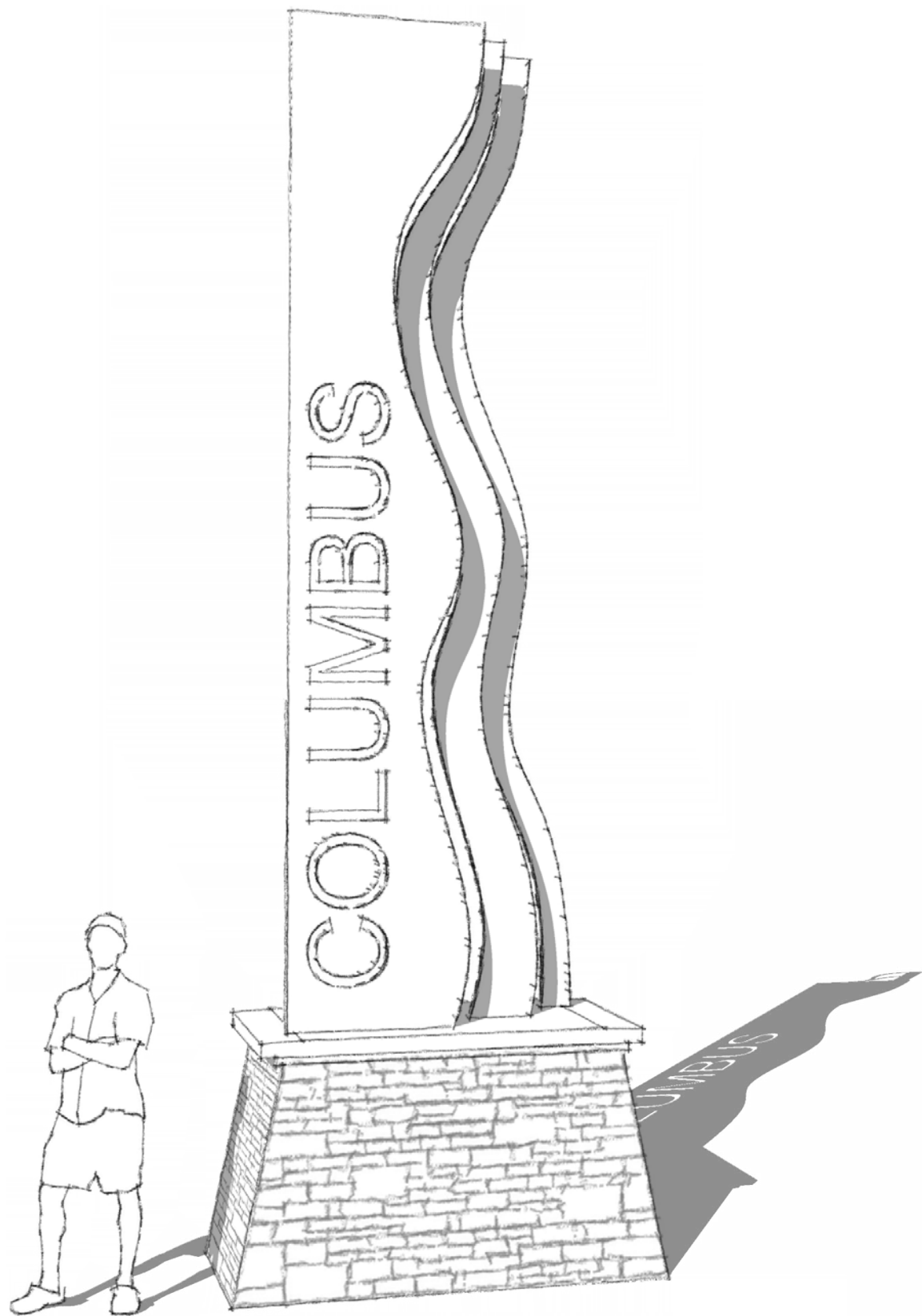


- LEGEND**
- A Primary Gateway
 - B Secondary Gateway
 - C Vehicular Directional
 - D Pedestrian Info Kiosk



4.7 GATEWAY AND WAYFINDING SIGNAGE

Primary Gateway Concept I for Consideration



Inspiration



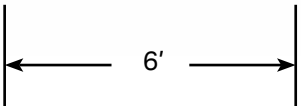
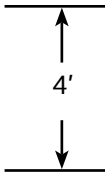
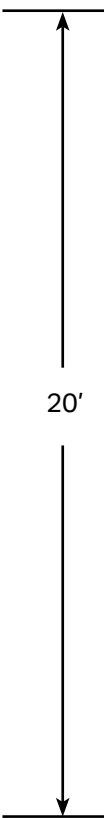
Material



Cor-ten Steel

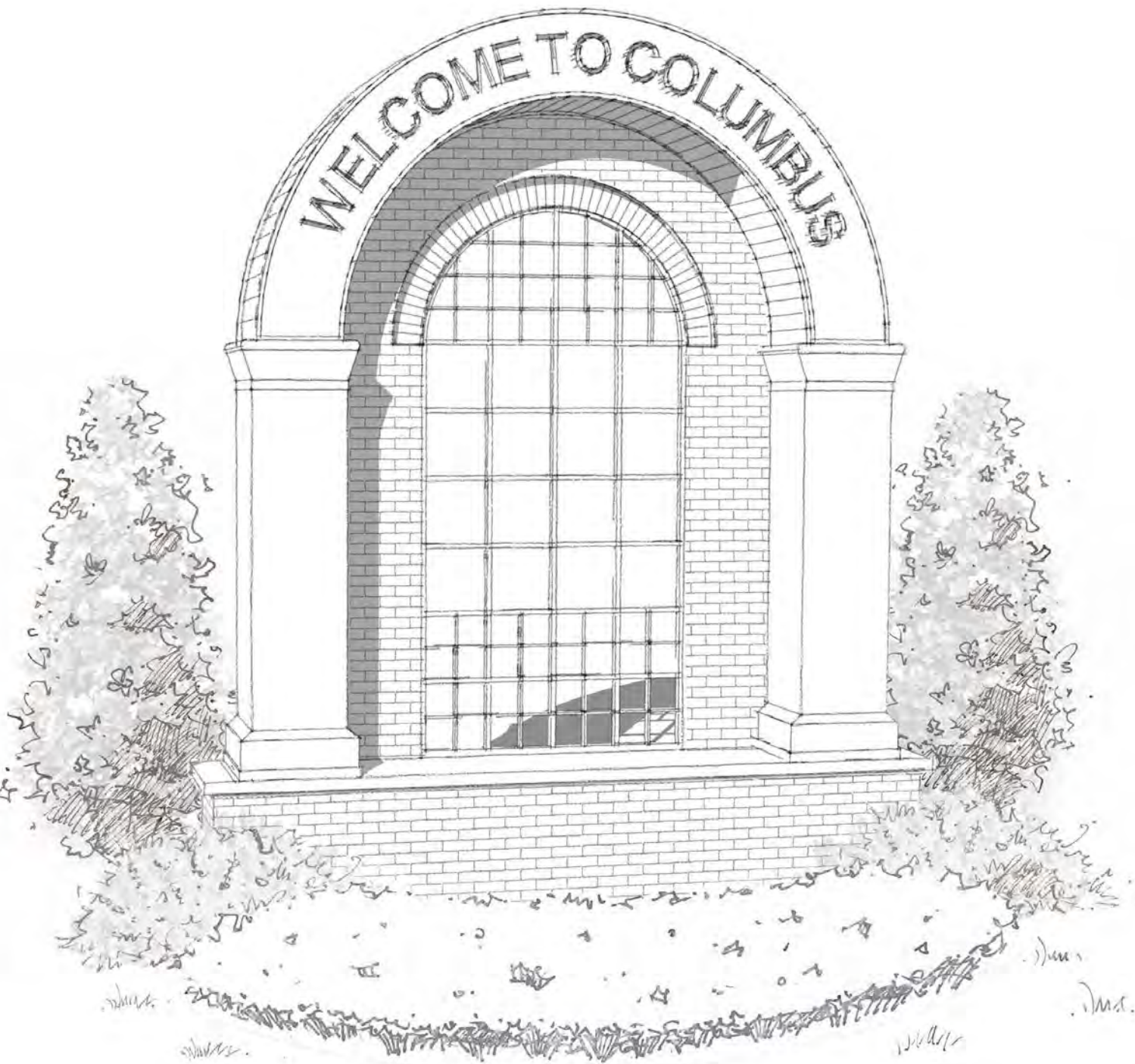


River Rock



4.7 GATEWAY AND WAYFINDING SIGNAGE

Primary Gateway Concept II for Consideration



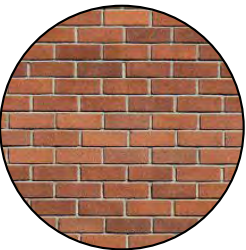
Inspiration



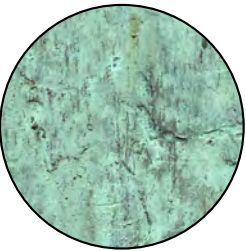
Material



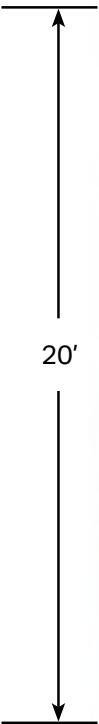
Precast Concrete



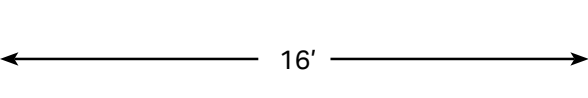
Brick



Painted Steel



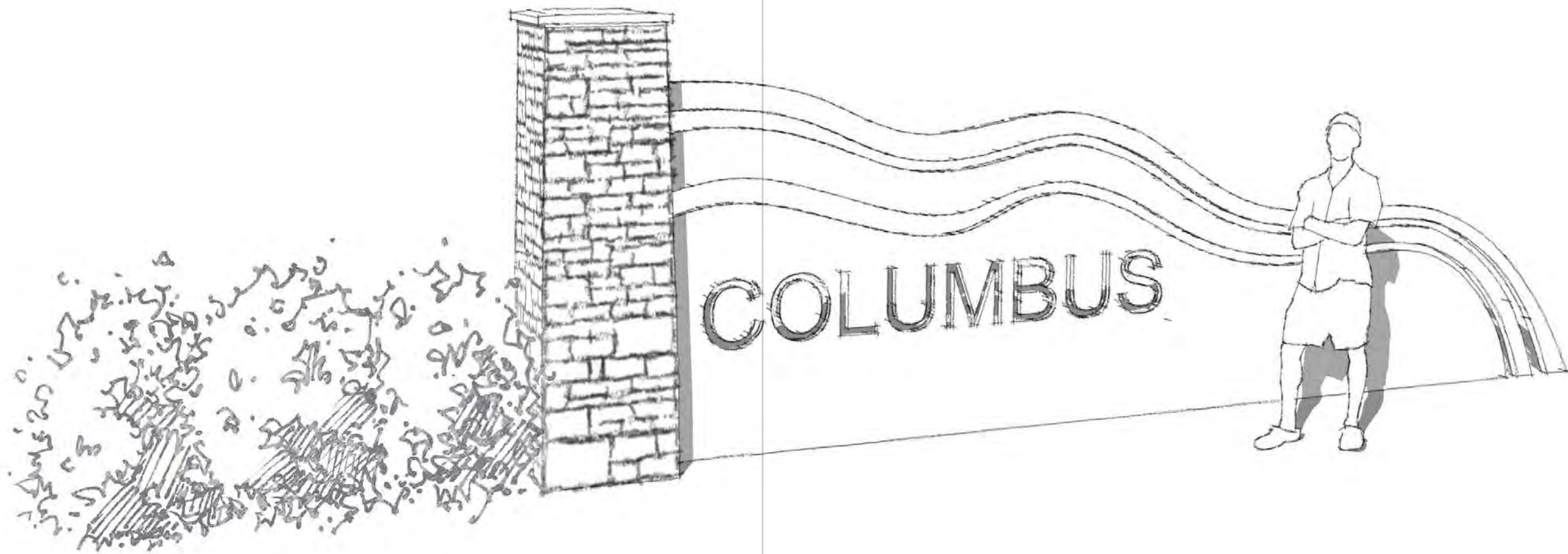
20'



16'

4.7 GATEWAY AND WAYFINDING SIGNAGE

Secondary Gateway Concept I for Consideration



Inspiration



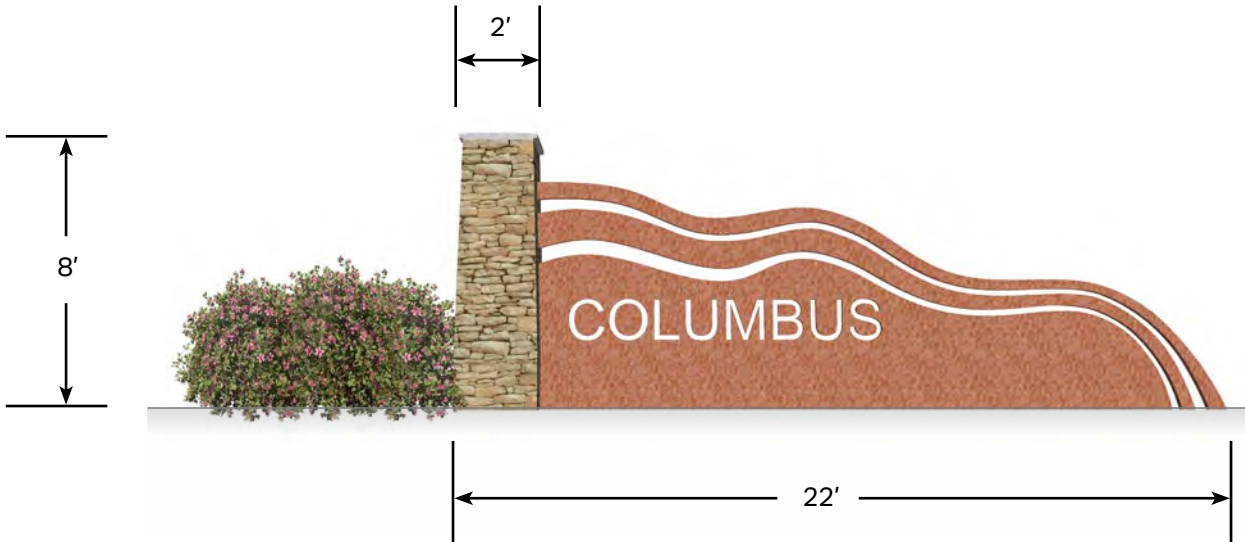
Material



Cor-ten Steel

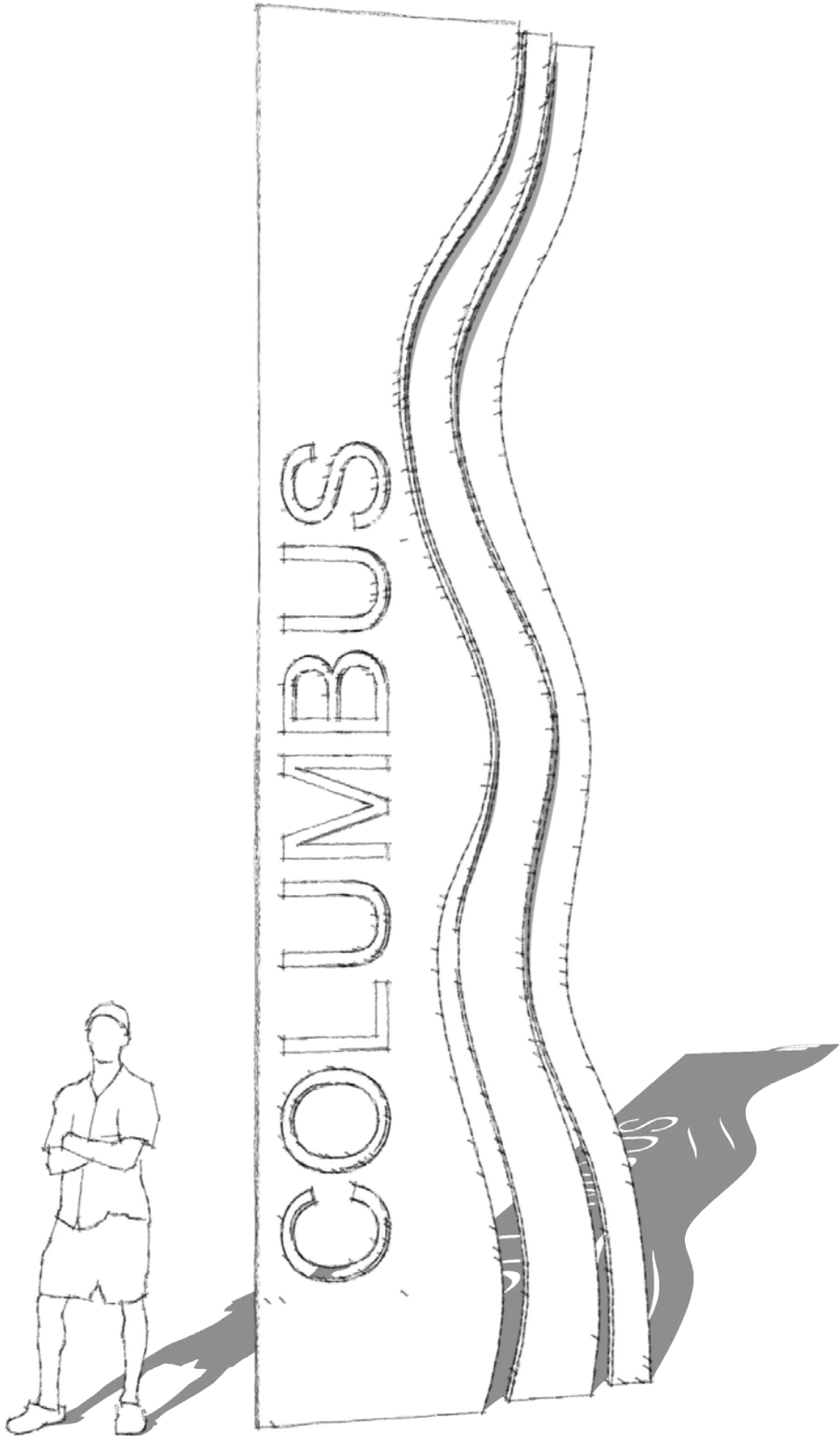


River Rock



4.7 GATEWAY AND WAYFINDING SIGNAGE

Secondary Gateway Concept II for Consideration



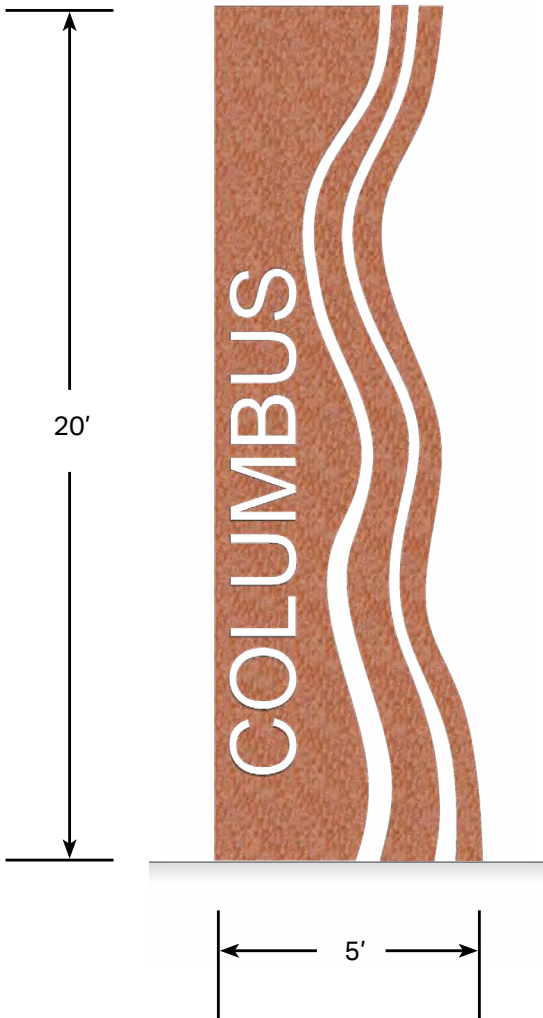
Inspiration



Material

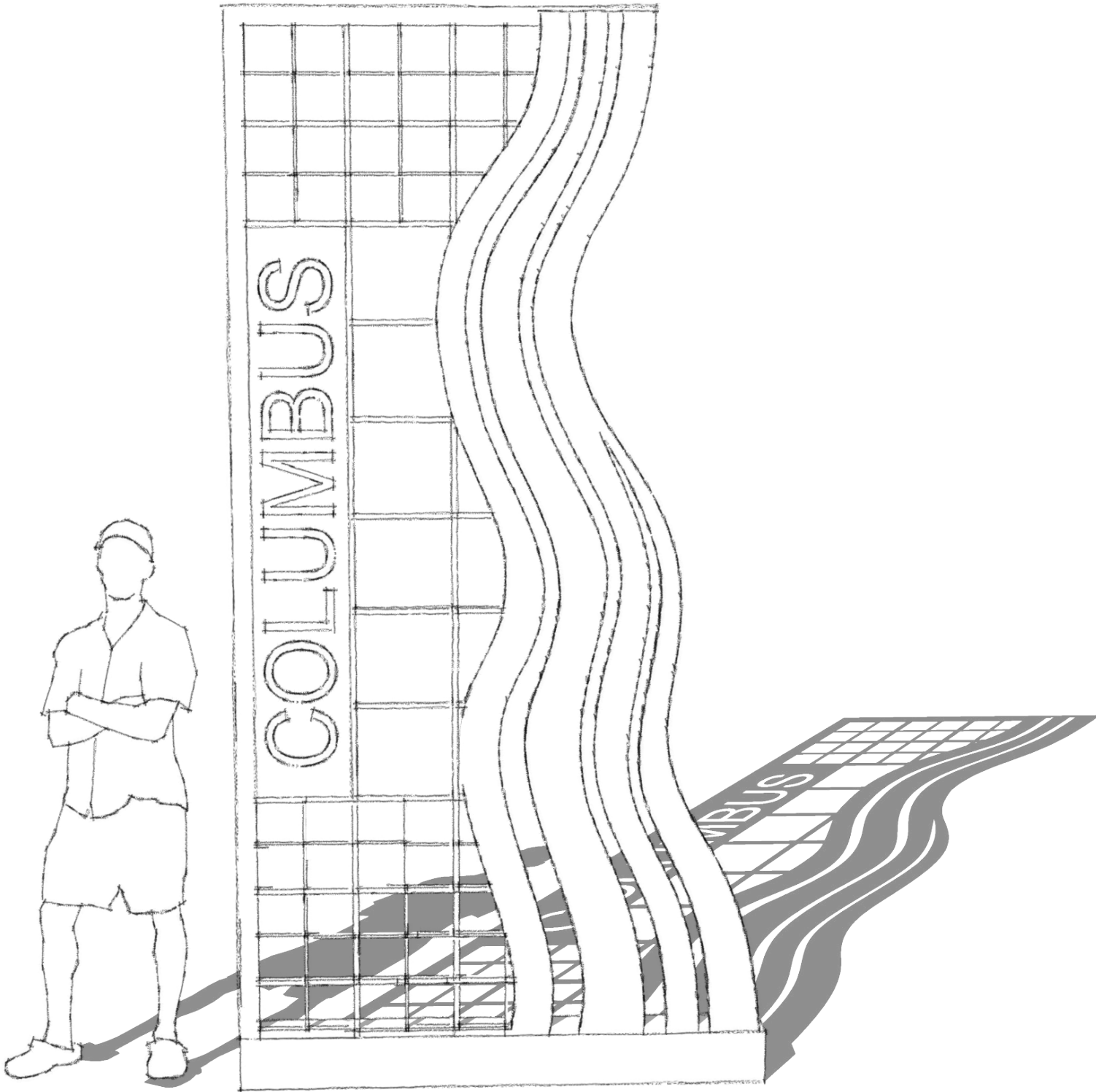


Cor-ten Steel



4.7 GATEWAY AND WAYFINDING SIGNAGE

Secondary Gateway Concept III for Consideration



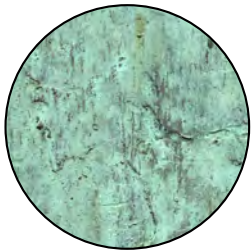
Inspiration



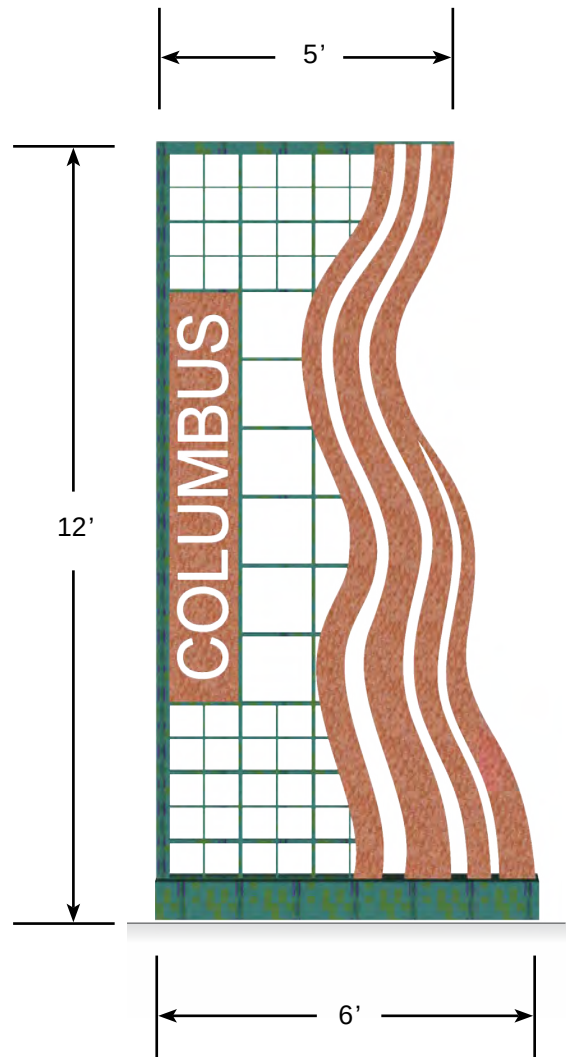
Material



Cor-ten Steel



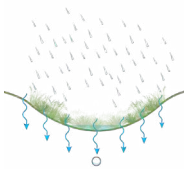
Painted Steel



4.8 GREEN INFRASTRUCTURE TOOL KIT

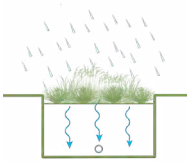
“Green infrastructure is a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits. While single-purpose gray stormwater infrastructure - conventional piped drainage and water treatment systems - is designed to move urban stormwater away from the built environment, green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.”

— United States Environmental Protection Agency



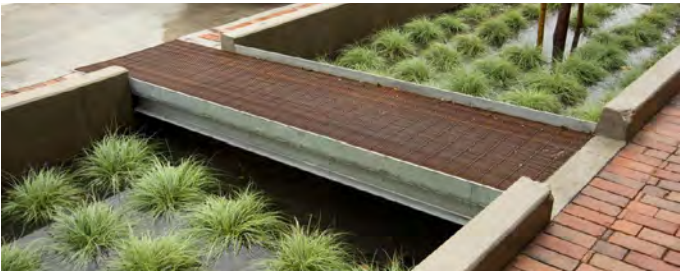
Bioretention

A planted area designed to receive and infiltrate stormwater and promote uptake by plants.



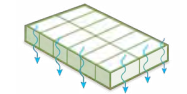
Stormwater Planter

Planters that receive stormwater runoff from an adjacent roadway or sidewalk. Planters often contain layers of gravel and soil to store stormwater, and allow it to infiltrate into soil, evaporate, or be taken up by plants.



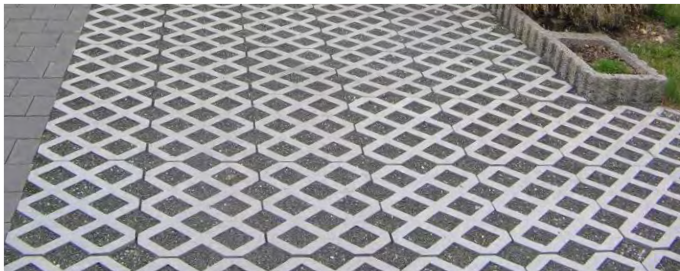
Urban Tree Canopy

Urban tree canopy is a great green infrastructure tool and have multiple benefits, including environmental benefits, economic benefits, health benefits, and social benefits.



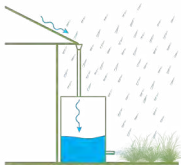
Permeable Pavements

An alternative to conventional paved surfaces that allows stormwater to drain through the surface to a layer of stone beneath.



Bioswale

A linear bioretention area that conveys stormwater while slowing its flow and promoting water uptake by plants and infiltration into the soil.



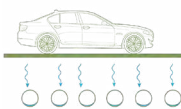
Rainwater Harvesting

Cisterns and rain barrels collect runoff from rooftops or other impervious areas, storing water for irrigation, non-potable building uses, or for slow release into an infiltration system after a storm.



Green Roofs

A layer of vegetation planted atop a waterproof membrane on a building's roof. Precipitation is captured within the growing medium, decreasing and slowing runoff.



Underground Infiltration

Systems such as modified French drains and open-bottom infiltration chambers below the soil surface. Stormwater runoff enters these systems through piped connections and is detained and allowed to infiltrate into the subsurface soil.



Downspout Disconnection

This simple practice reroutes rooftop drainage pipes from draining rainwater into the storm sewer to draining it into rain barrels, cisterns, or permeable areas.

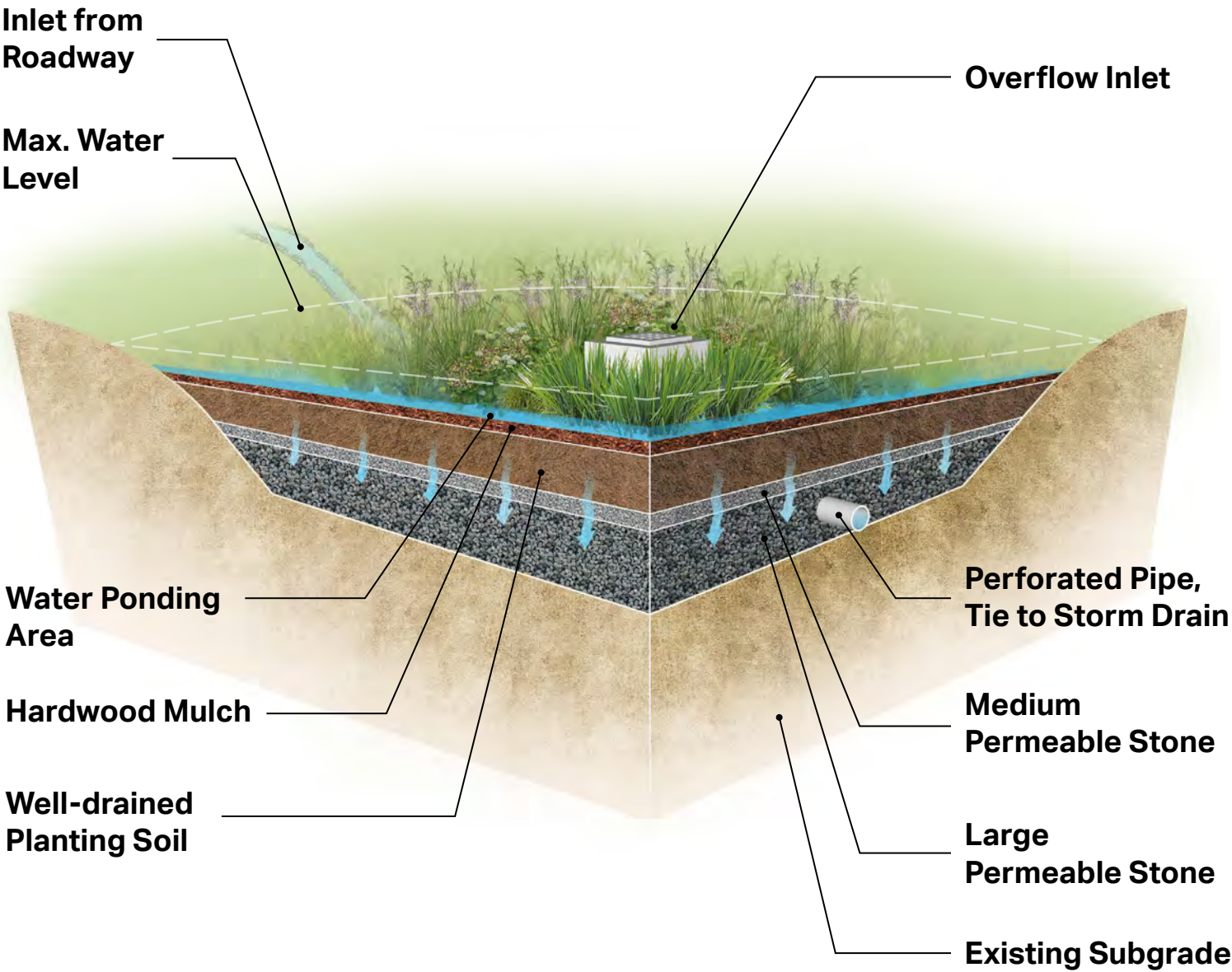


4.8 GREEN INFRASTRUCTURE TOOL KIT

Bioretention

Bioretention utilizes soils and both woody and herbaceous plants to remove pollutants from storm water runoff. Runoff passes first over or through a sand bed, which slows the runoff's velocity, distributes it evenly along the length of the ponding area, which consists of a surface organic layer and/or ground cover and the underlying planting soil. The ponding area is graded, its center depressed.

— EPA



Benefits

- Bioretention reduces amount of runoff from drainage areas.
- It is an aesthetically pleasing practice that can easily be incorporated into various landscapes.
- It is effective at removal of sediment loads, nutrients, heavy metals, etc. to enhance stormwater quality.
- It is relatively low maintenance.

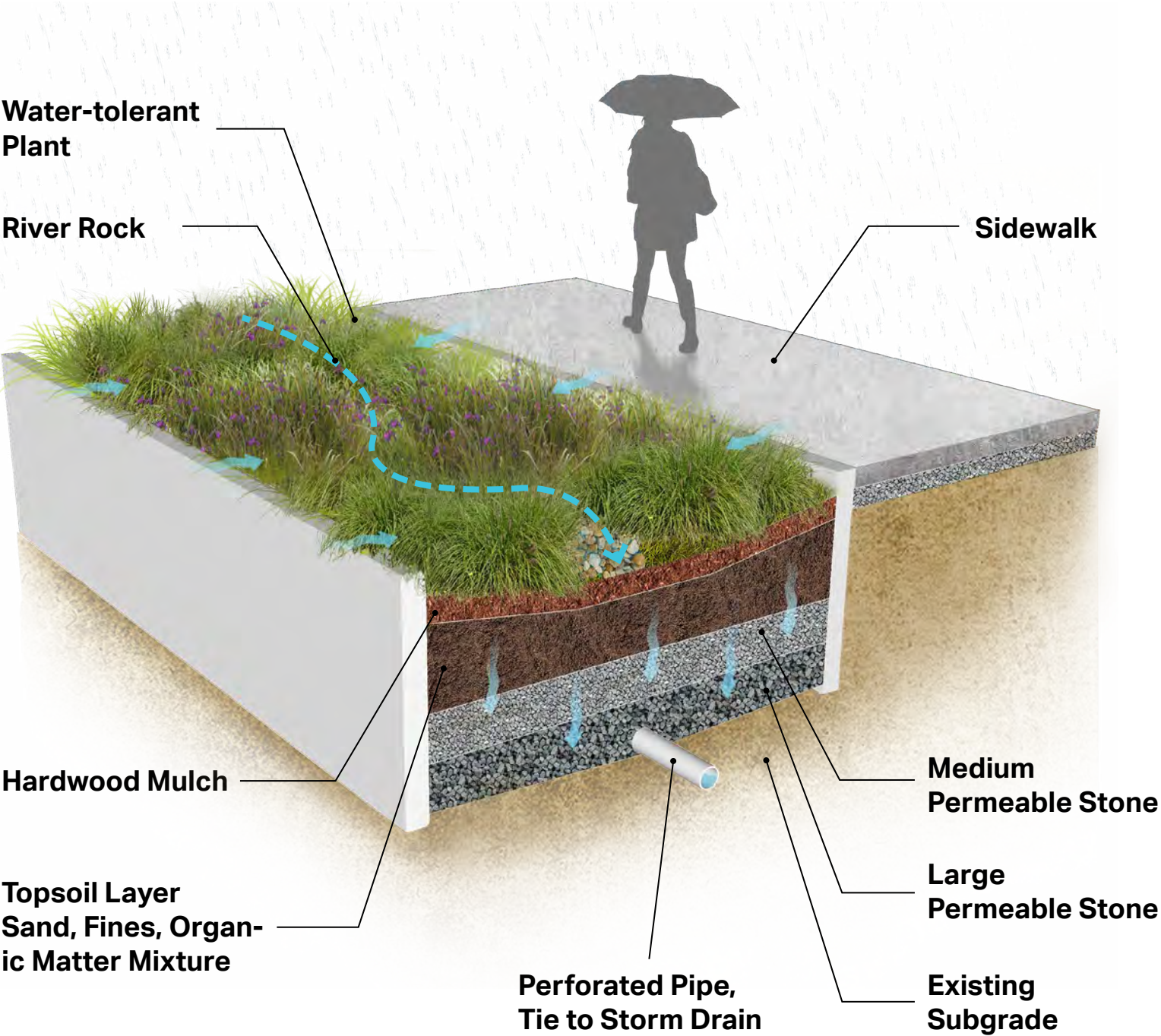


4.8 GREEN INFRASTRUCTURE TOOL KIT

Stormwater Planter

Bioretention planters are stormwater infiltration cells constructed with walled vertical sides, a flat bottom area, and a large surface capacity to capture, treat, and manage stormwater runoff from the street.

— NACTO



Benefits

- Stormwater planters offer great capacity for stormwater detention and infiltration.
- Plants can naturally treat the water by capturing and removing pollutants.
- Planters are highly adaptable to most urban contexts.
- Planters improve the aesthetic appeal of sidewalks and streets.

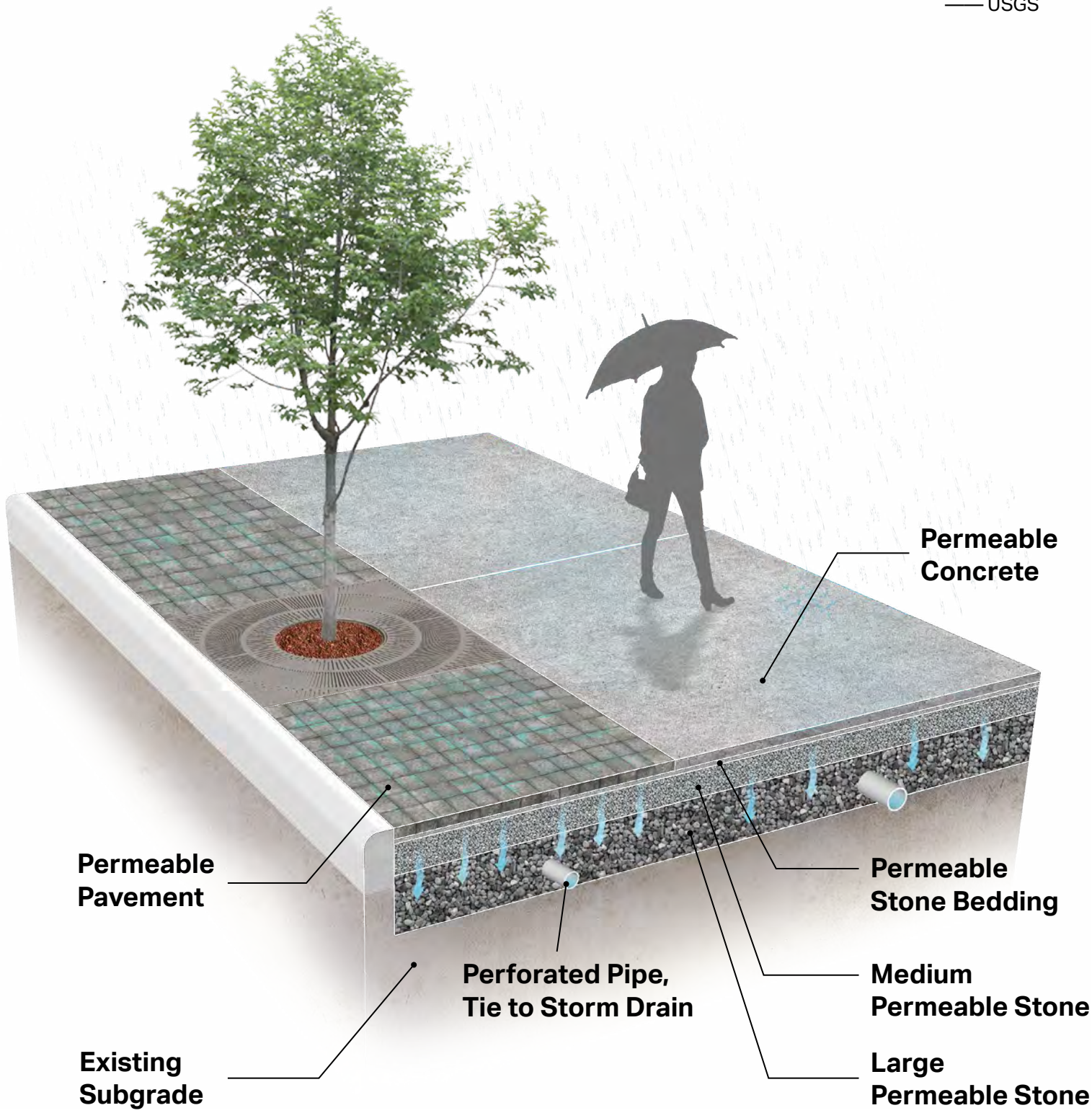


4.8 GREEN INFRASTRUCTURE TOOL KIT

Permeable Pavements

Permeable pavement is a porous urban surface composed of open pore pavers, concrete, or asphalt with an underlying stone reservoir. Permeable pavement catches precipitation and surface runoff, storing it in the reservoir while slowly allowing it to infiltrate into the soil below or discharge via a drain tile.

— USGS



Benefits

- Permeable pavements cool down the temperature of urban runoff, reducing the stress and impact on the stream or lake environment.
- Permeable pavements reduce runoff volume by trapping and slowly releasing precipitation into the ground.
- Permeable pavements reduce the need for or the required size of a regional BMP, which saves money and effort.
- Permeable pavements reduce the concentration of some pollutants.

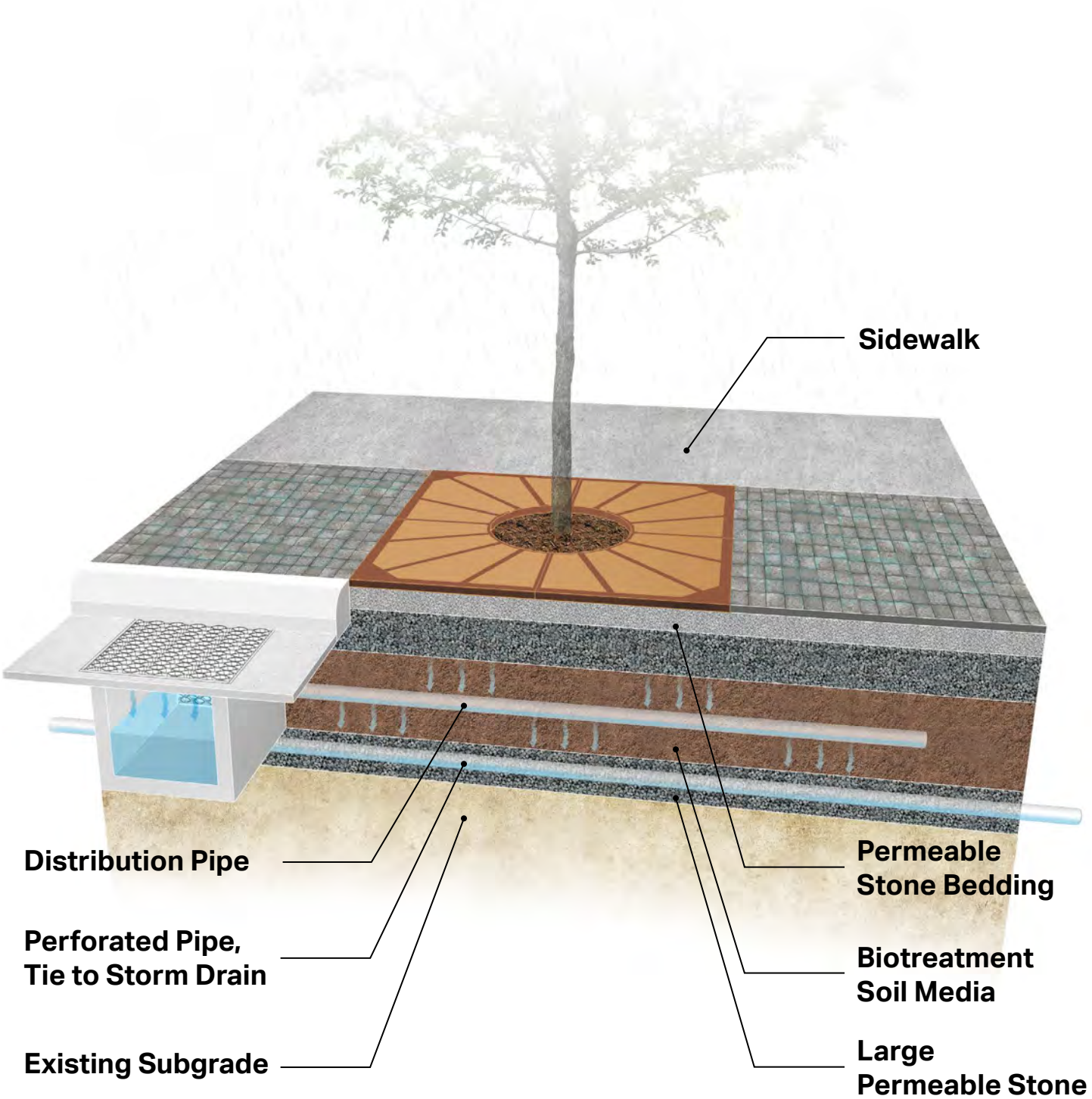


4.8 GREEN INFRASTRUCTURE TOOL KIT

Urban Tree Canopy

Trees reduce and slow stormwater by intercepting precipitation in their leaves and branches. Many cities have set tree canopy goals to restore some of the benefits of trees that were lost when the areas were developed. Homeowners, businesses, and community groups can participate in planting and maintaining trees throughout the urban environment.

— EPA



Benefits

- Street trees can contribute significantly to green stormwater management by absorbing rainfall, transpiring water, and controlling runoff.
- Street trees can help mitigate the urban heat island effect through evapotranspiration and shading.
- Street trees provide quantifiable economic and ecological value to cities.
- Street trees create immense social and aesthetic value.



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05

FUNDING AND ESTIMATION

- 5.1 Potential Funding Opportunities
- 5.2 Cost Estimate

5.1 POTENTIAL FUNDING OPPORTUNITIES

Federal

Highway Safety Improvement Program

The Highway Safety Improvement Program is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land.

State and Local Programs

Surface Transportation Program

The Surface Transportation Program provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

Transportation Alternatives Program

The Transportation Alternatives Program provides funding for projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; and safe routes to school projects.

Transportation Enhancements

The Transportation Enhancement program was established to enrich the traveling experience of motorists, bicyclists, and pedestrians through enhancements to our transportation system. Federal funding for TE projects is allotted to provide aesthetic and functional improvements to historical, natural, and scenic areas.

House Bill 170 Transportation Investment Act

The funds raised by HB 170 are earmarked to deal with the state’s mounting backlog of maintenance projects like repaving roads, fixing potholes and shoring up bridges.

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5.2 COST ESTIMATE

WITH MEDIANS FROM 32nd STREET TO TALBOTTON ROAD

ROADWAY						
Line #	Item #	Quantity	Units	Unit Price	Item Description	Total Cost
0001	150-1000	1	LS	\$ 225,000.00	TRAFFIC CONTROL	\$ 225,000.00
0002	210-0100	1	LS	\$ 400,000.00	GRADING COMPLETE	\$ 400,000.00
0003	N/A	1	LS	\$ 50,000.00	ASPHALT	\$ 50,000.00
0004	N/A	1	LS	\$ 10,000.00	TRAFFIC STRIPE	\$ 10,000.00
0005	N/A	4	EA	\$ 325,000.00	TRAFFIC SIGNAL MAST ARM	\$ 1,300,000.00
SUB TOTAL						\$1,985,000.00

STREETSCAPE						
Line #	Item #	Quantity	Units	Unit Price	Item Description	Total Cost
0006	N/A	5814	SF	\$ 30.10	RAISED MEDIANS (BRICK PAVER, COATING, CONCRETE)	\$ 175,001.40
0007	900-0039	9450	SF	\$ 15.50	REGULAR BRICK PAVER (FURNITURE ZONE)	\$ 146,475.00
0008	900-0045	1050	SY	\$ 7.50	MORTAR SET BED FOR BRICK PAVERS, 1 1/2".	\$ 7,875.00
0009	441-0104	10350	SY	\$ 40.00	CONC SIDEWALK, 4 IN.	\$ 414,000.00
0010	441-0016	1834	SY	\$ 48.00	DRIVEWAY CONCRETE, 6 IN TK	\$ 88,032.00
0011	N/A	110	EA	\$ 500.00	ADA RAMP	\$ 55,000.00
0012	310-1101	6097	TN	\$ 35.00	GR AGGR BASE CRS, INCL MATL	\$ 213,395.00
0013	441-6216	35770	LF	\$ 18.00	CONC CURB & GUTTER, 8 IN X 24 IN, TP 2	\$ 643,860.00
0014	N/A	290	EA	\$ 2,100.00	PEDESTRIAN LIGHT (FOUNDATION AND WIRING ONLY)	\$ 609,000.00
0015	N/A	68	EA	\$ 3,000.00	ROADWAY LIGHT (FOUNDATION AND WIRING ONLY)	\$ 204,000.00
0016	687-1000	20	EA	\$ 13,000.00	PEDESTRIAN ACTIVATED SIGNAL	\$ 260,000.00
0017	754-5000	66	EA	\$ 2,500.00	6" BENCH	\$ 165,000.00
0018	754-6000	20	EA	\$ 1,200.00	BICYCLE RACK	\$ 24,000.00
0019	754-4000	34	EA	\$ 1,200.00	WASTE RECEPTACLE UNIT	\$ 40,800.00
0020	999-0100	10	EA	\$ 10,000.00	BUS SHELTER	\$ 100,000.00
0021	N/A	260	EA	\$ 850.00	SHADE TREES	\$ 221,000.00
0022	N/A	111	EA	\$ 375.00	FLOWERING TREES	\$ 41,625.00
0023	N/A	83836	EA	\$ 5.00	GROUNDCOVER	\$ 419,180.00
0024	702-9025	18751	SY	\$ 7.92	FINE, SHREDDED HARDWOOD MULCH WITH BINDER	\$ 148,507.92
0025	708-1000	2084	CY	\$ 50.00	PLANT TOPSOIL (4 in depth)	\$ 104,200.00
SUB TOTAL						\$4,080,951.32

ALLOWANCES -% of TOTAL CONSTRUCTION				
Erosion Control		0.30%		\$ 18,197.85
Misc.		1.00%		\$ 60,659.51
Utilities		7.00%		\$ 424,616.59
Drainage		10.00%		\$ 606,595.13
SUB TOTAL				\$1,110,069.09
			O&P 15%	\$ 1,076,403.06
			CONTINGENCY 20%	\$ 1,435,204.08
			TOTAL	\$9,687,627.56

ALTERNATES						
Line #	Item #	Quantity	Units	Unit Price	Item Description	Total Cost
0026	999-0100	5	LS	\$ 40,000.00	GATEWAY FEATURE	\$ 200,000.00

NOTE

- Engineering , Inspection and Design Costs are not included in total costs.
- Project Management Costs are not included in the total costs.
- Cost Estimate does not include property acquisitions.
- Cost Estimate does not include the price of relocating overhead or underground facilities.
- All Item quantities and associated costs are based on concept plans and are approximate only. No field survey was conducted.
- AECOM does not have control over the cost of labor, materials, equipment, or over the Contractor’s method of costing in the market-place. The opinion of probable cost as herein stated is made on the basis of our experience and qualifications and represent our best judgment as a design professional familiar with the construction industry. However, we can not guarantee that bids or the construction cost will not vary from these probable cost opinions. If the Owner desires greater assurance of the cost of construction, it is recommended he employ an independent cost estimator.

WITHOUT MEDIANS FROM 32nd STREET TO TALBOTTON ROAD

ROADWAY						
Line #	Item #	Quantity	Units	Unit Price	Item Description	Total Cost
0001	150-1000	1	LS	\$ 150,000.00	TRAFFIC CONTROL	\$ 150,000.00
0002	210-0100	1	LS	\$ 275,000.00	GRADING COMPLETE	\$ 275,000.00
0003	N/A	1	LS	\$ 50,000.00	ASPHALT	\$ 50,000.00
0004	N/A	1	LS	\$ 10,000.00	TRAFFIC STRIPE	\$ 10,000.00
0005	N/A	4	EA	\$ 325,000.00	TRAFFIC SIGNAL MAST ARM	\$ 1,300,000.00
SUB TOTAL						\$1,785,000.00

STREETSCAPE						
Line #	Item #	Quantity	Units	Unit Price	Item Description	Total Cost
0006	N/A	4463	SF	\$ 30.10	RAISED MEDIANS (BRICK PAVER, COATING, CONCRETE)	\$ 134,336.30
0007	900-0039	9450	SF	\$ 15.50	REGULAR BRICK PAVER (FURNITURE ZONE)	\$ 146,475.00
0008	900-0045	1050	SY	\$ 7.50	MORTAR SET BED FOR BRICK PAVERS, 1 1/2".	\$ 7,875.00
0009	441-0104	9513	SY	\$ 40.00	CONC SIDEWALK, 4 IN.	\$ 380,520.00
0010	441-0016	2006	SY	\$ 48.00	DRIVEWAY CONCRETE, 6 IN TK	\$ 96,288.00
0011	N/A	103	EA	\$ 500.00	ADA RAMP	\$ 51,500.00
0012	310-1101	5383	TN	\$ 35.00	GR AGGR BASE CRS, INCL MATL	\$ 188,405.00
0013	441-6216	29604	LF	\$ 18.00	CONC CURB & GUTTER, 8 IN X 24 IN, TP 2	\$ 532,872.00
0014	N/A	292	EA	\$ 2,100.00	PEDESTRIAN LIGHT (FOUNDATION AND WIRING ONLY)	\$ 613,200.00
0015	N/A	68	EA	\$ 3,000.00	ROADWAY LIGHT (FOUNDATION AND WIRING ONLY)	\$ 204,000.00
0016	687-1000	20	EA	\$ 13,000.00	PEDESTRIAN ACTIVATED SIGNAL	\$ 260,000.00
0017	754-5000	66	EA	\$ 2,500.00	6" BENCH	\$ 165,000.00
0018	754-6000	20	EA	\$ 1,200.00	BICYCLE RACK	\$ 24,000.00
0019	754-4000	34	EA	\$ 1,200.00	WASTE RECEPTACLE UNIT	\$ 40,800.00
0020	999-0100	10	EA	\$ 10,000.00	BUS SHELTER	\$ 100,000.00
0021	N/A	263	EA	\$ 850.00	SHADE TREES	\$ 223,550.00
0022	N/A	108	EA	\$ 375.00	FLOWERING TREES	\$ 40,500.00
0023	N/A	91070	EA	\$ 5.00	GROUNDCOVER	\$ 455,350.00
0024	702-9025	20297	SY	\$ 7.92	FINE, SHREDDED HARDWOOD MULCH WITH BINDER	\$ 160,752.24
0025	708-1000	2256	CY	\$ 50.00	PLANT TOPSOIL (4 in depth)	\$ 112,800.00
SUB TOTAL						\$3,938,223.54

ALLOWANCES -% of TOTAL CONSTRUCTION				
Erosion Control		0.30%		\$ 17,169.67
Misc.		1.00%		\$ 57,232.24
Utilities		7.00%		\$ 400,625.65
Drainage		10.00%		\$ 572,322.35
SUB TOTAL				\$1,047,349.91
			O&P 15%	\$ 1,015,586.02
			CONTINGENCY 20%	\$ 1,354,114.69
			TOTAL	\$9,140,274.15

ALTERNATES						
Line #	Item #	Quantity	Units	Unit Price	Item Description	Total Cost
0026	999-0100	5	LS	\$ 40,000.00	GATEWAY FEATURE	\$ 200,000.00

NOTE

- Engineering , Inspection and Design Costs are not included in total costs.
- Project Management Costs are not included in the total costs.
- Cost Estimate does not include property acquisitions.
- Cost Estimate does not include the price of relocating overhead or underground facilities.
- All Item quantities and associated costs are based on concept plans and are approximate only. No field survey was conducted.
- AECOM does not have control over the cost of labor, materials, equipment, or over the Contractor’s method of costing in the market-place. The opinion of probable cost as herein stated is made on the basis of our experience and qualifications and represent our best judgment as a design professional familiar with the construction industry. However, we can not guarantee that bids or the construction cost will not vary from these probable cost opinions. If the Owner desires greater assurance of the cost of construction, it is recommended he employ an independent cost estimator.



06

APPENDIX

- 6.1 Data Collection Locations
- 6.2 Pedestrian Study
- 6.3 Traffic Counts and Growth Rate
- 6.4 Right-Sizing Policy Examples
- 6.5 Case Studies

6.1 DATA COLLECTION LOCATIONS

Proposed Count Locations



Proposed Pedestrian Count Locations



Location1

2nd Avenue between 20th Street and 21st Street is a four lane Urban Principal Arterial along this section of the roadway with a speed limit of 35 mph. 2nd Avenue has 11-12 ft lanes with curb and gutter on either side of the roadway. 2nd Avenue serves a substantial amount of commuter traffic during the weekdays in both AM and PM peak periods, as well as regional and local trips throughout the day with a current Annual Average Daily Traffic (AADT) of 19,900 vehicles per day. A railroad crossing is present across 2nd Avenue at its intersection with 20th Street. 20th Street - a two-lane local public road connecting residences along 1st Avenue on the west and 3rd Avenue on the east. Motorists are not allowed to enter or exit 20th Street east of 2nd Avenue due to the railroad junction. 21st Street is also a two-lane local public road that connects residences along 1st Avenue on the west and the commercial establishments along the east side of 2nd Avenue. There is a Metra bus stop that is located along this section of the corridor. There are sidewalks with grass buffers on both sides of 2nd Avenue and there are no marked crosswalks along this section of the study corridor, except across the west leg of 20th Street. The nearest marked signalized crosswalk for pedestrians to cross 2nd Avenue is located at the intersection of 2nd Avenue and Talbotton Road, approximately 750 ft south of the study section. The west side of 2nd Avenue is a multi-family residential property and the east side is a commercial establishment.

Location2

2nd Avenue between 24th Street and 25th Street is a four-lane Urban Principal Arterial along this section of the roadway with a speed limit of 35 mph. 2nd Avenue has 11-12 ft lanes with curb and gutter on either side of the roadway. It serves a substantial amount of commuter traffic during the weekdays in both AM and PM peak periods, as well as regional and local trips throughout the day with a current AADT of 21,600 vehicles per day. 24th Street is a two-lane local public road that connects residences along 1st Avenue on the west and the commercial establishments along the east side of 2nd Avenue. 25th Street is also a two-lane local public road connecting residences and commercial establishments along 2nd Avenue on the east and the residences on the west side of 4th Avenue on the east. There are two Metra bus stops located along this section of the corridor. There are sidewalks with grass buffers on both sides of 2nd Avenue and there are no marked crosswalks along this section of the study corridor. The nearest marked signalized crosswalk for pedestrians

6.1 DATA COLLECTION LOCATIONS

to cross 2nd Avenue is located at the intersection of 2nd Avenue and Talbotton Road, approximately 2,000 ft south of the study section. The west side of 2nd Avenue consists of a community house, Cornerstone Full Gospel Church and a commercial establishment. The east side of 2nd Avenue consists of a commercial lot and the McLlhenny Elementary School.

■ **Location 3**

2nd Avenue between 29th Street and 30th Street is a four-lane Urban Principal Arterial along this section of the roadway with a speed limit of 35 mph. 2nd Avenue has 10-11 ft lanes with curb and gutter on either side of the roadway. 2nd Avenue serves a substantial amount of commuter traffic during the weekdays in both AM and PM peak periods, as well as regional and local trips throughout the day with a current AADT of 21,600 vehicles per day. 29th Street is a two-lane local public road connecting residences along 1st Ave on the west and the residences on 9th Avenue on the east. 30th Street is also a two-lane local public road that connects residences along 1st Avenue on the west and the commercial establishments along the east side of 2nd Avenue. There are two Metra bus stops located along this section of the corridor. There are sidewalks with grass buffers on both sides of 2nd Avenue and there are no marked crosswalks along this section of the study corridor, except across the west leg of 29th Street. The nearest marked signalized crosswalk for pedestrians to cross 2nd Avenue is located at the intersection of 2nd Avenue and 35th Street, approximately 2,000 ft north of the study section. The west side of 2nd Avenue consists of a charity establishment called Valley Rescue Mission and the east side of 2nd Avenue consists of Second Baptist Church along with some commercial properties that include an automotive service and a coffee shop.

■ **Location 4**

2nd Avenue between 30th Street and 32nd Street is a four-lane Urban Principal Arterial along this section of the roadway with a speed limit of 35 mph. 2nd Avenue has 10-11 ft lanes with curb and gutter on either side of the roadway. 2nd Avenue serves a substantial amount of commuter traffic during the weekdays in both AM and PM peak periods, as well as regional and local trips throughout the day with a current AADT of 18,900 vehicles per day. 32nd Street is a two-lane local public road that connects residences along 1st Avenue on the west and the residences along 9th Avenue. There are two Metra bus stops located along this section of the corridor (one on either side). There are sidewalks with grass buffers on both sides of 2nd Avenue and there are no marked crosswalks along this section of the study corridor, except along the east and west leg of 32nd Street. The nearest marked signalized crosswalk for pedestrians to cross 2nd Avenue is located at the intersection of 2nd Avenue and 35th Street, approximately 1,200 ft north of the study section. The east and west side of 2nd Avenue along this study section consists of commercial establishments and a bar.

■ **Location 5**

2nd Avenue between 38th Street and 40th Street is a five-lane Urban Principal Arterial with a two-way left turn lane along this section of the roadway with a speed limit of 35 mph. 2nd Avenue has 11-12 ft lanes with curb and gutter on either side of the roadway. 2nd Avenue serves a substantial amount of commuter traffic during the weekdays in both AM and PM peak periods, as well as regional and local trips throughout the day with a current AADT of 18,900 vehicles per day. 38th Street is a two-lane local public road that connects residences and warehouses along 1st Avenue on the west and the residences and Fox Elementary School along 6th Avenue. There are two Metra bus stops located along this section of the corridor (one on either side). There are sidewalks with grass buffers on both sides of 2nd Avenue. There are marked crosswalks along this section of the study corridor at its intersection with 38th Street and 40th Street. The east side of 2nd Avenue along this study section consists mostly of single-family residential houses and west side of 2nd Avenue consists mostly of commercial establishments and some single-family residential houses.

■ **Location 6**

2nd Avenue between 43rd Street and 44th Street is a five-lane Urban Principal Arterial with a two-way left turn lane along this section of the roadway with a speed limit of 35 mph. 2nd Avenue has 11-12 ft lanes with curb and gutter on either side of the roadway. 2nd Avenue serves a substantial amount of commuter traffic during the weekdays in both AM and PM peak periods, as well as regional and local trips throughout the day with a current AADT of 21,900 vehicles per day. 43rd Street is a short segment of a two-lane local public road that intersects 2nd Avenue on the east side and does not allow motorists to and from 2nd Street. 43rd Street connects residences along this roadway to 3rd Avenue. 44th Street connects 2nd Avenue to the residential neighborhood west of 2nd Avenue as well as to the residences along 3rd Avenue to the east. There are two Metra bus stops located along this section of the corridor (one on either side). There are sidewalks with grass buffers on both sides of 2nd Avenue. There are no marked crosswalks along this section of the study corridor. The nearest crosswalk across 2nd Avenue is at its intersection with Manchester Expressway, approximately 600 ft from this study location. The west side of 2nd Avenue along this study section consists of the Bridge Church and east side of 2nd Avenue consists mostly of commercial establishments and a church.

6.2 PEDESTRIAN STUDY

Traffic and Pedestrian Volumes

The peak hour volume for pedestrians was determined for each study location and then compared to the traffic volumes collected for the nearest location for the same peak hour. These volumes were then compared to Figure 4F-1 (page 203) of the MUTCD, Guidelines for the Installation of Pedestrian Hybrid Beacons (PHB) on Low-Speed Roadway. Table 1 shows the pedestrian volume at each of the study locations and the corresponding traffic volumes.

TABLE 1: Peak Hour Pedestrian Volumes and Corresponding Traffic Volumes

Study Location	Peak Hour	Maximum Observed Pedestrian Volumes (ped/hour)	2 nd Ave (veh/hr)	2 nd Ave (veh/hr)	2 nd Ave (veh/hr)
		East/West	Northbound	Southbound	Total
Location 1: Between 20th St and 21st St	4:00 PM to 5:00 PM	6	1056	497	1553
Location 2: Between 24th St and 25th St	12:30 PM to 1:30 PM	7	1056	497	1553
Location 3: Between 29th St and 30th St	3:15 PM to 4:15 PM	17	925	585	1510
Location 4: Between 30th St and 32nd St	9:30 AM to 10:30 AM	3	925	585	1510
Location 5: Between 38th St and 40th St	4:00 PM to 5:00 PM	1	1043	542	1585
Location 6: Between 43rd St and 44th St	3:45 PM to 4:45 PM	11	982	605	1587

The warrants for PHBs are outlined in the MUTCD, Chapter 4, Section F. This section provides the application, design, and operation of PHBs. MUTCD guidance states that a pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings. The graph in Figure 4F-1 (page 203) of the MUTCD provides the baseline volume requirements for the consideration of a PHB. According to Section 4F, the need for a PHB should be considered if an engineering study finds that the plotted point representing vehicles per hour on the major street and the corresponding total of all pedestrians crossing the major street for one-hour of an average day falls above the applicable curve in Figure 4F-1 (page 203) for the length of the crosswalk.

According to the PHB warrants in MUTCD, 20 pedestrians per hour is the lowest pedestrian volume threshold required for the location to meet PHB warrants for a major street with vehicular volumes between 1,250 vehicles per hour and 1,750 vehicles per hour. None of the studied locations along 2nd Avenue were observed to meet the required pedestrian volumes. 2nd Avenue between 29th Street and 30th Street (Location 3) comes close to meeting the warrants with 17 pedestrians per hour.

According to GDOT Pedestrian and Streetscape guide (PSG), the number of pedestrians crossing the segment of roadway or corridor under evaluation may be used to support the recommendation for a pedestrian crossing at an uncontrolled location. The pedestrian volume thresholds are generally as follows:

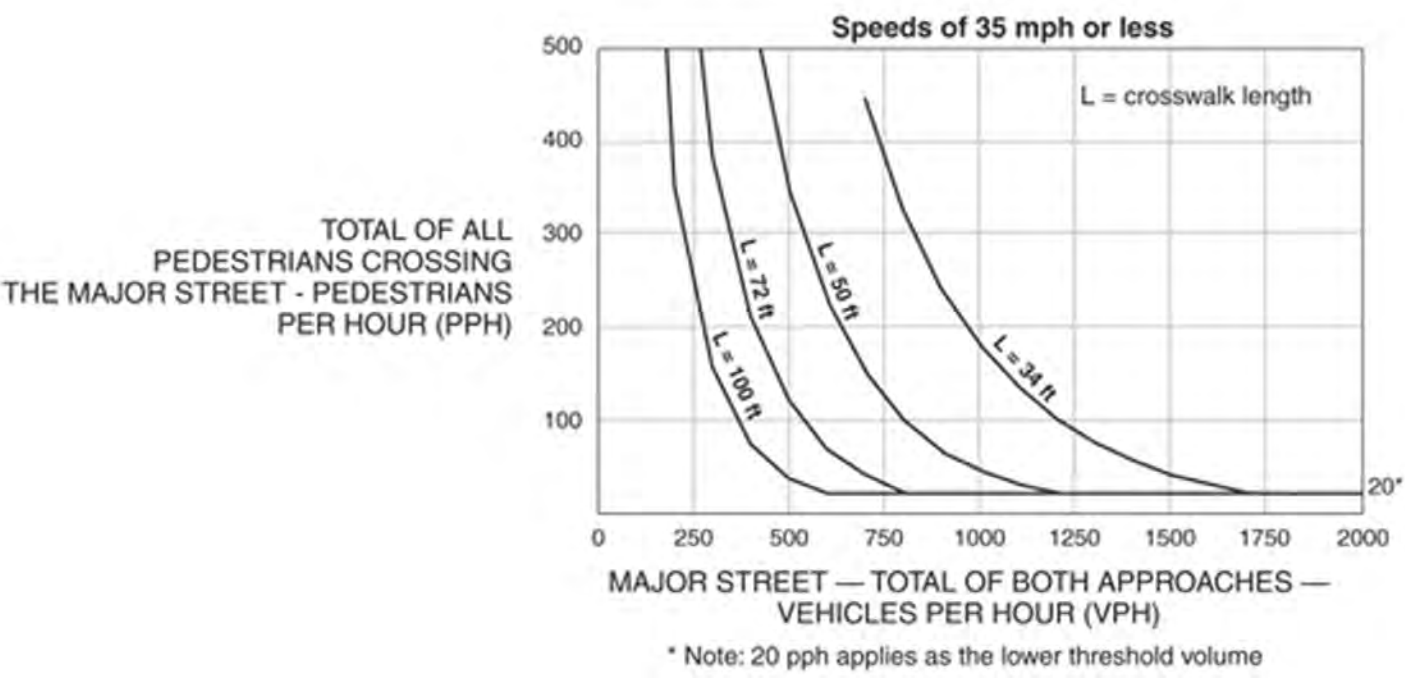
- 20 pedestrians per hour in any one hour, or
- 18 pedestrians per hour in any two hours, or
- 15 pedestrians per hour in any three hours

The pedestrian volume crossing 2nd Avenue between 29th Street and 30th Street (Location 3) has 15 pedestrians per hour in any three hours and therefore meets the GDOT pedestrian volume thresholds to support the recommendation for a pedestrian crossing at an uncontrolled location.

Although the other locations do not meet the volume requirement for a PHB, the GDOT PSG recommends consideration of a Rectangular Rapid Flashing Beacon (RRFB) with marked crosswalks RRFBs may be installed on roadways with a speed limit of 35 mph or less and may be installed on two-way streets with three or fewer lanes in each direction. Hence, this study has also evaluated the following locations for an RRFB due to the volume of pedestrians crossing the street at mid-block locations since these locations appear to have a volume of at least five pedestrian per hour:

- 2nd Avenue between 20th Street and 21st Street (Location 1)
- 2nd Avenue between 24th Street and 25th Street (Location 2)
- 2nd Avenue between 43rd Street and 44th Street (Location 6)

Figure 4F-1. Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways



6.2 PEDESTRIAN STUDY

Pedestrian Crash History

Pedestrian crashes for each of the study locations has been evaluated from the year 2014 to 2018 and is presented in Table 2 below:

TABLE 2: Pedestrian Crash Data at Study Locations (2014-2018)

Study Location	PDO Crashes	Injury Crashes	Fatal Crashes	Total Crashes	Distance from study location
Location 1: Between 20th St and 21st St	0	0	0	0	-
Location 2: Between 24th St and 25th St	0	0	1	1	75 ft north of the intersection of 2 nd Ave and 24 th St.
Location 3: Between 29th St and 30th St	0	0	0	0	-
Location 4: Between 30th St and 32nd St	0	0	0	0	-
Location 5: Between 38th St and 40th St	0	1	0	1	At the intersection of 2 nd Ave and 38 th St
Location 6: Between 43rd St and 44th St	0	0	0	0	-

One fatal crash occurred along 2nd Avenue between 24th Street and 25th Street (Location 2). This crash was caused by a vehicle striking a pedestrian crossing mid-block on 2nd Avenue. There was an injury crash at the intersection of 2nd Avenue and 38th Street (Location 5). This was caused by a vehicle failing to yield to a pedestrian in the crosswalk of 38th Street. Apart from these two crashes, no other crashes were found at the study location between 2014 and 2018.

Mid-block Pedestrian Crossing Evaluation

This section is to evaluate the placement of pedestrian crossings, and to select traffic control and other design elements at the study location. Evaluation steps are referred to the Appendix 6.1 of GDOT Pedestrian and Streetscape Guide (PSG). A full evaluation document is attached as the Appendix 6.1 of this report.

Step 1: Review GDOT Complete Streets Policy

The GDOT Complete Streets Policy establishes standards and guidelines for when to incorporate bicycle, pedestrian, and transit accommodations into transportation infrastructure projects.

Step 2: Field Data and Observation

In order to make selection of crossing treatments in steps 3 and 4, data collection and field observation need to be obtained.

Step 3: Evaluate Crossing Location

This section presents the criteria to consider when recommending a pedestrian crossing be installed along the segment of roadway or corridor and when determining where along the segment of roadway or corridor a pedestrian crossing may be installed. The placement of marked pedestrian crossings at uncontrolled locations depends on several factors, including but not limited to adjacent land uses, pedestrian behavior, current and projected pedestrian volumes, proximity to other marked crossings, presence of a transit stop or shared path, and stopping sight distance.

Step 4: Select the Pedestrian Crossing Treatment

The Table A-9 (see Figure 1 below) in the GDOT Pedestrian and Streetscape Guide (PSG) provides the baseline guide for evaluating treatment types given the vehicle volumes, vehicle speed, and roadway configuration at the study location.

Figure 1: FHWA Pedestrian Crossing Treatment Recommendation

Roadway Configuration	Speed Limit								
	≤30 mph			35 mph			≥40 mph		
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
2 lanes*	① 2 3 4 5 6	① ③ 5 6 7	① ③ 5 6 ⑦	① 3 4 5 6	① ③ 5 6 7	① ③ 5 6 ⑦	① 3 4 5 6 7	① ③ 5 6 7	① ③ 5 6 ⑦
3 lanes with raised median*	① 2 3 4 5	① ③ 5 7	① ③ 5 ⑦	① 3 4 5 7	① ③ 5 ⑦	① ③ 5 ⑦	① ③ 4 5 7	① ③ 5 ⑦	① ③ 5 ⑦
3 lanes w/o raised median†	① 2 3 4 5 6 7	① ③ 5 6 7	① ③ 5 6 ⑦	① 3 4 5 6 7	① ③ 5 6 ⑦	① ③ 5 6 ⑦	① ③ 4 5 6 7	① ③ 5 6 ⑦	① ③ 5 6 ⑦
4+ lanes with raised median‡	① ③ 5	① ③ 5 7	① ③ 5 ⑦	① ③ 5 7	① ③ 5 ⑦	① ③ 5 ⑦	① ③ 5 ⑦	① ③ 5 ⑦	① ③ 5 ⑦
4+ lanes w/o raised median‡	① ③ 5 6 7 8	① ③ 5 ⑥ 7 8	① ③ 5 ⑥ ⑦ 8	① ③ 5 6 7 8	① ③ 5 ⑥ ⑦ 8	① ③ 5 ⑥ ⑦ 8	① ③ 5 ⑥ ⑦ 8	① ③ 5 ⑥ ⑦ 8	① ③ 5 ⑥ ⑦ 8

*One lane in each direction †One lane in each direction with two-way left-turn lane ‡Two or more lanes in each direction

Given the set of conditions in a cell,

- ① Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- High-visibility crosswalk markings, parking restriction on crosswalk approach, adequate nighttime lighting levels
- Raised crosswalk
- Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- In-Street Pedestrian Crossing sign
- Curb extension
- Pedestrian refuge island
- Pedestrian Hybrid Beacon
- Road Diet

This table was developed using information from: Zegeer, C. V., Stewart, J. R., Huang, H. H., Lagerwey, P. A., Feaganes, J., & Campbell, B. J. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines (No. FHWA-HRT-04-100); Manual on Uniform Traffic Control Devices, 2009 Edition, Chapter 4F. Pedestrian Hybrid Beacons; the Crash Modification Factors (CMF) Clearinghouse website (<http://www.cmfclearinghouse.org/>); and the Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE) website (<http://www.pedbikesafe.org/PEDSAFE/>).

2nd Avenue is a 4+ lane undivided roadway with a posted speed limit of 35 mph and an average AADT of 21,000 veh/day. Therefore, according to the FHWA Pedestrian Crossing Treatment Recommendation and existing condition of the study location, the recommended treatments can be summarized as below:

- High visibility crosswalk
- Advance Stop Here for Pedestrians sign
- Curb extension
- Pedestrian refuge island
- PHB
- Road diet

6.2 PEDESTRIAN STUDY

Conclusion

2nd Avenue between 20th Street and 21st Street (Location 1) has six pedestrians crossing during the peak hour. This location has a multi-family residential building and a Metra bus stop on the east side of 2nd Avenue that may contribute to pedestrians crossing at this location. Therefore, this location was identified to be a suitable location for a mid-block pedestrian crossing.

2nd Avenue between 24th Street and 25th Street (Location 2) has seven pedestrians crossing during the peak hour and one fatal crash in the last five years caused by a pedestrian crossing mid-block in this section. This location has a church, community center and a Metra bus stop on the west side of 2nd Avenue. The Metra bus stop and school on the east side of 2nd Avenue may also contribute to pedestrians crossing at this location. Therefore, this location was identified to be a suitable location for a mid-block pedestrian crossing.

2nd Avenue between 29th Street and 30th Street (Location 3) was determined to have significant pedestrian crossings (17 for one hour and 15 in three hours) to indicate that a mid-block pedestrian crossing would be prudent. There are two Metra bus stops located along this section of the corridor, a charity establishment called Valley Rescue Mission, the Second Baptist Church and a coffee shop in this location that might contribute to the high pedestrian crossing volumes.

2nd Avenue between 30th Street and 32nd Street (Location 4) was determined to have low pedestrian crossing volumes (three in one hour) and no pedestrian-related crashes in this segment. Therefore, this location was not considered for a mid-block pedestrian crossing.

2nd Avenue between 38th Street and 40th Street (Location 5) was determined to have the lowest pedestrian crossing volumes (one in one hour) among all the studied locations. This location had one pedestrian injury crash caused by a pedestrian crossing the signalized crosswalk across the west leg of 38th Street at its intersection with 2nd Avenue. Therefore, this location was not considered for a mid-block pedestrian crossing due to the low counts and lack of crash data.

2nd Avenue between 43rd Street and 44th Street (Location 6) has 11 pedestrians crossing during the peak hour. This location has a church and a Metra bus stop on the west side of 2nd Avenue. The Metra bus stop and church on the east side of 2nd Avenue may also contribute to pedestrians crossing at this location. Therefore, a mid-block pedestrian crossing with a high visibility crosswalk, a pedestrian refuge island and an RRFB should be considered at this location.

Conclusion

The study recommends an RRFB to be considered at the following locations due to the observed pedestrian crossing activity and the pedestrian fatality observed in the last five years:

- Location 1: 2nd Avenue between 20th Street and 21st Street near the Metra bus stop
- Location 2: 2nd Avenue between 24th Street and 25th Street between the Metra bus stops
- Location 6: 2nd Avenue between 43rd Street and 44th Street at the Bridge Church

The study recommends considering a PHB along 2nd Avenue between 29th Street and 30th Street (Location 3) at the Metra bus stops as this location has the highest pedestrian activity among the studied locations and also meets the GDOT recommended pedestrian volume thresholds to add a mid-block pedestrian crossing.

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6.3 TRAFFIC COUNTS AND GROWTH RATE

Project ID: 20-09035-001
Location: SR 85/2nd Ave & Talbotton Rd
City: Columbus

Day: Tuesday
Date: 02/04/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks																									
	SR 85/2nd Ave Northbound						SR 85/2nd Ave Southbound						Talbotton Rd Eastbound						Talbotton Rd Westbound						
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
6:00 AM	0	14	2	0	0	16	29	27	0	0	0	56	0	0	0	0	0	0	6	0	9	0	0	15	87
6:15 AM	0	14	4	0	0	18	63	44	0	0	0	107	0	0	0	0	0	0	6	0	7	0	0	13	138
6:30 AM	0	42	7	0	0	49	70	60	0	0	0	130	0	0	0	0	0	0	8	0	9	0	0	17	196
6:45 AM	0	30	5	0	1	35	76	91	0	0	0	167	0	0	0	0	1	0	13	0	16	0	0	29	231
Total	0	100	18	0	1	118	238	222	0	0	0	460	0	0	0	0	1	0	33	0	41	0	0	74	652
7:00 AM	0	49	15	0	0	64	65	158	0	0	0	223	0	0	0	0	0	0	8	0	26	1	1	35	322
7:15 AM	0	59	20	0	0	79	79	186	0	0	0	265	0	0	0	0	0	0	25	0	25	0	0	50	394
7:30 AM	0	97	17	0	0	114	114	267	0	0	0	381	0	0	0	0	0	0	33	0	27	0	0	60	555
7:45 AM	0	97	23	0	0	120	123	320	0	0	0	443	0	0	0	0	0	0	38	0	28	0	0	66	629
Total	0	302	75	0	0	377	381	931	0	0	0	1312	0	0	0	0	0	0	104	0	106	1	1	211	1900
8:00 AM	0	85	9	0	0	94	113	411	0	0	0	524	0	0	0	0	2	0	38	0	25	0	1	63	681
8:15 AM	0	116	23	0	0	139	105	369	0	0	0	474	0	0	0	0	1	0	50	0	33	0	0	83	696
8:30 AM	0	84	23	0	0	107	83	246	0	0	0	329	0	0	0	0	1	0	40	0	37	0	1	77	513
8:45 AM	0	97	25	0	0	122	91	282	0	0	0	373	0	0	0	0	0	0	36	0	28	0	1	64	559
Total	0	382	80	0	0	462	392	1308	0	0	0	1700	0	0	0	0	4	0	164	0	123	0	3	287	2449
BREAK																									
3:00 PM	0	137	17	0	0	154	58	126	0	0	0	184	0	0	0	0	0	0	37	0	53	0	0	90	428
3:15 PM	0	201	16	0	0	217	39	131	0	0	0	170	0	0	0	0	2	0	22	0	56	0	0	78	465
3:30 PM	0	147	17	0	0	164	42	107	0	0	30	149	0	1	1	0	31	2	30	0	58	1	1	89	404
3:45 PM	0	159	34	0	0	193	44	133	0	0	1	177	0	0	0	0	1	0	33	0	53	0	1	86	456
Total	0	644	84	0	0	728	183	497	0	0	31	680	0	1	1	0	34	2	122	0	220	1	2	343	1753
4:00 PM	0	206	22	0	0	228	26	91	0	0	0	117	0	0	0	0	4	0	23	0	72	0	0	95	440
4:15 PM	1	168	15	0	0	184	32	116	0	0	0	148	0	0	0	0	2	0	25	0	52	1	0	78	410
4:30 PM	0	227	24	0	0	251	42	88	0	0	0	130	0	0	0	0	1	0	29	0	76	0	0	105	486
4:45 PM	0	221	19	0	0	240	29	96	0	0	0	125	0	0	0	0	0	0	30	0	64	1	0	95	460
Total	1	822	80	0	0	903	129	391	0	0	0	520	0	0	0	0	7	0	107	0	264	2	0	373	1796
5:00 PM	0	362	41	0	0	403	19	117	0	0	0	136	0	0	0	0	0	0	32	0	95	0	2	127	666
5:15 PM	0	281	33	0	0	314	28	142	0	0	0	170	0	0	0	0	0	0	41	0	77	0	0	118	602
5:30 PM	0	262	20	0	0	282	22	140	0	0	0	162	0	0	0	0	0	0	40	0	67	0	0	107	551
5:45 PM	0	214	28	0	0	242	31	112	0	0	0	143	0	0	1	0	0	1	18	0	51	0	0	69	455
Total	0	1119	122	0	0	1241	100	511	0	0	0	611	0	0	1	0	0	1	131	0	290	0	2	421	2274
Grand Total	1	3369	459	0	1	3829	1423	3860	0	0	31	5283	0	1	2	0	46	3	661	0	1044	4	8	1709	10824
Apprch %	0.0	88.0	12.0	0.0	0.0		26.9	73.1	0.0	0.0	0.6		0.0	33.3	66.7	0.0	1533.3		38.7	0.0	61.1	0.2	0.5		
Total %	0.0	31.1	4.2	0.0	0.0	35.4	13.1	35.7	0.0	0.0	0.3	48.8	0.0	0.0	0.0	0.0	0.4	0.0	6.1	0.0	9.6	0.0	0.1	15.8	
Cars, PU, Vans	1	3310	456	0		3767	1378	3804	0	0		5182	0	1	2	0		3	658	0	985	4		1647	10599
% Cars, PU, Vans	100.0	98.2	99.3	0.0		98.4	96.8	98.5	0.0	0.0		98.1	0.0	100.0	100.0	0.0		100.0	99.5	0.0	94.3	100.0		96.4	97.9
Heavy Trucks	0	59	3	0		62	45	56	0	0		101	0	0	0	0		0	3	0	59	0		62	225
%Heavy Trucks	0.0	1.8	0.7	0.0		1.6	3.2	1.5	0.0	0.0		1.9	0.0	0.0	0.0	0.0		0.0	0.5	0.0	5.7	0.0		3.6	2.1

Project ID: 20-09035-001

Location: SR 85/2nd Ave & Talbotton Rd

City: Columbus

Day: Tuesday

Date: 02/04/2020

PEAK HOURS

AM

	SR 85/2nd Ave Northbound					SR 85/2nd Ave Southbound					Talbotton Rd Eastbound					Talbotton Rd Westbound						
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total	
Peak Hour Analysis from 06:00 AM to 09:00 AM																						
Peak Hour for Entire Intersection Begins at 07:30 AM																						
7:30 AM	0	97	17	0	114	114	267	0	0	381	0	0	0	0	0	33	0	27	0	60	555	
7:45 AM	0	97	23	0	120	123	320	0	0	443	0	0	0	0	0	38	0	28	0	66	629	
8:00 AM	0	85	9	0	94	113	411	0	0	524	0	0	0	0	0	38	0	25	0	63	681	
8:15 AM	0	116	23	0	139	105	369	0	0	474	0	0	0	0	0	50	0	33	0	83	696	
Total Volume	0	395	72	0	467	455	1367	0	0	1822	0	0	0	0	0	159	0	113	0	272	2561	
% App. Total	0.0	84.6	15.4	0.0	100	25.0	75.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0	58.5	0.0	41.5	0.0	100		
PHF	0.840					0.869										0.819					0.920	
Cars, PU, Vans	0	378	71	0	449	446	1355	0	0	1801	0	0	0	0	0	157	0	101	0	258	2508	
% Cars, PU, Vans	0.0	95.7	98.6	0.0	96.1	98.0	99.1	0.0	0.0	98.8	0.0	0.0	0.0	0.0	0.0	98.7	0.0	89.4	0.0	94.9	97.9	
Heavy Trucks	0	17	1	0	18	9	12	0	0	21	0	0	0	0	0	2	0	12	0	14	53	
%Heavy Trucks	0.0	4.3	1.4	0.0	3.9	2.0	0.9	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.3	0.0	10.6	0.0	5.1	2.1	

PM

	SR 85/2nd Ave Northbound					SR 85/2nd Ave Southbound					Talbotton Rd Eastbound					Talbotton Rd Westbound						
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total	
Peak Hour Analysis from 03:00 PM to 06:00 PM																						
Peak Hour for Entire Intersection Begins at 04:45 PM																						
4:45 PM	0	221	19	0	240	29	96	0	0	125	0	0	0	0	0	30	0	64	1	95	460	
5:00 PM	0	362	41	0	403	19	117	0	0	136	0	0	0	0	0	32	0	95	0	127	666	
5:15 PM	0	281	33	0	314	28	142	0	0	170	0	0	0	0	0	41	0	77	0	118	602	
5:30 PM	0	262	20	0	282	22	140	0	0	162	0	0	0	0	0	40	0	67	0	107	551	
Total Volume	0	1126	113	0	1239	98	495	0	0	593	0	0	0	0	0	143	0	303	1	447	2279	
% App. Total	0.0	90.9	9.1	0.0	100	16.5	83.5	0.0	0.0	100	0.0	0.0	0.0	0.0	0	32.0	0.0	67.8	0.2	100		
PHF	0.769					0.872										0.880					0.855	
Cars, PU, Vans	0	1119	112	0	1231	95	489	0	0	584	0	0	0	0	0	143	0	299	1	443	2258	
% Cars, PU, Vans	0.0	99.4	99.1	0.0	99.4	96.9	98.8	0.0	0.0	98.5	0.0	0.0	0.0	0.0	0.0	100.0	0.0	98.7	100.0	99.1	99.1	
Heavy Trucks	0	7	1	0	8	3	6	0	0	9	0	0	0	0	0	0	0	4	0	4	21	
%Heavy Trucks	0.0	0.6	0.9	0.0	0.6	3.1	1.2	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.9	0.9	

6.3 TRAFFIC COUNTS AND GROWTH RATE

Project ID: 20-09035-003

Location: SR 85/2nd Ave & 29th St

City: Columbus

Day: Tuesday

Date: 02/04/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks																									
SR 85/2nd Ave Northbound						SR 85/2nd Ave Southbound						29th St Eastbound						29th St Westbound						Int. Total	
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
6:00 AM	0	15	2	0	0	17	0	56	0	0	0	56	0	0	0	0	2	0	0	0	0	0	0	0	73
6:15 AM	0	19	0	0	0	19	1	107	0	0	0	108	0	0	1	0	3	1	0	0	1	0	0	1	129
6:30 AM	1	44	1	0	2	46	0	124	0	0	0	124	0	0	0	0	8	0	1	0	0	0	0	1	171
6:45 AM	0	50	0	0	0	50	1	165	0	0	0	166	0	0	2	0	4	2	0	1	0	0	1	1	219
Total	1	128	3	0	2	132	2	452	0	0	0	454	0	0	3	0	17	3	1	1	1	0	1	3	592
7:00 AM	0	60	2	0	0	62	0	218	0	0	0	218	1	0	0	0	0	1	2	1	1	0	0	4	285
7:15 AM	2	76	2	0	1	80	3	277	0	0	0	280	0	0	1	0	1	1	0	0	1	0	0	1	362
7:30 AM	0	99	1	0	0	100	1	400	0	0	0	401	0	1	2	0	0	3	1	0	0	0	0	1	505
7:45 AM	0	104	5	0	0	109	1	447	1	0	0	449	0	0	0	0	0	0	0	1	2	0	0	3	561
Total	2	339	10	0	1	351	5	1342	1	0	0	1348	1	1	3	0	1	5	3	2	4	0	0	9	1713
8:00 AM	0	94	2	1	1	97	1	552	0	0	0	553	1	0	1	0	1	2	2	0	2	0	0	4	656
8:15 AM	1	137	1	0	0	139	1	454	0	0	0	455	0	0	0	0	0	0	1	2	2	0	0	5	599
8:30 AM	0	115	0	0	2	115	1	353	1	0	0	355	2	0	2	0	3	4	1	0	5	0	2	6	480
8:45 AM	1	107	3	0	0	111	1	357	1	0	0	359	1	0	1	0	1	2	0	0	6	0	2	6	478
Total	2	453	6	1	3	462	4	1716	2	0	0	1722	4	0	4	0	5	8	4	2	15	0	4	21	2213
BREAK																									
3:00 PM	2	180	3	0	1	185	1	180	0	0	0	181	1	0	1	0	4	2	3	3	2	0	0	8	376
3:15 PM	0	239	1	0	0	240	1	161	1	0	0	163	1	1	1	0	6	3	1	3	2	0	0	6	412
3:30 PM	1	188	4	0	2	193	3	143	0	0	0	146	0	1	1	0	6	2	2	4	4	0	0	10	351
3:45 PM	4	214	3	0	1	221	1	159	1	0	1	161	3	0	1	0	3	4	1	1	2	0	1	4	390
Total	7	821	11	0	4	839	6	643	2	0	1	651	5	2	4	0	19	11	7	11	10	0	1	28	1529
4:00 PM	0	268	3	0	0	271	1	114	0	0	0	115	0	0	0	0	2	0	3	1	1	0	0	5	391
4:15 PM	0	222	2	0	1	224	2	134	1	0	0	137	0	1	1	0	6	2	2	1	4	0	0	7	370
4:30 PM	1	266	3	0	0	270	0	126	1	0	0	127	3	1	0	0	2	4	1	3	6	0	0	10	411
4:45 PM	0	288	5	0	0	293	0	109	0	0	0	109	1	0	1	0	0	2	4	2	6	0	0	12	416
Total	1	1044	13	0	1	1058	3	483	2	0	0	488	4	2	2	0	10	8	10	7	17	0	0	34	1588
5:00 PM	1	432	2	0	0	435	4	136	0	0	0	140	2	0	0	0	2	2	1	1	5	0	0	7	584
5:15 PM	0	387	7	0	0	394	5	141	1	0	0	147	2	1	2	0	0	5	4	5	5	0	0	14	560
5:30 PM	1	313	2	0	0	316	4	151	2	0	0	157	0	0	0	0	1	0	3	0	2	0	0	5	478
5:45 PM	1	261	3	0	0	265	0	140	2	0	0	142	0	0	2	0	1	2	1	1	1	0	0	3	412
Total	3	1393	14	0	0	1410	13	568	5	0	1	586	4	1	4	0	4	9	9	7	13	0	0	29	2034
Grand Total	16	4178	57	1	11	4252	33	5204	12	0	2	5249	18	6	20	0	56	44	34	30	60	0	6	124	9669
Apprch %	0.4	98.3	1.3	0.0	0.3		0.6	99.1	0.2	0.0	0.0		40.9	13.6	45.5	0.0	127.3		27.4	24.2	48.4	0.0	4.8		
Total %	0.2	43.2	0.6	0.0	0.1	44.0	0.3	53.8	0.1	0.0	0.0	54.3	0.2	0.1	0.2	0.0	0.6	0.5	0.4	0.3	0.6	0.0	0.1	1.3	
Cars, PU, Vans	16	4080	56	1		4153	32	5093	12	0		5137	17	6	20	0		43	31	30	60	0		121	9454
% Cars, PU, Vans	100.0	97.7	98.2	100.0		97.7	97.0	97.9	100.0	0.0		97.9	94.4	100.0	100.0	0.0		97.7	91.2	100.0	100.0	0.0		97.6	97.8
Heavy Trucks	0	98	1	0		99	1	111	0	0		112	1	0	0	0		1	3	0	0	0		3	215
%Heavy Trucks	0.0	2.3	1.8	0.0		2.3	3.0	2.1	0.0	0.0		2.1	5.6	0.0	0.0	0.0		2.3	8.8	0.0	0.0	0.0		2.4	2.2

Project ID: 20-09035-003

Location: SR 85/2nd Ave & 29th St

City: Columbus

PEAK HOURS

Day: Tuesday

Date: 02/04/2020

AM

SR 85/2nd Ave Northbound						SR 85/2nd Ave Southbound						29th St Eastbound						29th St Westbound								
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 06:00 AM to 09:00 AM																										
Peak Hour for Entire Intersection Begins at 07:30 AM																										
7:30 AM	0	99	1	0	100	1	400	0	0	401	0	1	2	0	3	1	0	0	0	1						505
7:45 AM	0	104	5	0	109	1	447	1	0	449	0	0	0	0	0	0	1	2	0	3						561
8:00 AM	0	94	2	1	97	1	552	0	0	553	1	0	1	0	2	2	0	2	0	4						656
8:15 AM	1	137	1	0	139	1	454	0	0	455	0	0	0	0	0	1	2	2	0	5						599
Total Volume	1	434	9	1	445	4	1853	1	0	1858	1	1	3	0	5	4	3	6	0	13						2321
% App. Total	0.2	97.5	2.0	0.2	100	0.2	99.7	0.1	0.0	100	20.0	20.0	60.0	0.0	100	30.8	23.1	46.2	0.0	100						
PHF	0.800					0.840					0.417					0.650					0.885					
Cars, PU, Vans	1	414	8	1	424	4	1828	1	0	1833	1	1	3	0	5	3	3	6	0	12						2274
% Cars, PU, Vans	100.0	95.4	88.9	100.0	95.3	100.0	98.7	100.0	0.0	98.7	100.0	100.0	100.0	0.0	100.0	75.0	100.0	100.0	0.0	92.3						98.0
Heavy Trucks	0	20	1	0	21	0	25	0	0	25	0	0	0	0	0	1	0	0	0	1						47
%Heavy Trucks	0.0	4.6	11.1	0.0	4.7	0.0	1.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	7.7						2.0

PM

SR 85/2nd Ave Northbound						SR 85/2nd Ave Southbound						29th St Eastbound						29th St Westbound								
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 03:00 PM to 06:00 PM																										
Peak Hour for Entire Intersection Begins at 04:45 PM																										
4:45 PM	0	288	5	0	293	0	109	0	0	109	1	0	1	0	2	4	2	6	0	12						416
5:00 PM	1	432	2	0	435	4	136	0	0	140	2	0	0	0	2	1	1	5	0	7						584
5:15 PM	0	387	7	0	394	5	141	1	0	147	2	1	2	0	5	4	5	5	0	14						560
5:30 PM	1	313	2	0	316	4	151	2	0	157	0	0	0	0	0	3	0	2	0	5						478
Total Volume	2	1420	16	0	1438	13	537	3	0	553	5	1	3	0	9	12	8	18	0	38						2038
% App. Total	0.1	98.7	1.1	0.0	100	2.4	97.1	0.5	0.0	100	55.6	11.1	33.3	0.0	100	31.6	21.1	47.4	0.0	100						
PHF	0.826					0.881					0.450					0.679					0.872					
Cars, PU, Vans	2	1413	16	0	1431	13	526	3	0	542	5	1	3	0	9	12	8	18	0	38						2020
% Cars, PU, Vans	100.0	99.5	100.0	0.0	99.5	100.0	98.0	100.0	0.0	98.0	100.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	0.0	100.0						99.1
Heavy Trucks	0	7	0	0	7	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0						18
%Heavy Trucks	0.0	0.5	0.0	0.0	0.5	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						0.9

6.3 TRAFFIC COUNTS AND GROWTH RATE

Project ID: 20-09035-005
Location: SR 85/2nd Ave & 38th St
City: Columbus

Day: Tuesday
Date: 02/04/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks																								
SR 85/2nd Ave Northbound					SR 85/2nd Ave Southbound					38th St Eastbound					38th St Westbound					Int. Total				
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total
6:00 AM	0	21	1	0	0	22	1	54	3	0	0	58	0	0	0	0	0	0	0	0	0	2	0	2
6:15 AM	0	18	1	0	0	19	0	112	2	0	0	114	2	0	1	0	0	2	2	0	1	0	0	3
6:30 AM	0	38	3	0	0	41	3	136	0	0	0	139	2	0	1	0	0	3	0	3	1	0	1	4
6:45 AM	1	54	0	0	0	55	8	176	6	0	0	190	8	1	2	0	0	11	2	2	0	0	0	4
Total	1	131	5	0	0	137	12	478	11	0	0	501	12	1	3	0	0	16	4	5	4	0	1	13
7:00 AM	0	59	1	0	0	60	6	208	1	0	0	215	3	1	0	0	0	4	4	2	5	0	0	11
7:15 AM	0	75	1	0	0	76	8	295	11	0	0	314	11	3	1	0	0	15	4	2	2	0	3	8
7:30 AM	1	103	6	0	0	110	5	396	12	0	0	413	10	4	2	0	0	16	6	2	5	0	2	13
7:45 AM	0	109	7	0	0	116	8	471	20	0	0	499	14	2	0	0	0	16	8	4	10	0	1	22
Total	1	346	15	0	0	362	27	1370	44	0	0	1441	38	10	3	0	0	51	22	10	22	0	6	54
8:00 AM	1	86	6	0	0	93	13	542	31	0	0	586	15	1	1	0	0	17	6	2	5	0	1	13
8:15 AM	1	147	2	0	0	150	8	442	21	0	2	471	12	0	0	0	0	12	5	3	6	0	1	14
8:30 AM	0	117	5	0	1	122	4	346	16	0	0	366	9	0	4	0	1	13	8	0	4	0	0	12
8:45 AM	4	100	8	0	0	112	8	359	20	0	0	387	10	2	5	0	1	17	8	2	5	0	1	15
Total	6	450	21	0	1	477	33	1689	88	0	2	1810	46	3	10	0	2	59	27	7	20	0	3	54
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	1	187	8	0	1	196	4	177	7	0	0	188	12	5	2	0	0	19	6	0	5	0	0	11
3:15 PM	2	237	11	0	0	250	1	149	8	0	0	158	7	0	4	0	0	11	3	7	4	0	0	14
3:30 PM	3	187	6	0	0	196	6	134	10	0	0	150	11	2	4	0	0	17	10	1	5	0	0	16
3:45 PM	5	218	3	0	0	226	1	164	11	0	2	176	7	0	3	0	0	10	4	1	6	0	0	11
Total	11	829	28	0	1	868	12	624	36	0	2	672	37	7	13	0	0	57	23	9	20	0	0	52
4:00 PM	2	271	2	0	0	275	5	110	9	0	0	124	20	3	0	0	0	23	5	3	12	0	0	20
4:15 PM	0	213	5	0	0	218	7	136	8	0	0	151	15	1	2	0	0	18	6	4	7	0	0	17
4:30 PM	2	254	6	0	1	262	5	137	10	0	1	152	27	3	0	0	1	30	5	1	3	0	2	9
4:45 PM	0	281	7	0	0	288	8	97	10	0	0	115	30	2	1	0	0	33	7	4	7	0	2	18
Total	4	1019	20	0	1	1043	25	480	37	0	1	542	92	9	3	0	1	104	23	12	29	0	4	64
5:00 PM	1	452	8	0	0	461	6	120	6	0	0	132	34	6	0	0	0	40	9	1	7	0	1	17
5:15 PM	3	382	11	0	0	396	6	142	5	0	0	153	30	7	0	0	0	37	11	4	10	0	2	25
5:30 PM	2	348	5	0	0	355	9	147	8	0	0	164	24	4	0	0	0	28	10	5	3	1	0	19
5:45 PM	6	266	2	0	0	274	8	133	11	0	1	152	14	3	1	0	1	18	10	2	6	0	1	18
Total	12	1448	26	0	0	1486	29	542	30	0	1	601	102	20	1	0	1	123	40	12	26	1	4	79
Grand Total	35	4223	115	0	3	4373	138	5183	246	0	6	5567	327	50	33	0	4	410	139	55	121	1	18	316
Approch %	0.8	96.6	2.6	0.0	0.1		2.5	93.1	4.4	0.0	0.1		79.8	12.2	8.0	0.0	1.0		44.0	17.4	38.3	0.3	5.7	
Total %	0.3	39.6	1.1	0.0	0.0	41.0	1.3	48.6	2.3	0.0	0.1	52.2	3.1	0.5	0.3	0.0	0.0	3.8	1.3	0.5	1.1	0.0	0.2	3.0
Cars, PU, Vans	33	4128	112	0	0	4273	125	5076	233	0	0	5434	320	45	32	0	0	397	135	51	108	1	1	295
% Cars, PU, Vans	94.3	97.8	97.4	0.0	0.0	97.7	90.6	97.9	94.7	0.0	0.0	96.8	97.1	90.0	97.0	0.0	0.0	96.8	97.1	92.7	89.3	100.0	0.0	93.4
Heavy Trucks	2	95	3	0	0	100	13	107	13	0	0	133	7	5	1	0	0	13	4	4	13	0	0	21
%Heavy Trucks	5.7	2.2	2.6	0.0	0.0	2.3	9.4	2.1	5.3	0.0	0.0	2.4	2.1	10.0	3.0	0.0	0.0	3.2	2.9	7.3	10.7	0.0	0.0	6.6

PEAK HOUR

715-815

PEAK HOUR FACTOR

0.78

Project ID: 20-09035-005
Location: SR 85/2nd Ave & 38th St
City: Columbus

Day: Tuesday
Date: 02/04/2020

PEAK HOURS

AM

Start Time	SR 85/2nd Ave Northbound					SR 85/2nd Ave Southbound					38th St Eastbound					38th St Westbound					Int. Total
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	
Peak Hour Analysis from 06:00 AM to 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
7:30 AM	1	103	6	0	110	5	396	12	0	413	10	4	2	0	16	6	2	5	0	13	552
7:45 AM	0	109	7	0	116	8	471	20	0	499	14	2	0	0	16	8	4	10	0	22	653
8:00 AM	1	86	6	0	93	13	542	31	0	586	15	1	1	0	17	6	2	5	0	13	709
8:15 AM	1	147	2	0	150	8	442	21	0	471	12	0	0	0	12	5	3	6	0	14	647
Total Volume	3	445	21	0	469	34	1851	84	0	1969	51	7	3	0	61	25	11	26	0	62	2561
% App. Total	0.6	94.9	4.5	0.0	100	1.7	94.0	4.3	0.0	100	83.6	11.5	4.9	0.0	100	40.3	17.7	41.9	0.0	100	
PHF	0.782					0.840					0.897					0.705					0.903
Cars, PU, Vans	3	423	20	0	446	31	1830	76	0	1937	47	7	3	0	57	25	9	23	0	57	2497
% Cars, PU, Vans	100.0	95.1	95.2	0.0	95.1	91.2	98.9	90.5	0.0	98.4	92.2	100.0	100.0	0.0	93.4	100.0	81.8	88.5	0.0	91.9	97.5
Heavy Trucks	0	22	1	0	23	3	21	8	0	32	4	0	0	0	4	0	2	3	0	5	64
%Heavy Trucks	0.0	4.9	4.8	0.0	4.9	8.8	1.1	9.5	0.0	1.6	7.8	0.0	0.0	0.0	6.6	0.0	18.2	11.5	0.0	8.1	2.5

PM

Start Time	SR 85/2nd Ave Northbound					SR 85/2nd Ave Southbound					38th St Eastbound					38th St Westbound					Int. Total
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	
Peak Hour Analysis from 03:00 PM to 06:00 PM																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
5:00 PM	1	452	8	0	461	6	120	6	0	132	34	6	0	0	40	9	1	7	0	17	650
5:15 PM	3	382	11	0	396	6	142	5	0	153	30	7	0	0	37	11	4	10	0	25	611
5:30 PM	2	348	5	0	355	9	147	8	0	164	24	4	0	0	28	10	5	3	1	19	566
5:45 PM	6	266	2	0	274	8	133	11	0	152	14	3	1	0	18	10	2	6	0	18	462
Total Volume	12	1448	26	0	1486	29	542	30	0	601	102	20	1	0	123	40	12	26	1	79	2289
% App. Total	0.8	97.4	1.7	0.0	100	4.8	90.2	5.0	0.0	100	82.9	16.3	0.8	0.0	100	50.6	15.2	32.9	1.3	100	
PHF	0.806					0.916					0.769					0.790					0.880
Cars, PU, Vans	12	1445	26	0	1483	27	534	30	0	591	102	17	1	0	120	39	12	25	1	77	2271
% Cars, PU, Vans	100.0	99.8	100.0	0.0	99.8	93.1	99.5	100.0	0.0	98.3	100.0	85.0	100.0	0.0	97.6	97.5	100.0	96.2	100.0	97.5	99.2
Heavy Trucks	0	3	0	0	3	2	8	0	0	10	0	3	0	0	3	1	0	1	0	2	18
%Heavy Trucks	0.0	0.2	0.0	0.0	0.2	6.9	1.5	0.0	0.0	1.7	0.0	15.0	0.0	0.0	2.4	2.5	0.0	3.8	0.0	2.5	0.8

6.4 RIGHT-SIZING POLICY EXAMPLES

Introduction

This memorandum explores existing guidance and policies on right-sizing roadways – also known as lane reconfigurations, road diets, and lane elimination projects - and presents five case studies of lane reconfigurations which resulted in a single travel lane with either a two-way-left-turn-lane (TWLTL) or left turn lanes where needed and raised medians. There are numerous case studies around the United States which have shown that such conversions can still function acceptably at volumes similar to those observed on 2nd Avenue in Columbus. Right-sizing roadways can have many favorable outcomes, including lower multi-modal crash rates, opportunities to provide landscaped medians with pedestrian refuges, and repurposing extra asphalt as on-street bicycle facilities.

Guidance

Neither the MUTCD nor American Association of State Highway and Transportation Officials (AASHTO) Green Book cover this subject explicitly, as the general parameters are found throughout any source document on roadway design. There are, however, many other guidance documents throughout the United States which offer guidance on the practice. FHWA has an extensive list on its road diet resources website¹. The sources summarized below are national level documents which address the subject directly.

FHWA's *2014 Road Diets, an Informational Guide*² leans on several previous studies, including a 2011 Kentucky study³ and documented case studies documented by Knapp, Giese, and Lee⁴ with upper limits of 23,000 and 24,000 ADT respectively. FHWA goes on to recommend that roadways with an ADT of 20,000 or less may be good candidates for a road diet and says, "If the ADT is near the upper limits of the study volumes, practitioners should conduct further analysis to determine its operational feasibility. This would include looking at peak hour volumes by direction and considering other factors such as signal spacing, turning volumes at intersections, and other access points. Each practitioner should use engineering judgment to decide how much analysis is necessary and take examples from this report as a guide."

AASHTO Guide for the Development of Bicycle Facilities, 4th Edition⁵ provides information on how to accommodate bicycle travel and operations in most riding environments. Road diets are one of the solutions that the guide recommends to expand a bicycle network and it contains several pages about this countermeasure.

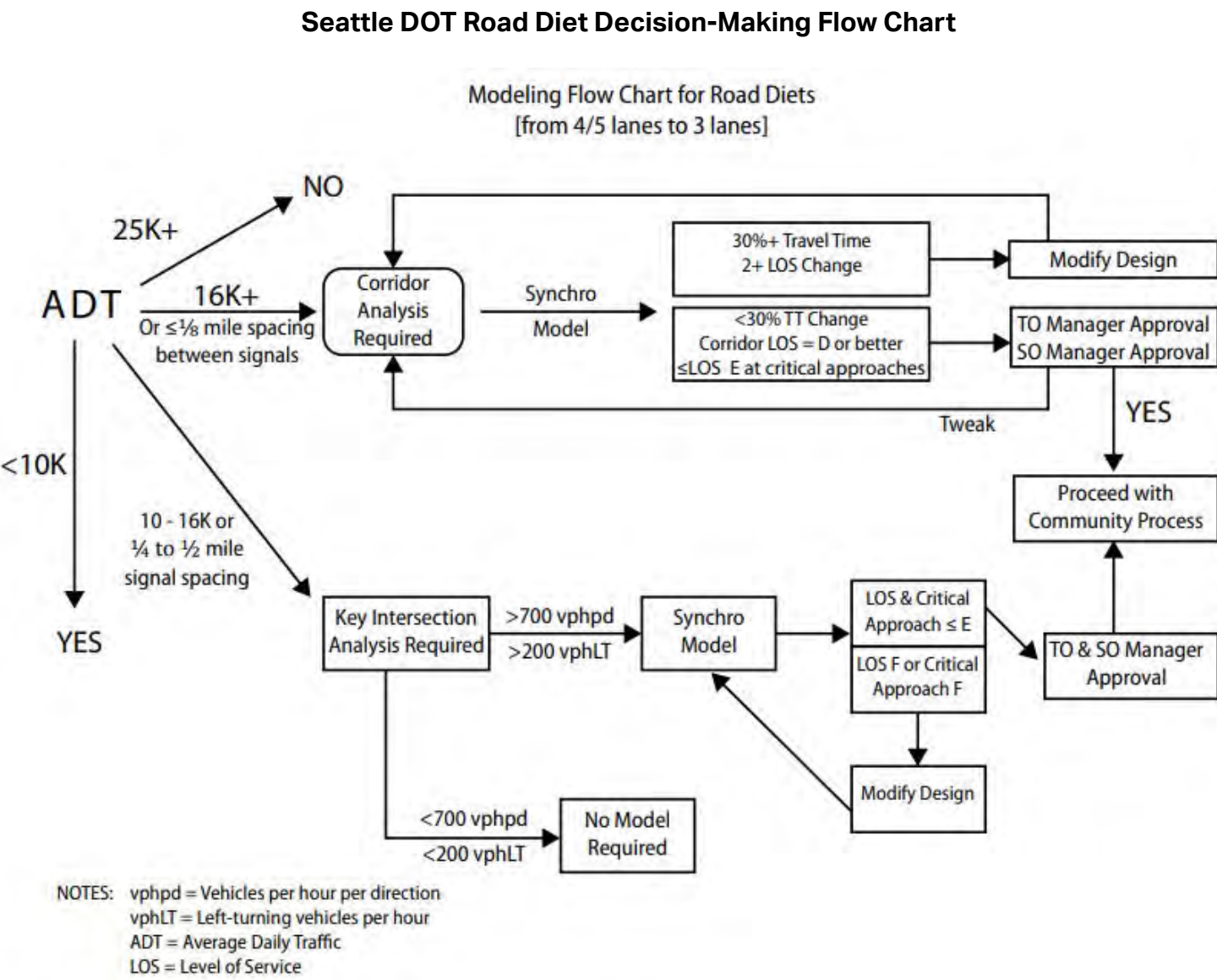
Relevant Policies

Various local and state agencies have adopted their own policies intended to guide feasibility assessments for lane reductions to a three-lane configuration. As the case study section of this memo illustrates, there can be successful three-lane conversions at volumes above 20,000 ADT. Many agencies have lower maximum ADT thresholds; however, some agencies have chosen to allow study at higher ADTs with the outcome dependent on the feasibility demonstrated in the traffic analysis. This section summarizes a selection of agencies that have higher ADT policy limits. A more robust discussion on this topic can be found within the FHWA Guide.

Seattle, WA

Seattle, WA allows maximum ADT volume thresholds of up to 25,000 for three-lane configurations.⁶ To guide road diet implementations, Seattle DOT developed the flow chart shown in the figure on page 215 to support its road diet decision-making process. First, the city calculates the ADT of the roadway segment in question, combined with signal spacing. In some cases, this will lead to additional operational analyses of the entire corridor or key intersections. Depending on the results of this additional analysis, further modeling may be required (e.g., via Highway Capacity Software or Synchro).

Those results may require modifications to the design to accommodate traffic. Once the simulation results are satisfactory, the Traffic Operations Manager and Signal Operations Manager must formally approve the road diet project to move forward.



¹ https://safety.fhwa.dot.gov/road_diets/resources/fhwasa16072/
² https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/rdig.pdf
³ https://nacto.org/docs/usdg/guidelines_for_road_diet_conversion_stamatiadis.pdf
⁴ Knapp, K., K. Giese, *Guidelines for the Conversion of Urban Four-Lane Undivided Roadways to Three-Lane Two-Way Left-Turn Lane Facilities*, 2001.
⁵ <https://store.transportation.org/?AspxAutoDetectCookieSupport=1>
⁶ https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/rdig.pdf

6.4 RIGHT-SIZING POLICY EXAMPLES

Florida DOT

FDOT has published a very comprehensive Lane Elimination Guide⁷ in which a process is outlined to evaluate the feasibility for a variety of scenarios. For a resultant three-lane conversion the process is abbreviated if the ADT is below 15,000. The Guide states that four-lane roads with ADTs higher than 20,000 should be evaluated for lane elimination feasibility on a case-by-case basis.

Maine DOT

The Maine DOT also has road diet guidelines⁸, which cautions that if volumes exceed 20,000 to 25,000.

Michigan DOT

Michigan DOT⁹ has chosen to view all existing four-lane, undivided roads as potential implementation sites. Many local Michigan agencies believe that a three-lane cross-section is the desirable roadway cross section compared to two-lane and four-lane undivided cross sections, and they actively work to identify which four-lane undivided roads are good candidates for road diets. Michigan DOT gives the following outline for guidance related to reducing lanes when considering implementation of a road diet:

- **Planning and Policy** – Includes information on the purpose and need for the road diet, planning considerations for the local community and regional planning agency, Transportation Improvement Program (TIP) processes, etc.
- **Feasibility Determination Factors** – Includes information regarding traffic volumes, traffic modeling, turning movements, level of service, crash analysis, etc.
- **Operational Criteria** – Includes information regarding acceptable Level of Service (LOS) and improvements related to certain crash types.
- **Geometric Design Criteria** – Describes maintaining proper geometrics using major road standards.
- **Systems Considerations** – Includes considerations regarding parking, pedestrian and bicycle issues, school routes, etc.
- **Project Costs** – Describes financial arrangements for cost-share projects.
- **Public Involvement** – Describes the communication process prior to implementation.

⁷ https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/content/planning/systems/programs/sm/laneelimination/lane-elimination-guide-phase2.pdf?sfvrsn=6b295a1f_0

⁸ https://safety.fhwa.dot.gov/road_diets/guidance/docs/maineDOTroad_diet.pdf

⁹ https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/rdig.pdf

6.5 CASE STUDIES

Most of the case studies presented in this section have been installed for at least 15 to 20 years. In the late 1990s and early 2000s there were many detailed studies which summarized the impacts of the lane reconfigurations. Lane reconfigurations are less controversial in recent years, mostly due to the more rigorous study devoted to the subject when it was still an emerging practice. This section involves a literature review of road diet case studies with those above 20,000 ADT. Where the data was easily retrievable, the most current traffic counts are provided for comparison purposes.

Valencia Street – 1999, 2006, 2019, 2020 (San Francisco, CA)

Before the project, Valencia Street was a four-lane arterial street with an ADT of approximately 22,000 vehicles per day. A bus transit line with a headway of 15 to 20 minutes travels along the street.¹⁰ There is a heavy pedestrian presence because the street is a popular area with restaurants, nightclubs, and a variety of shops. All intersections have signals. To minimize the loss of capacity along Valencia Street and reduce the impacts to parallel streets, changes were made to the signal timing along Valencia Street and Guerrero Street one block to the west. On Valencia Street, the green time was maximized for the Valencia Street split while still maintaining time for pedestrians crossing Valencia Street. On Guerrero Street, the signal offsets were modified to promote a smoother progression at 25 mph, as the speed limit was lowered from 30 mph to address citizen concerns along the primarily residential street. The speed limit change and signal timing modifications were intended to address speeding concerns and help mitigate the likely increase of traffic along Guerrero Street.

Findings

- After determining the green times for Valencia Street, it was predicted that 10 percent of Valencia Street traffic would divert to parallel streets after the road diet was performed. As expected, Valencia Street traffic volumes dropped by 10 percent.
- Total collisions declined by 20 percent.
- Although bicycle collisions increased by approximately 50 percent, the increase was outpaced by the 140 percent rise in ridership along the street. Collisions involving pedestrians dropped by 36 percent.

Legacy

The street has been continually improved following the initial implementation in certain sections with lower volumes with the addition of separated bike lanes, transit boarding islands and removal of the center turn lanes in places¹¹.



Before Road Diet



After Road Diet

¹⁰ http://www.pedbikesafe.org/BIKESAFE/case_studies/casestudy.cfm?CS_NUM=103

6.5 CASE STUDIES

East Blvd, 2005-2011 (Charlotte, NC)

The City of Charlotte undertook a complex, three-phase road diet over a 1.5 mile segment of East Boulevard to moderate travel speeds, increase pedestrian comfort and safety, and help to bring about the community’s vision for the corridor. Some of the project was a 4 to 3 conversion and some of it was a 5 to 3. Volumes varied along the corridor, but peaked at 25,000 in one location.

Findings

- Between 2004 and 2011, AADT dropped from 20,500 to around 17,500 in the Phase 1 area and increased from 18,600 to 19,700 in the Phase 2 area¹². 2019 counts show 17,700 AADT¹³ in the Phase 1 area.
- Safety has improved with crashes decreasing in both sections, from 2.64 to 1.67 crashes per month in Phase 1 and 1.97 to 1.86 crashes per month in Phase 2.
- Speeds in the Phase 1¹⁴ section dropping three to four miles per hour, and a bigger drop in speed in Phase 2.
- Improvements in safety have gone hand-in-hand with a 47% increase in non-residential property values in the Phase 2 section, which raised annual tax revenues by \$530,000.

Phase I



Before Road Diet



After Road Diet

Phase II



Before Road Diet



After Road Diet

Lake Washington Blvd 1995 (Kirkland, WA)

This largely residential street travels by high priced homes with spectacular views of Lake Washington. When Lake Washington Boulevard was operated with four lanes, capacity problems were evident most evenings. Residents trying to enter or exit driveways on both sides of the road tended to constrain the flow on the 23,000 AADT roadway.

Findings

- Motorists now had substantial added border width to fixed objects¹⁵.
- Residents saw reduction in speeding and noise levels, and they could now enter and exit their driveways much more easily.
- Volumes generally went up after conversion with the after ADT south of Hwy 83 recording 25,913 vehicles per day. At one point a traffic counter captured nearly 30,000 vehicles per day¹⁶.



After Road Diet

¹¹ <https://www.sfmta.com/projects/valencia-bikeway-improvements>

¹² <https://www.pps.org/article/east-boulevard-was-remade-to-achieve-community-desires>

¹³ <https://charlottenc.gov/Transportation/PlansProjects/Documents/2019%20Traffic%20Counts.pdf>

¹⁴ <https://www.completestreetsnc.org/project-examples/ex-eastblvdroaddiet/>

¹⁵ https://nacto.org/wp-content/uploads/2015/04/road_diets_fixing_big_roads_burden.pdf

¹⁶ http://www.pedbikeinfo.org/cms/downloads/WhitePaper_RoadDiets_PBIC.pdf

6.5 CASE STUDIES

Grand River Ave, 1997 (East Lansing, MI)

As part of a series of experiments with road diets, the Michigan DOT decided to test the concept on a higher volume roadway. Grand River Blvd was selected with an ADT of 23,000. They implemented on a trial basis with no bike lanes which resulted in 16 foot outside lanes. Second stage markings were made six months later. Bike lanes were added, narrowing travel lanes to 12 feet. Local business owners, residents and the MDOT staff were pleased with the results and the configuration persists to this day.

Findings

- Initial speeds came down from 40 mph to 35 mph initially, and further still with the addition of bike lanes.
- Counts have declined with local population loss. 2017 counts show a maximum of just over 17,000 ADT.



After Road Diet

La Jolla Blvd, 2008 (La Jolla, CA)

Located in the coastal Bird Rock neighborhood in San Diego¹⁷, La Jolla Boulevard is part of Highway 101 and the primary vehicular route to the La Jolla area of San Diego from the south. The high volume of traffic along the boulevard had been causing safety and air pollution problems. Local residents of the community were concerned about the high speeds and congestion during peak traffic hours, and had issues with crossing the street. The width of La Jolla Boulevard divided the neighborhood, which was also suffering from a lack of usable public space, a lack of parking, and struggling local businesses. The before condition consisted of five lanes, 22,000 ADT, speeds of 40-45mph. Segment has low left turn and minor approach volumes (7-10%)

Findings

- 23,000 ADT¹⁸ post implementation with no congestion complaints. Peak 15 min volume = 583, or 1,166 veh/hr/lane.
- Has friction from 62-118 pedestrian crossings/hr and 13-30 bicyclists per hour.
- Pedestrian crossing distance reduced from 68 feet to 14 feet.
- Increase in on-street parking to 30 spaces.
- Five single lane roundabouts manage flows at intersections.
- Speeds at 15-25 mph.
- 77% noise reduction.
- 30% increase in retail sales.
- New mixed-use development catalyzed.
- 90% decrease in fatalities.



Before Road Diet



After Road Diet

¹⁷ <https://www.pps.org/article/road-diet-la-jolla-a-jewel-of-a-street>

¹⁸ <https://www.slideshare.net/otrec/friday-transportation-seminar-road-diet-v20-road-diet-with-roundabouts>

6.6 PUBLIC INVOLVEMENT

Public Survey Results - July 2020

Q1. Considering the overall VISION for the length of 2nd Avenue from 45th Street/Manchester Expressway to19th Street/Talbotton Road, please rate the level of importance for each study element.

VISIONS	VERY IMPORTANT	NEUTRAL	NOT IMPORTANT	TOTAL
Increase mobility and accessibility for all types of transportation (cars, transit, bicycles, and pedestrians)	86.21% 50	8.62% 5	5.17% 3	58
Promote high standard of quality of life in the corridor	81.03% 47	13.79% 8	5.17% 3	58
Promote green (environmentally-friendly) and resilient infrastructure	77.59% 45	13.79% 8	8.62% 5	58
Create diverse and inclusive public space	70.69% 41	20.69% 12	8.62% 5	58
Gateway and wayfinding signage and aesthetics	67.24% 39	24.14% 14	8.62% 5	58

Q2. Which specific conditions along the corridor are of concern to you?

CONDITIONS	PERCENT CONCERNED	NUMBER CONCERNED
Corridor aesthetics	75.86%	44
Crosswalk locations	68.97%	40
Speeding vehicles	67.24%	39
Sidewalk conditions	63.79%	37
Preservation of historic structures	62.07%	36
Existing buildings	56.90%	33
Crosswalk conditions	51.72%	30
Bus stop conditions	46.55%	27
Riverwalk accessibility	43.10%	25
Overhead utilities	32.76%	19
Sidewalk locations	31.03%	18
Handicap accessibility	31.03%	18
Storm water drainage	24.14%	14
Bus stop locations	17.24%	10
Total Respondents: 58		

Q3. What opportunities do you see to improve the 2nd Avenue corridor?

OPPORTUNITIES	PERCENT CONCERNED	NUMBER CONCERNED
Landscaping or street trees	77.59%	45
Pedestrian facilities (sidewalk or shared path)	75.86%	44
New development for increased business along the corridor	70.69%	41
Traffic calming for vehicles along the corridor	65.52%	38
Bicycle facilities (bicycle lanes or pavement markings)	62.07%	36
Additional pedestrian crossings	60.34%	35
Improved access to the Riverwalk	56.90%	33
Bus stop amenities (benches or shelters)	44.83%	26
Traffic calming for vehicles at intersections or curb cuts	39.66%	23
Raised median islands	29.31%	17
Please list specific opportunities and locations as desired:	17.24%	10
Total Respondents: 58		

Q4. Considering types of design materials, please let us know your preferences.

DESIGN MATERIALS	YES	NEUTRAL	NO	TOTAL
I like brick pavers for use in pedestrian areas	70.91% 39	18.18% 10	10.91% 6	55
I like river rock for use in gateway signage	69.81% 37	24.53% 13	5.66% 3	53
I like traditional-themed site furnishings (benches, pedestrian lighting, litter receptacles, bicycle racks)	60.00% 30	28.00% 14	12.00% 6	50
I like contemporary-themed site furnishings (benches, pedestrian lighting, litter receptacles, bicycle racks)	59.62% 31	25.00% 13	15.38% 8	52
I like brick for use in gateway signage	58.18% 32	32.73% 18	9.09% 5	55
I like granite in retaining walls and paver bands	49.06% 26	43.40% 23	7.55% 4	53
I like cor-ten steel (brown in color) in art installations	45.61% 26	49.12% 28	5.26% 3	57
I like painted steel in art installations	37.74% 20	47.17% 25	15.09% 8	53
I like traditional steel (silver in color) in art installations	26.92% 14	51.92% 27	21.15% 11	52
I like concrete for use in gateway signage	13.46% 7	46.15% 24	40.38% 21	52

6.6 PUBLIC INVOLVEMENT

Public Survey Results - October 2020

Q1. Considering roadway, pedestrian, and transit elements along the corridor, do you agree with the identified improvements?

IMPROVEMENTS	STRONGLY AGREE	SOMEWHAT AGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE	TOTAL
Proposed Four-Lane Roadway	100.00% 2	0	0	0	2
Proposed Raised Center Median	100.00% 2	0	0	0	2
Proposed Sidewalks Adjacent to Roadway	100.00% 2	0	0	0	2
Proposed Pedestrian Crossing Locations	100.00% 2	0	0	0	2
Proposed Bus Shelter Locations	100.00% 2	0	0	0	2

Q2. Considering proposed gateway design materials along the corridor, do you agree with the design and proposed materials?

IMPROVEMENTS	STRONGLY AGREE	SOMEWHAT AGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE	TOTAL
Gateway Signage Design	50.00% 1	0	0	50.00%* 1	2
Use of River Rock in Gateway Installations	100.00% 2	0	0	0	2
Use of Cor-ten Steel in Gateway Installations	0	50.00% 1	50.00% 1	0	2
Use of Painted Steel in Gateway Installations	0	50.00% 1	50.00% 1	0	2

**Note: see detailed comment below.*

"I have a background in national advertising/branding/marketing. I like the sign design itself, but scored "Strongly Disagree" with Signage Design for the use of "Columbus". I would rename this gateway as "Bibb River District". The word "River" is very important as a branding approach for both this more challenged area of the city (a great opportunity to re-brand), and also helps brand Columbus as well using the city's most important feature, the river. 2nd Ave runs along the river, which as an important geographic feature of the city, can be much better used in the marketing/branding of the city. Big missed opportunity if just says "Columbus" on signage. This project all ties together with "Bibb River District" and I expect will create more pride (combined the new streetscape) with area businesses and residents, and more interest throughout the city ("Where is the new xyz business, xyz non-profit, xyz housing, zyx restaurant or xyz event center?" -- "It's in the Bibb River District."). Another way of looking at it is you're putting all of this streetscape investment and using river rock, pedestrian paths towards the river, etc, missing huge marketing opportunity by not adding in 'River' to the name of this gateway and area. Also makes little sense for the sign entering the gateway FROM Columbus to say "Columbus". Finally, you may want to assess different fonts as the current san serif font is flat IMHO -- I think a serif font like Constantia or Georgia would be better to give more pop and serif easier to read (that's why most newspapers/advertising are serif (with "feet"), not san-serif!). Thanks."

Q3. Considering streetscape amenities along the corridor, do you agree with the placement of identified improvements?

IMPROVEMENTS	STRONGLY AGREE	SOMEWHAT AGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE	TOTAL
Proposed Gateway Locations	50.00% 1	50.00% 1	0	0	2
Proposed Pocket Park Near 40 th Street	0	50.00% 1	50.00% 1	0	2
Proposed Street Tree and Lighting Locations	100.00% 2	0	0	0	2
Proposed Brick Paver Locations	100.00% 2	0	0	0	2

**City of Columbus
Georgia**



AECOM

Oct. 2020