

RESOLUTION 2017-43

A RESOLUTION TO SELECT THE CORRIDOR DESIGN CONCEPT FOR THE COLUMBIA AVENUE WIDENING & IMPROVEMENTS PROJECT

WHEREAS, on December 11, 2013, the Nashville Area Metropolitan Planning Organization (MPO) adopted the Transportation Improvement Program (TIP) for Fiscal Years 2014-2017, allocating \$6,000,000.00 in total funding to the Preliminary Engineering (Environmental), Design, and Right-of-Way phases of this project and reserves an additional \$15,000,000.00 in total funding for the Construction Phase; and

WHEREAS, the transportation improvements associated with the project will generally be funded with 80 percent Federal Funds and 20 percent State Funds; and

WHEREAS, on July 14, 2015, the City of Franklin Board of Mayor and Aldermen unanimously approved the Local Agency Project Agreement (COF Contract No. 2014-0289, TDOT Contract No. 140204), which formally began the Columbia Avenue Widening & Improvements Project; and

WHEREAS, the preliminary engineering/environmental phase includes preparation of a National Environmental Policy Act (NEPA) document, technical study determinations (Archaeological, Natural Resources, Noise, and Air Quality), and the development of functional level roadway concept designs, as required by the Federal Highways Administration (FHWA) and TDOT; and

WHEREAS, as part of the preliminary engineering phase, three public meetings were conducted (May 17, 2016; January 31, 2017; May 16, 2017; and August 30, 2017) to engage the corridor users, business owners, and other stakeholders to gather their input on the roadway design; and

WHEREAS, the roadway design concepts developed for Columbia Avenue generally include the following Options: Option 1— Five-Lane Concept (with Access Management) and Option 2—Roundabout Concept, as conceptual shown on Exhibit A; and

WHEREAS, roadway design concepts for Columbia Avenue Project were presented during a public meeting and special Board of Mayor and Aldermen work session on August 30, 2017.

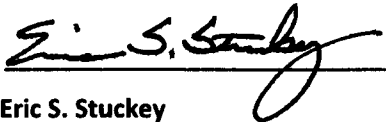
NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF FRANKLIN, TENNESSEE, AS FOLLOWS:

Section 1. The Board of Mayor and Aldermen have selected Option 1 ^(one) as the preferred corridor design concept for the Columbia Ave Widening and Improvements Project as conceptually shown in Exhibit A.

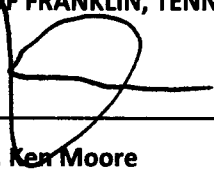
Section 2. City staff is directed to continue to work with impacted property owners and other stakeholders to further develop the preferred corridor design concept and develop recommendations on bike and pedestrian facilities, utility relocation, streetscape improvements, and transit facilities for the proposed project. These options shall be presented back to the Board of Mayor and Aldermen for a final determination prior to proceeding with the design phase of the project.

IT IS SO RESOLVED AND DONE on this 12th day of September 2017

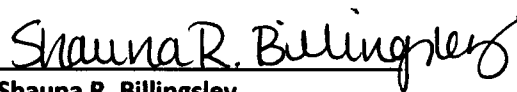
ATTEST:

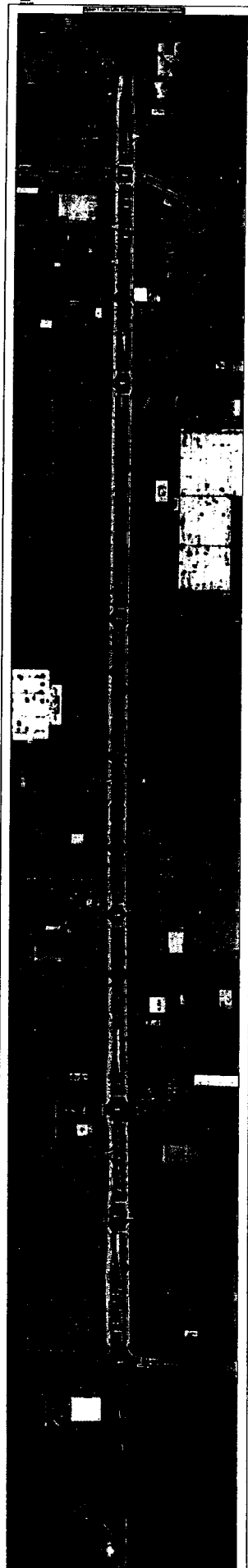
By: 
Eric S. Stuckey
City Administrator

CITY OF FRANKLIN, TENNESSEE:

By: 
Dr. Ken Moore
Mayor

Approved as to Form:

By: 
Shauna R. Billingsley
City Attorney

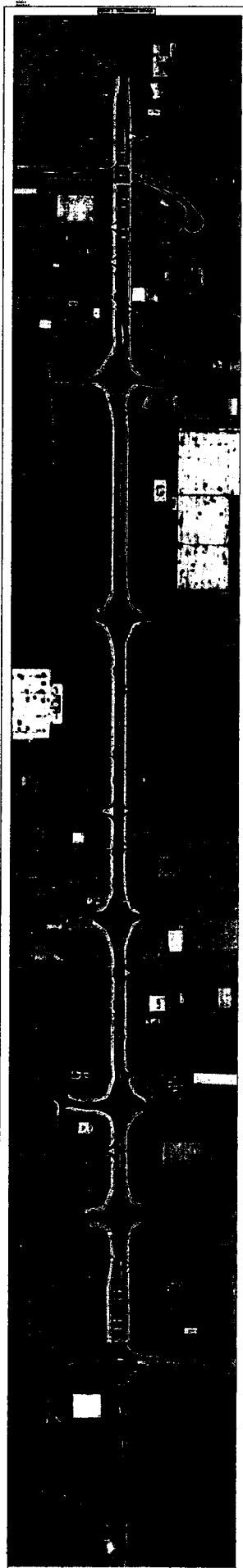


5-Lane Concept
(Access Management)

Columbia Avenue Roadway Concept
Franklin, Tennessee



BWSC



Roundabout Concept

Columbia Avenue Roadway Concept
Franklin, Tennessee

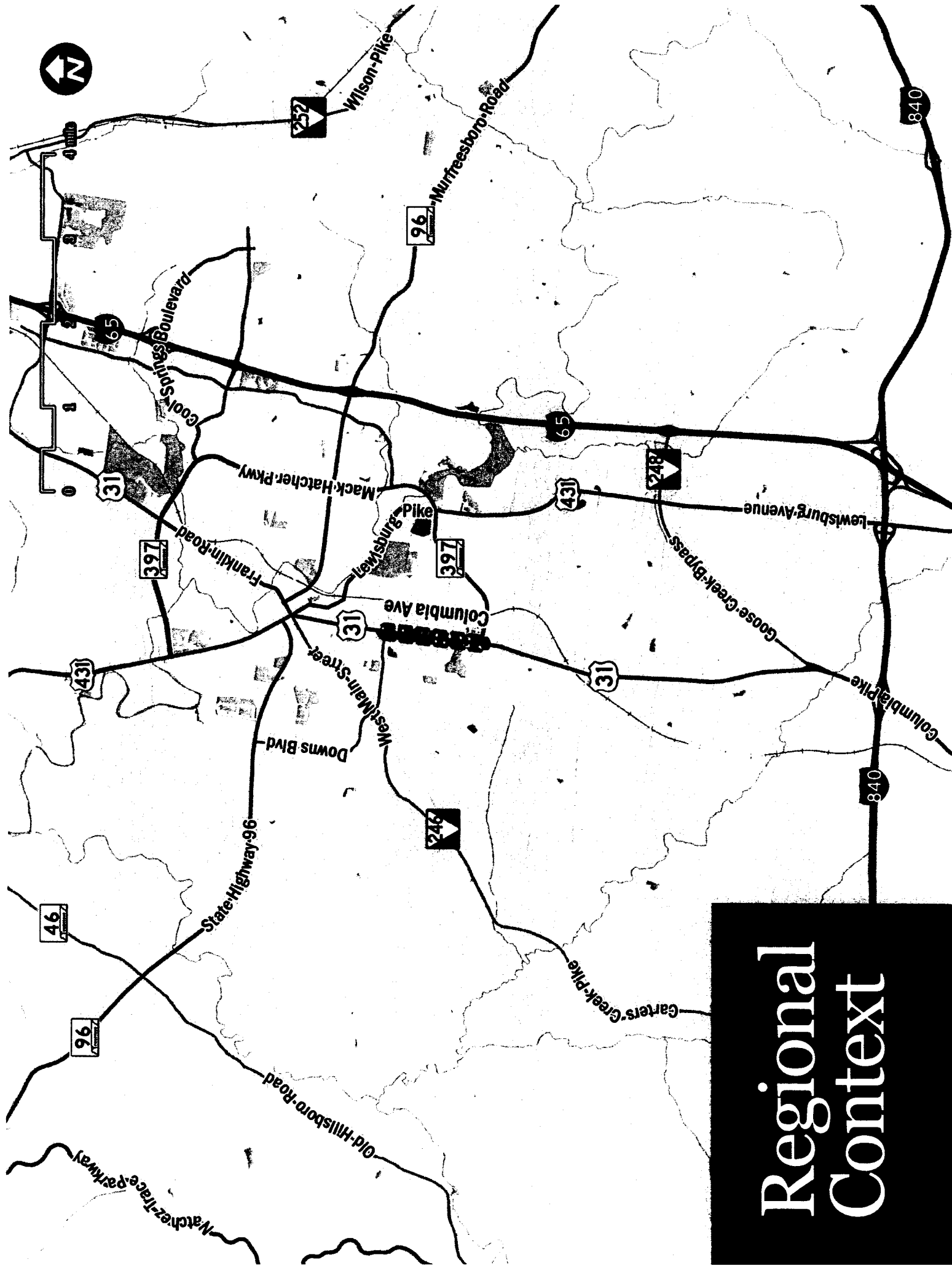


BWSC

— CITY OF FRANKLIN, TENNESSEE —

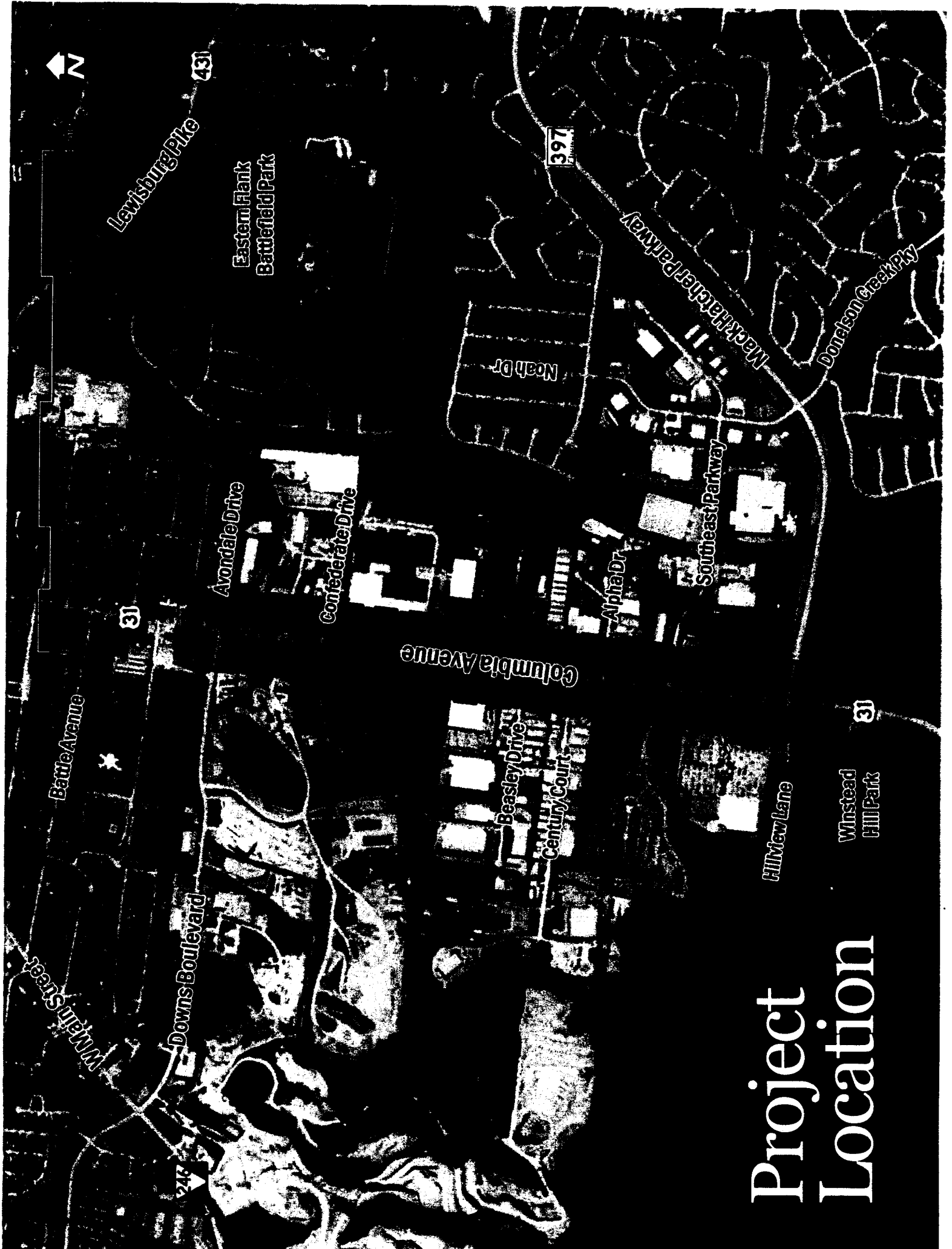
Columbia Avenue

Special BOMA Work Session | August 30, 2017



Regional Context

Project Location



May 2016

18,900

vehicles/day

DAILY
TRAFFIC



TRAFFIC
COMPOSITION

Trucks
7%

11% Peak Trucks

TRAFFIC
TYPE

Local
Trips
55%

April 2016 travel time

from Battle Avenue to
Winstead Elementary School,
in minutes.

3:10
with no traffic

5:10
average day

10:20
longest recorded

Future Growth

2016

EXISTING
CONDITIONS

based on data from City and
TDOT count stations

18,900

vehicles/day

2021

BUILD
YEAR

forecast conditions at
project completion

19,800

vehicles/day

2041

DESIGN
YEAR

improvements are designed to
accommodate 20 years of growth

25,400

vehicles/day

3

components of
comparison

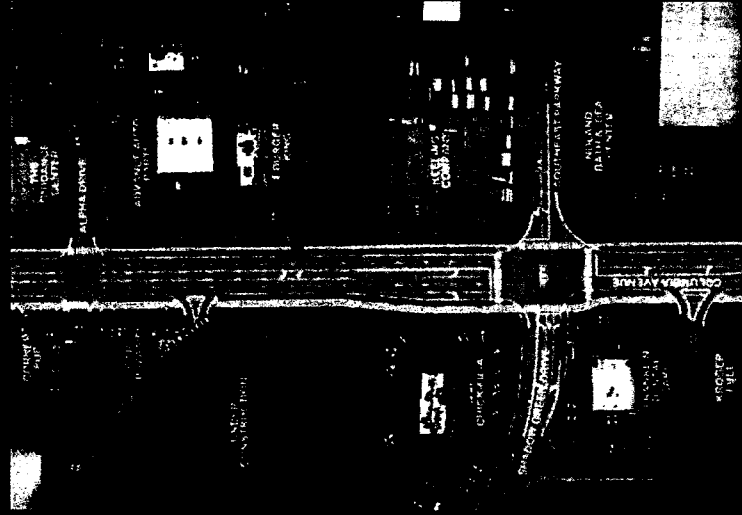
Operations

Safety

Physical
Impact

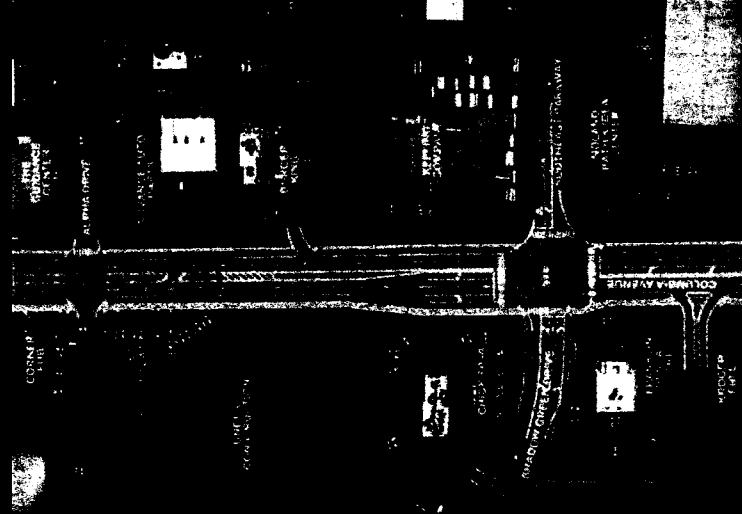
Corridor Concepts

Example: Columbia Avenue at Southeast Parkway



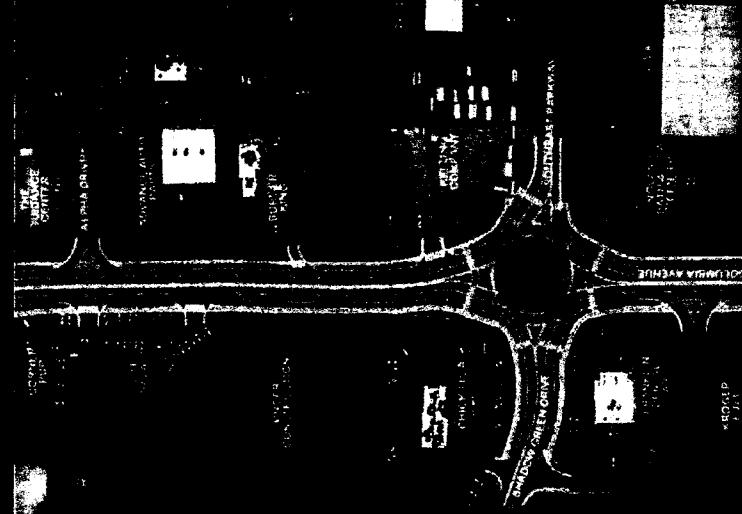
**Five-Lane
Concept**

(Traditional)



**Five-Lane
Concept**

(Access Management)



**Roundabout
Concept**

(Access Management)

Operations

Anticipated Travel Time and Average Speed, 2041 Volumes (Columbia Avenue)

No-Build Conditions	Five-Lane Concept (Traditional)	Five-Lane Concept (Access Mgmt.)	Roundabout Concept
5:50	4:30	4:40	4:30
14.5 mph	18.5 mph	18.1 mph	18.5 mph

Colors are used to illustrate conditions (20 to 40 mph)

Results are averaged and are based on 2041 simulated volumes between the four lanes and volumes of 2041

Operations

Corridor Delay

Existing Conditions
(2016 volumes)

200 seconds

No-Build Conditions
(2041 volumes)

985 seconds

Five-Lane Concept
(Traditional)
(2041 volumes)

365 seconds

Five-Lane Concept
(Access Management)
(2041 volumes)

375 seconds

Roundabout Concept
(2041 volumes)

240 seconds

Columbia Avenue Traffic

Side Street Traffic

Operations

Delay, Level of Service (LOS), and Queue Length

Signalized Intersections		
Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤ 10	Free Flow
B	$10 - 20$	Stable Flow
C	$20 - 35$	Stable Flow (acceptable delays)
D	$35 - 55$	Unstable Flow
E	$55 - 80$	Unstable Flow (intolerable delay)
F	> 80	Unstable Flow (intolerable delay)

Operations

Delay, Level of Service (LOS), and Queue Length

Unsignalized Intersections (i.e. All-Way Stop, Two-Way Stop, Roundabout)		
Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 15	Stable Flow (acceptable delays)
C	>15 – 25	Stable Flow (acceptable delays)
D	>25 – 35	Unstable Flow (intolerable delay)
E	>35 – 50	Unstable Flow (intolerable delay)
F	>50	Unstable Flow (intolerable delay)

NOTE: Two way stop controlled intersections are defined in terms of individual movements

Safety

Collision Data (2013–2016)

7.72
collisions/
MVM

MVM = Million Vehicle-Miles

2.76
collisions/
MVM

1.23
collisions/
MVM

0.68
collisions/
MVM

All Collisions

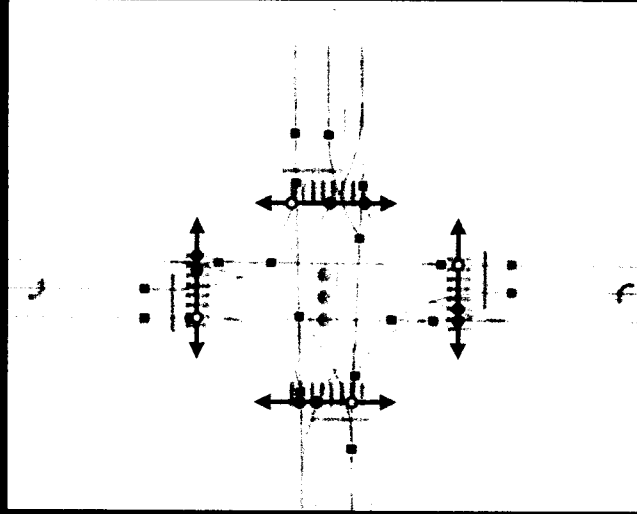
Columbia Avenue Actual Crash History

Fatal/Injury Collisions

Statewide Averages

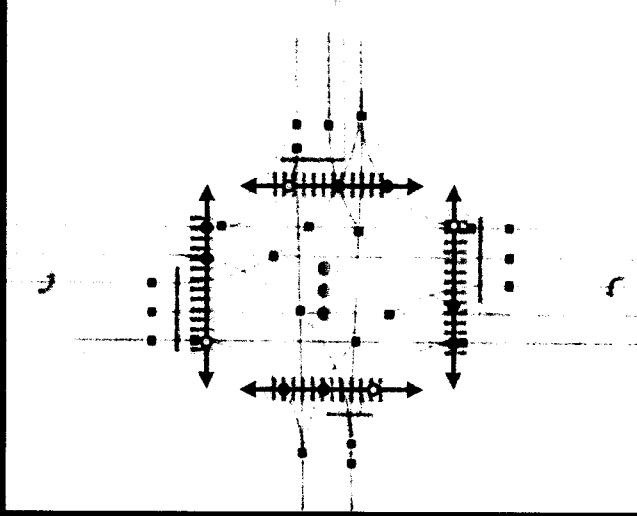
Safety

Columbia Avenue Conflict Points



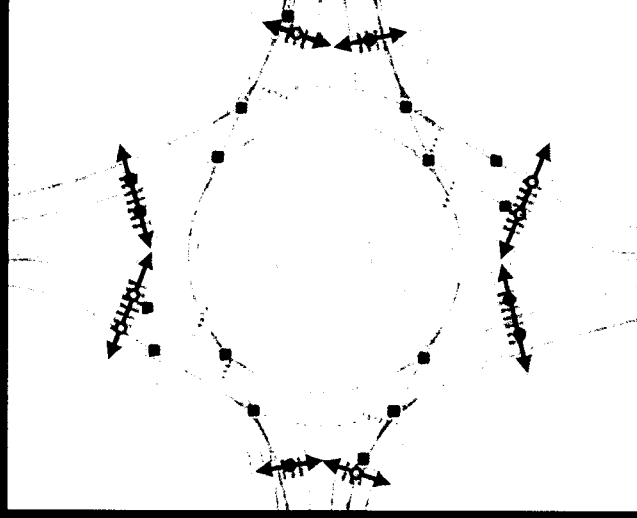
**No-Build
Conditions**

504*



Five-Lane Concepts
(Traditional) (Acc. Mgmt.)

583* 385*



**Roundabout
Concept**

258*

*NOTE: Vehicle Conflict Points

Safety

2041 Anticipated Change in Traffic Collisions

Between Intersections

At Intersections

+41%

+26%

+2%

+1%

-10%

No-Build:

+49% over

2016 conditions

No-Build:

+43% over

2016 conditions

-26%

No-Build Condition (2041)

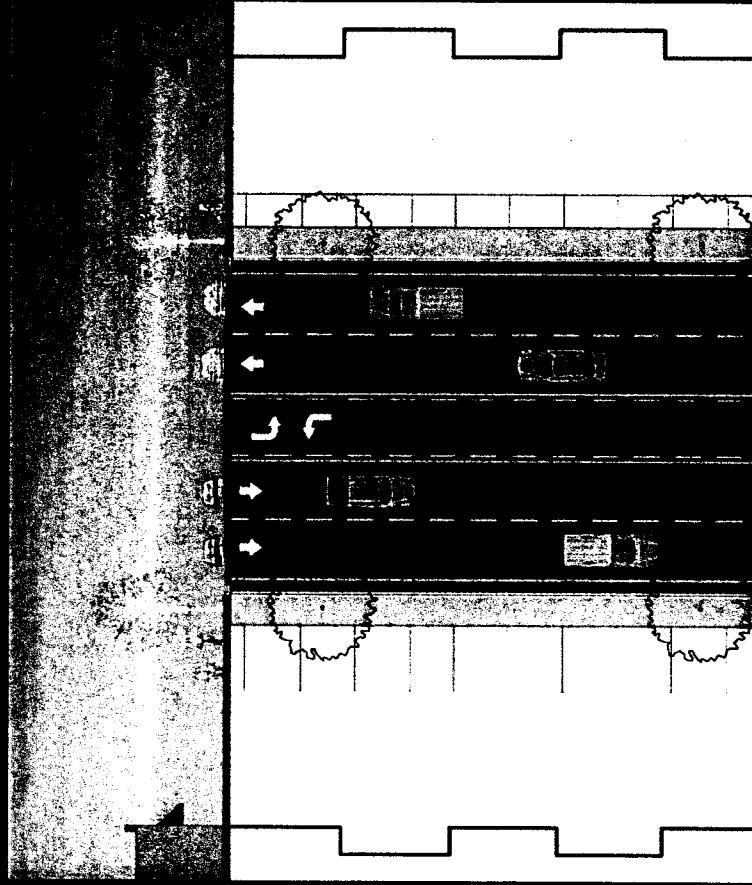
Five-Lane Concept (Traditional)

Five-Lane Concept (Access Management)

Roundabout Concept

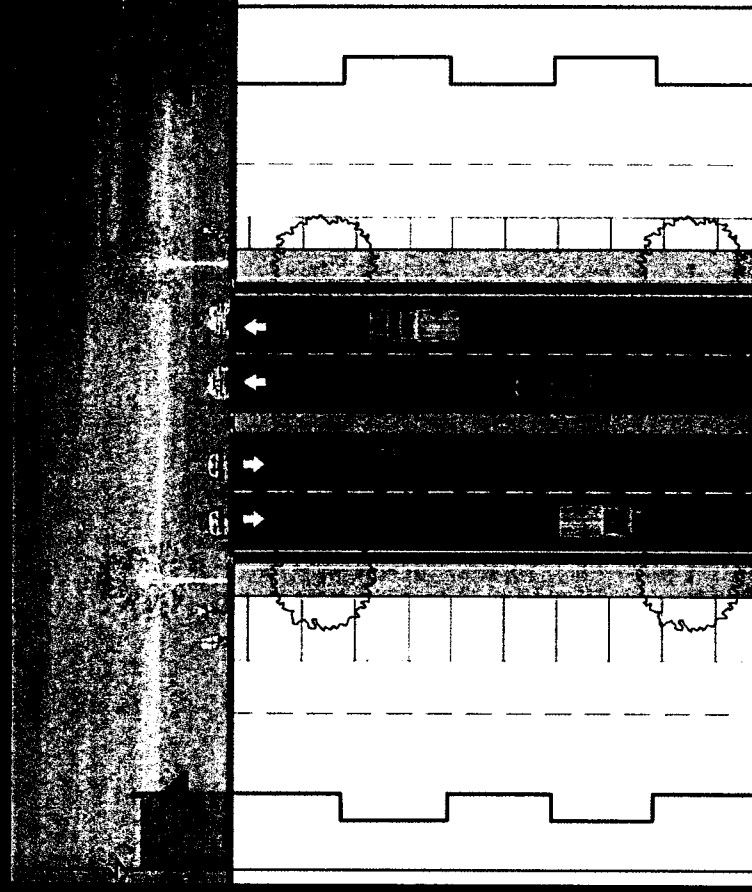
Physical Impact

Typical Sections



Five-Lane Concepts

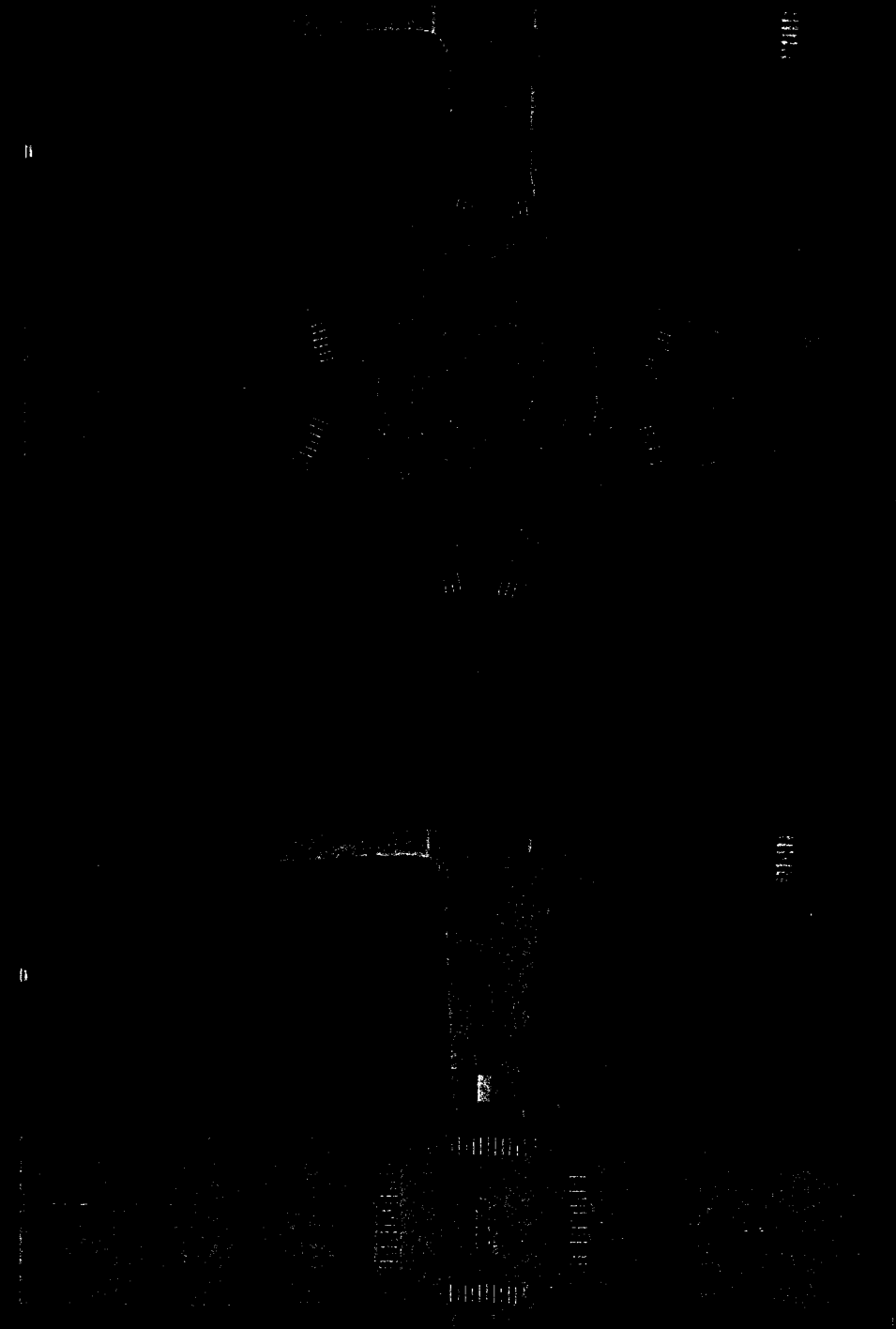
91' wide (back of walk to back of walk)



Roundabout Concept

83' wide (back of walk to back of walk)

Physical Impact



Five-Lane Concepts

Roundabout Concept

Data Summary

	No-Build Conditions (2041 volumes)	5-Lane Concept (Traditional)	5-Lane Concept (Access Mgmt.)	Roundabout Concept
Operational Performance	Through Traffic Delay		145 (sec/veh)	
	Side Street Delay	230 (sec/veh)	230 (sec/veh)	
	Average Travel Time			
Safety Performance	Between Intersections	BASELINE (+49% from 2016)		
	At Intersections	BASELINE (+43% from 2016)		
Physical Impact	Between Intersections			83' (total width)
	At Intersections		AVERAGE footprint	AVERAGE footprint

next step

BOMA selects
preferred concept
to bring forward to
detailed design.

Level of Service (LOS) for No-Build Condition

Cross-Street	Traffic Control Device	Geometry	[AM] Peak Hour						[PM] Peak Hour						[PM] Peak Hour						[SAT] Peak Hour					
			2016 Existing			2021 Future			2016 Existing			2021 Future			2016 Existing			2021 Future			2016 Existing			2021 Future		
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1 Mack Hatcher Parkway / Hillview Lane	Signal	OVERALL	27.8	C	29.3	C	40.9	D	88.6	C	94.3	C	96.5	D	49.3	D	27.8	C	30.5	C	38.0	D	38.0	D	46.2	D
		EASTBOUND (EB)	55.5	E	56.0	E	56.7	E	50.9	D	53.0	D	65.1	E	54.0	D	55.9	E	69.0	E	39.0	D	40.1	D	46.2	D
		EB Left	51.7	D	52.0	D	52.1	D	38.7	D	89.8	D	41.9	D	42.9	D	25.9	C	25.9	C	40.2	D	41.2	D	47.9	D
		EB Thru/Right	55.9	E	56.4	E	57.1	E	54.3	D	56.5	F	71.1	E	54.9	D	57.8	E	71.2	E	39.9	D	40.7	D	47.9	D
		WESTBOUND (WB)	36.7	D	37.2	D	40.1	D	34.4	C	34.8	C	31.9	C	28.0	C	29.5	C	43.8	D	43.8	D	51.2	D	21.5	C
		WB Left	42.5	D	43.0	D	44.5	D	34.4	C	34.8	C	31.9	C	28.0	C	29.5	C	43.8	D	43.8	D	51.2	D	21.5	C
		WB Thru	45.9	D	45.7	D	45.7	D	34.4	C	34.8	C	31.9	C	28.0	C	29.5	C	43.8	D	43.8	D	51.2	D	21.5	C
		WB Right	32.8	C	33.5	C	37.5	D	28.3	C	28.3	C	20.2	C	22.2	C	26.9	C	37.5	D	37.5	D	47.9	D	21.5	C
		NORTHBOUND (NB)	24.4	C	29.1	C	49.6	D	26.1	C	30.1	C	31.5	C	35.8	D	38.6	D	44.6	D	30.9	C	37.9	D	64.5	E
		NB Left	15.4	B	16.3	B	16.8	B	24.1	C	26.8	C	27.5	C	28.4	C	29.5	C	30.6	C	28.4	C	29.5	C	30.6	C
		NB Thru	29.7	C	35.6	D	63.6	E	29.5	C	34.1	C	36.5	D	40.1	D	43.8	D	51.9	D	35.9	D	44.7	D	82.9	F
		NB Right	9.3	A	9.3	A	16.0	B	16.0	B	16.0	B	16.0	B	16.0	B	17.0	B	18.0	B	17.0	B	18.0	B	19.1	B
		SOUTHBOUND (SB)	32.8	C	33.5	C	37.5	D	28.3	C	30.1	C	31.5	C	35.8	D	38.6	D	44.6	D	30.9	C	37.9	D	64.5	E
		SB Left	15.4	B	16.3	B	16.8	B	24.1	C	26.8	C	27.5	C	28.4	C	29.5	C	30.6	C	28.4	C	29.5	C	30.6	C
		SB Thru	29.7	C	35.6	D	63.6	E	29.5	C	34.1	C	36.5	D	40.1	D	43.8	D	51.9	D	35.9	D	44.7	D	82.9	F
		SB Right	9.3	A	9.3	A	16.0	B	16.0	B	16.0	B	16.0	B	16.0	B	17.0	B	18.0	B	17.0	B	18.0	B	19.1	B
2 Parkway Commons / Cemetery	Signal	OVERALL	15.3	B	17.9	B	36.6	C	14.3	B	14.3	B	14.3	B	14.3	B	15.3	B	17.9	B	17.2	C	25.1	C	38.6	D
		EASTBOUND	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E
		EB Left/Thru	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E
		EB Right	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E	58.1	E
		WESTBOUND	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E
		WB Left/Thru/Right	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E	61.7	E
		NORTHBOUND	13.3	B	15.2	B	48.9	D	13.3	B	14.6	B	22.8	C	12.7	B	14.0	B	17.3	B	9.4	A	11.4	A	17.3	B
		NB Left	12.2	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		NB Thru/Right	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SOUTHBOUND	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SB Left	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SB Thru	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SB Right	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SB Thru/Right	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SB Right	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
		SB Thru/Right	11.9	B	14.3	B	48.8	D	11.2	B	12.5	B	20.6	C	10.4	B	12.6	B	15.2	B	8.4	A	10.6	B	16.9	B
3 Southeast Parkway / Shadow Green Drive	Signal	OVERALL	20.0	C	27.9	C	34.2	D	22.9	C	34.1	C	44.8	D	20.3	C	24.5	C	29.9	C	25.0	C	25.7	C	33.0	C
		EASTBOUND	50.1	D	59.9	E	89.6	E	54.2	E	103.1	F	130.7	F	53.0	D	55.0	D	88.0	E	35.0	D	36.4	D	45.3	D
		EB Left	52.9	D	64.6	F	109.5	F	56.4	E	107.9	F	139.6	F	56.4	E	60.2	E	95.0	F	35.0	D	36.4	D	45.3	D
		EB Thru	52.9	D	64.6	F	109.5	F	56.4	E	107.9	F	139.6	F	56.4	E	60.2	E	95.0	F	35.0	D	36.4	D	45.3	D
		EB Right	52.9	D	64.6	F	109.5	F	56.4	E	107.9	F	139.6	F	56.4	E	60.2	E	95.0	F	35.0	D	36.4	D	45.3	D
		WESTBOUND	57.2	E	55.7	E	60.5	E	72.3	E	54.7	D	57.4	E	62.2	E	43.3	D	44.1	E	43.3	D	44.1	E	44.2	D
		WB Left	57.2	E	55.7	E	60.5	E	72.3	E	54.7	D	57.4	E	62.2	E	43.3	D	44.1	E	43.3	D	44.1	E	44.2	D
		WB Thru/Right	57.2	E	55.7	E	60.5	E	72.3	E	54.7	D	57.4	E	62.2	E	43.3	D	44.1	E	43.3	D	44.1	E	44.2	D
		NORTHBOUND	16.5	B	23.0	C	27.2	C	11.9	B	14.6	B	28.6	C	11.9	B	16.2	B	25.6	C	26.2	C	27.9	C	40.9	D
		NB Left	16.5	B	23.0	C	27.2	C	11.9	B	14.6	B	28.6	C	11.9	B	16.2	B	25.6	C	26.2	C	27.9	C	40.9	D
		NB Thru/Right	16.5	B	23.0	C	27.2	C	11.9	B	14.6	B	28.6	C	11.9	B	16.2	B	25.6	C	26.2	C	27.9	C	40.9	D
		SOUTHBOUND	9.9	A	14.5	B	14.7	B	14.8	B	17.0	B	19.7	B	15.2	B	19.7	B	22.7	C	14.3	B	16.9	B	20.4	C
		SB Left	9.9	A	14.5	B	14.7	B	14.8	B	17.0	B	19.7	B	15.2	B	19.7	B	22.7	C	14.3	B	16.9	B	20.4	C
		SB Thru	9.9	A	14.5	B	14.7	B	14.8	B	17.0	B	19.7	B	15.2	B	19.7	B	22.7	C	14.3	B	16.9	B	20.4	C
		SB Right	9.9	A	14.5	B	14.7	B	14.8	B	17.0	B	19.7	B	15.2	B	19.7	B	22.7	C	14.3	B	16.9	B	20.4	C
		SB Thru/Right	9.9	A	14.5	B	14.7	B	14.8	B	17.0	B	19.7	B	15.2	B	19.7	B	22.7	C	14.3	B	16.9	B	20.4	C
4 Alpha Drive	Stop	OVERALL	23.2	C	36.2	E	180.3	F	47.3	E	102.3	F	534.8	F	43.8	E	109.9	F	999.9	F	24.9	C	35.4	E	166.3	F
		EASTBOUND	23.2	C	36.2	E	180.3	F	47.3	E	102.3	F	534.8	F	43.8	E	109.9	F	999.9	F	24.9	C	35.4	E	166.3	F
		EB Left/Thru/Right	23.2	C	36.2	E	180.3	F	47.3	E	102.3	F	534.8	F	43.8	E	109.9	F	999.9	F	24.9	C	35.4	E	166.3	F
		WESTBOUND	13.2	B	17.5	C	37.7	E	11.8	B	18.9	B	25.9	D	10.6	B	11.5	B	15.6	C	11.0	B	12.4	B	18.3	C
		WB Left	13.2	B	17.5	C	37.7	E	11.8	B	18.9	B	25.9	D	10.6	B	11.5	B	15.6	C	11.0	B	12.4	B	18.3	C
		NORTHBOUND	13.2	B	17.5	C	37.7	E	11.8	B	18.9	B	25.9	D	10.6	B	11.5	B	15.6	C	11.0	B	12.4	B	18.3	C
		NB Left	13.2	B	17.5	C	37.7	E	11.8	B	18.9	B	25.9	D	10.6	B	11.5	B	15.6	C	11.0	B	12.4	B	18.3	C
		NB Thru/Right	13.2	B	17.5	C	37.7	E	11.8	B	18.9	B	25.9	D	10.6	B	11.5	B	15.6	C	11.0	B	12.4	B	18.3	C
		SOUTHBOUND	9.4	A	11.7	B	24.4	C	18.3	B	25.1	C	62.3	E	15.7	B	22.5	C	51.7	D	8.3	A	9.9	A	36.3	D
		SB Left	9.4	A	11.7	B	24.4	C	18.3	B	25.1	C	62.3	E	15.7	B	22.5	C	51.7	D	8.3	A	9.9	A	36.3	D
		SB Thru/Right	9.4	A	11.7	B	24.4	C	18.3	B	25.1	C	62.3	E	15.7	B	22.5	C	51.7	D	8.3	A	9.9	A	36.3	D
		NORTHBOUND	10.9	B	12.0	B	18.0	B	8.6	A	12.2	B	22.2	C	7.3	A	8.7	A	13.4	B	22.9	A	3.6	A	8.2	A
		NB Left	8.6	A	11.7	B	24.9	C	10.3	B	18.4	B	25.6	C	12.6	B	25.3	C	36.5	D	22.9	A	3.6	A	8.2	A
		NB Thru/Right	11.2	B	12.1	B	17.1	B	8.4	A	11.5	B	18.0	B	7.0	A	7.8	A	12.1							

Level of Service (LOS) for Five-Lane (Traditional) Concept																			
Cross-Street	Traffic Control Device	Geometry	[AM] Peak Hour				[MD] Peak Hour				[PM] Peak Hour				[SAT] Peak Hour				
			2021 Future		2041 Design		2021 Future		2041 Design		2021 Future		2041 Design		2021 Future		2041 Design		
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1 Mack Hatcher Parkway / Hibview Lane	Signal	OVERALL	28.3	C	23.2	C	21.9	C	22.7	C	23.1	C	30.3	C	21.9	C	23.6	C	
		EASTBOUND (EB)										35.1	D	35.7	D	30.3	C	30.8	C
		EB Left										32.8	C	32.9	C				
		EB Thru										39.5	D	40.9	D	31.9	C	32.3	C
		EB Right										32.6	C	32.8	C				
		WESTBOUND (WB)					21.5	C	21.7	C	26.0	C	29.6	C	18.8	B	19.0	B	
		WB Left					25.1	C	25.2	C	31.8	C	41.3	D	21.2	C			
		WB Thru					23.3	C	23.4	C	32.7	C	32.7	C	26.9	C	26.9	C	
		WB Right					18.2	B	18.4	B	21.0	C	21.4	C	25.8	B	25.9	B	
		NORTHBOUND (NB)	15.6	B	21.0	C	20.5	C	24.1	C	17.5	B	19.7	B	22.8	C	25.5	C	
		NB Left	11.8	B	13.2	B	16.1	B	18.5	B	15.2	B	18.6	B	18.7	B	21.6	C	
		NB Thru	19.1	B	24.5	C	22.7	C	26.8	C	19.0	B	21.7	C	25.4	C	28.4	C	
		NB Right	9.0	A	11.0	B	14.9	B	17.4	B	10.7	B	11.5	B	16.2	B	17.3	B	
		SOUTHBOUND (SB)	20.5	C	24.0	C	19.8	B	20.4	C	22.5	C	36.0	D	20.5	C	23.3	C	
		SB Left	25.1	C	27.2	C	31.9	C	32.5	C	48.8	D	49.8	D	25.2	C	28.8	C	
		SB Thru	16.9	B	21.7	C	8.5	A	8.3	A	12.7	B	31.6	C	17.2	B	19.6	B	
SB Right	8.1	A	9.6	A	11.8	B	13.0	B	10.7	B	30.8	B	13.9	B	14.3	B			
2 Parkway Commons / Cemetery	Signal	OVERALL	7.6	A	8.4	A	10.8	B	23.9	C	14.6	B	17.9	B	16.2	B	18.9	B	
		EASTBOUND					36.9	D	42.6	D									
		EB Left					40.5	D	48.5	D									
		EB Thru/Right									37.9	D	38.0	D	37.2	D	37.9	D	
		WESTBOUND	41.9	D	41.9	D					41.9	D	41.9	D	41.7	D	41.8	D	
		WB Left/Thru/Right	41.9	D	41.9	D					41.9	D	41.9	D	41.7	D	41.8	D	
		NORTHBOUND	6.4	A	7.6	A	22.1	C	24.6	C	18.2	B	21.4	C	20.8	C	23.3	C	
		NB Left	54.1	D	54.7	D	38.7	D	38.4	D	36.5	D	37.2	D	32.1	C	32.6	C	
		NB Thru/Right	8.6	A	9.9	A	20.5	C	23.0	C	16.2	B	19.5	B	18.9	B	22.6	C	
		SOUTHBOUND	4.1	A	4.6	A	10.6	B	16.7	B	6.2	A	11.1	B	6.8	A	10.5	B	
		SB Left																	

Delay Reduction Color Code: **Actualized Green, Time Increase**

Level of Service (LOS) for Five-Lane (Access Management) Concept

Cross-Street	Traffic Control Device	Geometry	[AM] Peak Hour				[MD] Peak Hour				[PM] Peak Hour				[SAT] Peak Hour													
			2021 Future		2041 Design		2021 Future		2041 Design		2021 Future		2041 Design		2021 Future		2041 Design											
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS										
1 Mack Hatcher Parkway / Hillview Lane	Signal	OVERALL	20.9	C	32.2	C	21.8	C	22.7	C	23.1	C	30.2	C	35.1	D	35.7	D	30.8	C	21.7	C	30.6	C				
		EASTBOUND (EB)																										
		EB Left													32.8	C	32.9	C										
		EB Thru													39.3	D	40.9	D			31.9	C	32.3	C				
		EB Right													32.6	C	32.8	C										
		WESTBOUND (WB)						21.5	C	21.7	C	28.0	C	29.6	C	31.8	C	41.3	D	18.8	B	21.2	C	21.2	C			
		WB Left						25.1	C	25.2	C	32.7	C	32.7	C	32.7	C	32.7	C	26.9	C	26.9	C	26.9	C			
		WB Thru																										
		WB Right						18.2	B	18.4	B	22.0	C	21.4	C	22.0	C	21.4	C	15.8	B	15.9	B	15.9	B			
		NORTHBOUND (NB)	16.6	B	21.0	C	20.5	C	24.1	C	17.5	B	19.7	B	22.9	C	25.5	C	25.5	C	25.5	C	25.5	C	25.5	C		
		NB Left	21.8	B	21.2	B	16.1	B	18.5	B	15.2	B	18.6	B	18.7	B	21.6	C	21.6	C	21.6	C	21.6	C	21.6	C		
		NB Thru	19.1	B	24.5	C	22.7	C	26.8	C	18.0	B	21.2	C	25.4	C	28.4	C	28.4	C	28.4	C	28.4	C	28.4	C		
		NB Right	9.0	A	11.0	B	14.9	B	17.4	B	10.7	B	11.5	B	16.2	B	17.3	B	17.3	B	17.3	B	17.3	B	17.3	B		
		SOUTHBOUND (SB)	20.5	C	24.0	C	19.8	B	20.4	C	22.4	C	22.4	C	20.5	C	23.3	C	20.5	C	23.3	C	23.3	C	23.3	C		
		SB Left	25.1	C	27.2	C	22.0	C	22.5	C	48.7	D	48.8	D	24.8	C	24.8	C	24.8	C	24.8	C	24.8	C	24.8	C		
		SB Thru	16.9	B	21.6	C	6.5	A	9.3	A	12.7	B	11.6	C	17.2	B	17.2	B	17.2	B	17.2	B	17.2	B	17.2	B		
		SB Right	8.1	A	9.6	A	11.8	B	13.0	B	10.7	B	10.8	B	11.9	B	14.3	B	14.3	B	14.3	B	14.3	B	14.3	B		
2 Parkway Commons / Cemetery	Signal	OVERALL	7.8	A	8.4	A	19.3	B	23.0	C	14.4	B	17.3	B	16.2	B	16.2	B	16.2	B	16.2	B	16.2	B	16.2	B		
		EASTBOUND																										
		EB Left													40.5	D	42.6	D			37.2	D	37.9	D				
		EB Thru/Right																										
		WESTBOUND	41.9	D	41.9	D					41.9	D	41.9	D	41.7	D	41.7	D	41.7	D	41.7	D	41.7	D	41.7	D		
		WB Left/Thru/Right	41.9	D	41.9	D					41.9	D	41.9	D	41.7	D	41.7	D	41.7	D	41.7	D	41.7	D	41.7	D		
		NORTHBOUND	6.4	A	7.6	A	22.1	C	24.6	C	18.2	B	24.1	C	20.8	C	23.3	C	20.8	C	23.3	C	23.3	C	23.3	C		
		NB Left	54.1	D	54.7	D	36.7	D	38.4	D	36.5	D	37.2	D	32.1	C	32.6	C	32.1	C	32.6	C	32.6	C	32.6	C		
		NB Thru/Right	3.6	A	4.9	A	20.5	C	23.0	C	16.2	B	19.5	B	19.9	B	22.6	C	19.9	B	22.6	C	22.6	C	22.6	C		
		SOUTHBOUND	4.1	A	4.6	A	10.6	B	16.7	B	6.1	A	11.1	B	6.8	A	10.5	B	6.8	A	10.5	B	10.5	B	10.5	B		
		SB Left	29.3	C	29.7	C																						
		SB Thru/Right	4.0	A	4.6	A	10.5	B	16.6	B	6.1	A	11.0	B	6.8	A	10.5	B	6.8	A	10.5	B	10.5	B	10.5	B		
		OVERALL	14.3	B	17.8	B	18.4	B	19.2	B	18.8	B	19.0	B	11.1	B	14.3	B	11.1	B	14.3	B	14.3	B	14.3	B		
		EASTBOUND	21.7	C	28.7	C	30.6	C	32.3	C	29.9	C	30.1	C	26.0	C	29.3	C	26.0	C	29.3	C	29.3	C	29.3	C		
		EB Left	29.3	C	32.6	C	32.7	C	36.0	D	32.4	C	33.5	C	27.4	C	31.2	C	27.4	C	31.2	C	31.2	C	31.2	C		
		EB Thru																										
		EB Right																										
WESTBOUND	35.9	D	36.0	D	34.7	C	35.1	D	35.9	D	35.8	D	35.4	D	36.2	D	35.4	D	36.2	D	36.2	D	36.2	D				
WB Left	39.3	D	39.3	D	29.4	C	29.6	C	30.1	C	30.2	C																
WB Thru/Right	36.2	D	36.3	D	37.0	D	37.6	D	36.6	D	37.1	D	35.9	D	36.9	D	35.9	D	36.9	D	36.9	D	36.9	D				
NORTHBOUND	7.9	A	10.8	B	9.7	A	12.4	B	17.3	B	19.0	B	9.5	A	12.4	B	9.5	A	12.4	B	12.4	B	12.4	B				
NB Left	3.8	A	4.5	A	8.2	A	22.0	C	27.8	C	45.1	D	35.8	B	29.4	C	35.8	B	29.4	C	29.4	C	29.4	C				
NB Thru/Right	8.3	A	11.5	B	9.9	A	10.9	B					8.0	A	8.6	A	8.0	A	8.6	A	8.6	A	8.6	A				
SOUTHBOUND	13.4	B	18.7	B	12.0	B	16.1	B	10.2	B	13.7	B																
SB Left	16.3	B	27.3	C	11.3	B	20.0	C	7.5	A	8.3	A	8.8	A	10.6	B	8.8	A	10.6	B	10.6	B	10.6	B				
SB Thru	13.2	B	12.9	B	14.2	B	18.4	B	11.6	B	15.7	B	14.1	B	14.6	B	14.1	B	14.6	B	14.6	B	14.6	B				
SB Right	9.9	A	11.3	B	0.3	A	0.4	A	0.1	A	0.1	A																
4 Alpha Drive	Two-Way Stop Control (TWSC)	EASTBOUND	14.6	B	16.4	C	12.6	B	13.9	B	14.9	B	17.1	C	15.2	C	18.0	C	15.2	C	18.0	C	18.0	C	18.0	C		
		EB Left/Thru/Right	14.6	B	16.4	C	12.6	B	13.9	B	14.9	B	17.1	C	15.2	C	18.0	C	15.2	C	18.0	C	18.0	C	18.0	C		
		WESTBOUND	12.8	B	14.7	B	18.8	C	22.4	C	17.7	C	24.1	C	12.8	B	14.4	B	12.8	B	14.4	B	14.4	B	14.4	B		
		WB Left/Thru/Right	12.8	B	14.7	B	18.8	C	22.4	C	17.7	C	24.1	C	12.8	B	14.4	B	12.8	B	14.4	B	14.4	B	14.4	B		
		NORTHBOUND	9.0	A	9.4	A	10.0	B	10.8	B	10.6	B	11.9	B	10.4	B	11.6	B	10.4	B	11.6	B	11.6	B	11.6	B		
		NB Left	9.0	A	9.4	A	10.0	B	10.8	B	10.6	B	11.9	B	10.4	B	11.6	B	10.4	B	11.6	B	11.6	B	11.6	B		
		NB Thru/Right	10.9	B	11.2	B	10.6	B	11.7	B	9.8	A	10.7	B	9.9	A	10.8	B	9.9	A	10.8	B	10.8	B	10.8	B		
		SB Left	10.9	B	11.2	B	10.6	B	11.7	B	9.8	A	10.7	B	9.9	A	10.8	B	9.9	A	10.8	B	10.8	B	10.8	B		
		SOUTHBOUND	7.7	A	8.6	A	7.7	A	9.6	A	4.2	A	7.3	A	4.9	A	5.2	A	4.9	A	5.2	A	5.2	A	5.2	A		
		OVERALL	7.7	A	8.6	A	7.7	A	9.6	A	4.2	A	7.3	A	4.9	A	5.2	A	4.9	A	5.2	A	5.2	A	5.2	A		
		EASTBOUND	35.8	D	36.3	D	36.1	D	36.6	D																		
		EB Left	36.3	D	39.9	D	39.8	D	42.0	D																		
		EB Thru/Right																										
		WESTBOUND																										
		WB Left/Thru/Right																										
		6 Beasley Drive / Lumber Drive	TWSC	OVERALL	18.5	B	14.5	B	15.3	C	17.6	C	15.0	C	16.7	C	15.3	C	18.0	C	15.3	C	18.0	C	18.0	C	18.0	C
				EB Left/Thru/Right	18.5	B	14.5	B	15.3	C	17.6	C	15.0	C	16.7	C	15.3	C	18.0	C	15.3	C	18.0	C	18.0	C	18.0	C
WESTBOUND	13.9			B	14.7	B	17.0	C	21.9	C	18.0	C	22.6	C	13.9	B	14.8	B	13.9	B	14.8	B	14.8	B	14.8	B		
WB Left/Thru/Right	13.9			B	14.7	B	17.0	C	21.9	C	18.0	C	22.6	C	13.9	B	14.8	B	13.9	B	14.8	B	14.8	B	14.8	B		
NORTHBOUND	10.3			B	11.4	B	10.6	B	11.7	B	10.4	B	11.4	B	10.4	B	11.5	B	10.4	B	11.5	B	11.5	B	11.5	B		
NB Left	10.3			B	11.4	B	10.6	B	11.7	B	10.4	B	11.4	B	10.4	B	11.5	B	10.4	B	11.5	B	11.5	B	11.5	B		
SOUTHBOUND	10.6			B	11.7	B	10.8	B	12.0	B	10.1	B	11.2	B	10.6	B	11.9	B	10.6	B	11.9	B	11.9	B	11.9	B		
SB Left	10.6			B	11.7	B	10.8	B	12.0	B	10.1	B	11.2	B	10.6	B	11.9	B	10.6	B	11.9	B	11.9	B	11.9	B		
OVERALL	4.4			A	4.8	A	5.8	A	7.2	A	4.4	A	5.9	A	6.4	A	5.2	A	6.4	A	5.2	A	5.2	A	5.2	A		
WESTBOUND	41.4			D	41.7	D																						
WB Left	42.8			D	43.5	D	40.6	D	40.6	D																		
WB Right	40.3			D	40.4	D																						
NORTHBOUND	3.8			A	4.4	A	5.8	A	8.6	A	4.9	A	7.3	A	7.0	A</												

Level of Service (LOS) for Roundabout Concept

Cross-Street	Traffic Control Device	Geometry	[AM] Peak Hour				[MD] Peak Hour				[PM] Peak Hour				[SAT] Peak Hour			
			2021 Future		2041 Design		2021 Future		2041 Design		2021 Future		2041 Design		2021 Future		2041 Design	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1 Mack Hatcher Parkway / Hillview Lane	Signal	OVERALL	20.7	C	22.6	C	23.6	C	25.0	C	25.7	C	33.9	C	25.3	C	28.4	C
		EASTBOUND (EB)																
		EB Left																
		EB Thru																
		EB Right																
		WESTBOUND (WB)					21.7	C	21.7	C	26.0	C	31.3	C	18.9	B	19.1	B
		WB Left					25.1	C	25.1	C	31.8	C	45.3	D	21.2	C	21.3	C
		WB Thru									32.2	C	33.6	C	27.0	C	27.0	C
		WB Right					18.5	B	18.5	B	21.0	C	22.0	C	15.8	B	16.0	B
		NORTHBOUND (NB)	15.9	B	19.9	B	19.6	B	23.1	C	17.5	B	19.1	B	23.2	C	25.9	C
		NB Left	11.6	B	13.0	B	15.5	B	18.0	B	15.2	B	19.4	B	18.1	B	21.4	C
		NB Thru	18.2	B	28.1	C	21.7	C	23.6	C	19.0	B	20.6	C	25.9	C	29.1	C
		NB Right	8.8	A	10.8	B	14.4	B	16.9	B	10.7	B	11.1	B	16.4	B	17.4	B
		SOUTHBOUND (SB)	22.2	C	23.9	C	24.8	C	26.8	C	28.7	C	43.7	D	29.7	C	35.8	D
		SB Left	35.3	D	35.6	D	33.8	C	34.1	C					35.3	D	37.1	D
		SB Thru	10.8	B	13.9	B	17.0	B	20.9	C	27.1	C	48.7	D	28.3	C	36.0	D
		SB Right	8.0	A	9.6	B	11.7	B	12.9	B					14.9	B	15.4	B
2 Parkway Commons / Cemetery	Roundabout	OVERALL	7.2	A	8.8	A	8.5	A	11.2	B	7.9	A	10.3	B	7.1	A	6.9	A
		EASTBOUND	7.0	A	8.5	A	11.9	B	18.5	C	11.2	B	17.0	C	9.3	A	13.1	B
		EB Left/Thru/U-Turn	7.1	A	8.7	A	12.9	B	20.7	C	11.7	B	18.2	C	9.8	A	14.1	B
		EB Right	6.6	A	7.7	A	8.9	A	11.4	B	10.4	B	14.7	B	8.4	A	11.1	B
		WESTBOUND	8.6	A	10.9	B	8.4	A	10.7	B	7.0	A	8.5	A	6.8	A	8.4	A
		WB Left/Thru/Right/U-Turn	8.6	A	10.9	B	8.4	A	10.7	B	7.0	A	8.5	A	6.8	A	8.4	A
		NORTHBOUND	8.1	A	10.3	B	8.2	A	10.6	B	7.3	A	9.0	A	7.0	A	8.7	A
		NB Left/Thru/U-Turn	8.1	A	10.3	B	8.2	A	10.6	B	7.3	A	9.0	A	7.0	A	8.7	A
		NB Thru/Right	8.1	A	10.3	B	8.2	A	10.6	B	7.3	A	9.0	A	7.0	A	8.7	A
		SOUTHBOUND	5.9	A	6.8	A	7.7	A	9.3	A	7.6	A	9.5	A	6.6	A	7.8	A
		SB Left/Thru/U-Turn	5.9	A	6.8	A	7.7	A	9.3	A	7.6	A	9.5	A	6.6	A	7.8	A
		SB Thru/Right	5.9	A	6.8	A	7.7	A	9.3	A	7.6	A	9.5	A	6.6	A	7.8	A
		OVERALL	10.3	B	15.0	C	13.0	B	20.9	C	10.7	B	15.8	C	10.0	B	14.2	B
		EASTBOUND	10.2	B	13.7	B	18.6	C	35.2	E	13.2	B	20.7	C	12.7	B	20.4	C
		EB Left/Thru/U-Turn	10.5	B	14.2	B	18.9	C	38.0	E	13.3	B	20.0	C	12.0	B	18.2	C
		EB Right	10.0	B	13.3	B	17.4	C	31.9	D	13.2	B	21.2	C	13.1	B	21.9	C
		WESTBOUND	14.4	B	23.5	C	15.3	C	25.5	D	10.8	B	15.4	C	10.0	B	13.8	B
WB Left/Thru/U-Turn	12.0	B	16.4	C	16.1	C	26.9	D	10.7	B	14.5	B	10.0	B	13.4	B		
WB Right	15.1	C	25.3	D	14.6	B	24.3	C	11.0	B	15.9	C	10.0	B	14.1	B		
NORTHBOUND	12.1	B	18.8	C	11.7	B	17.7	C	8.2	A	10.4	B	9.0	A	12.1	B		
NB Left/Thru/U-Turn	12.1	B	18.8	C	11.7	B	17.7	C	8.2	A	10.4	B	9.0	A	12.1	B		
NB Thru/Right	12.1	B	18.8	C	11.7	B	17.7	C	8.2	A	10.4	B	9.0	A	12.1	B		
SOUTHBOUND	7.0	A	8.5	A	11.4	B	17.2	C	12.1	B	19.0	C	9.9	A	14.0	B		
SB Left/Thru/U-Turn	7.0	A	8.5	A	11.4	B	17.2	C	12.1	B	19.0	C	9.9	A	14.0	B		
SB Thru/Right	7.0	A	8.5	A	11.4	B	17.2	C	12.1	B	19.0	C	9.9	A	14.0	B		
4 Alpha Drive	Two-Way Stop Control (TWSC)	EASTBOUND	11.2	B	12.1	B	13.0	B	14.7	B	14.1	B	16.3	C	13.6	B	15.5	C
		EB Left/Thru/Right	11.2	B	12.1	B	13.0	B	14.7	B	14.1	B	16.3	C	13.6	B	15.5	C
		WESTBOUND	15.0	C	18.4	C	17.9	C	26.5	D	14.8	B	18.7	C	14.5	B	17.9	C
		WB Left/Thru/Right	15.0	C	18.4	C	17.9	C	26.5	D	14.8	B	18.7	C	14.5	B	17.9	C
5 Century Court	Roundabout	OVERALL	9.0	A	12.0	B	10.9	B	16.0	C	8.7	A	11.6	B	7.7	A	9.8	A
		EASTBOUND	8.3	A	10.8	B	13.3	B	20.8	C	12.2	B	18.6	C	9.6	A	13.0	B
		EB Left/Thru/U-Turn	8.2	A	10.6	B	13.7	B	21.1	C	12.5	B	18.5	C	9.2	A	12.4	B
		EB Right	8.5	A	11.0	B	13.0	B	20.6	C	12.1	B	18.7	C	10.2	B	13.9	B
		WESTBOUND	10.3	B	13.4	B	11.0	B	14.5	B	8.0	A	10.1	B	7.7	A	9.6	A
		WB Left/Thru/Right/U-Turn	10.3	B	13.4	B	11.0	B	14.5	B	8.0	A	10.1	B	7.7	A	9.6	A
		NORTHBOUND	10.0	B	13.8	B	11.2	B	16.7	C	7.9	A	10.1	B	7.6	A	9.5	A
		NB Left/Thru/U-Turn	10.0	B	13.8	B	11.2	B	16.7	C	7.9	A	10.1	B	7.6	A	9.5	A
		NB Thru/Right	10.0	B	13.8	B	11.2	B	16.7	C	7.9	A	10.1	B	7.6	A	9.5	A
		SOUTHBOUND	7.8	A	9.7	A	10.0	B	14.1	B	8.8	A	11.8	B	7.7	A	9.7	A
		SB Left/Thru/U-Turn	7.8	A	9.7	A	10.0	B	14.1	B	8.8	A	11.8	B	7.7	A	9.7	A
		SB Thru/Right	7.8	A	9.7	A	10.0	B	14.1	B	8.8	A	11.8	B	7.7	A	9.7	A
		OVERALL	13.0	B	15.1	C	15.2	C	19.8	C	16.7	C	23.0	C	16.3	C	21.5	C
		EASTBOUND	13.0	B	15.1	C	15.2	C	19.8	C	16.7	C	23.0	C	16.3	C	21.5	C
		EB Right	13.0	B	15.1	C	15.2	C	19.8	C	16.7	C	23.0	C	16.3	C	21.5	C
		WESTBOUND	13.3	B	15.1	C	14.9	B	18.2	C	13.5	B	15.7	C	14.6	B	17.5	C
		WB Right	13.3	B	15.1	C	14.9	B	18.2	C	13.5	B	15.7	C	14.6	B	17.5	C
7 Franklin Business Park (North) / Future Werthan Circle	Roundabout	OVERALL	7.4	A	9.1	A	7.6	A	9.4	A	6.8	A	8.0	A	7.9	A	10.3	B
		WESTBOUND	9.7	A	12.9	B	10.5	B	14.5	B	7.7	A	9.4	A	12.2	B	20.0	C
		WB Left/Right/U-Turn	9.7	A	12.9	B	10.5	B	14.5	B	7.7	A	9.4	A	12.2	B	20.0	C
		NORTHBOUND	7.7	A	9.4	A	7.4	A	8.9	A	6.6	A	7.5	A	6.9	A	8.4	A
		NB Thru/U-Turn	7.7	A	9.4	A	7.4	A	8.9	A	6.6	A	7.5	A	6.9	A	8.4	A
		NB Thru/Right	7.7	A	9.4	A	7.4	A	8.9	A	6.6	A	7.5	A	6.9	A	8.4	A
		SOUTHBOUND	6.9	A	8.4	A	7.6	A	9.5	A	7.0	A	8.5	A	8.0	A	10.3	B
		SB Left/Thru/U-Turn	6.9	A	8.4	A	7.6	A	9.5	A	7.0	A	8.5	A	8.0	A	10.3	B
		SB Thru	6.9	A	8.4	A	7.6	A	9.5	A	7.0	A	8.5	A	8.0	A	10.3	B
		OVERALL	8.2	A	10.3	B	7.8	A	9.7	A	6.5	A	7.7	A	7.0	A	7.9	A
		EASTBOUND	9.1	A	12.0	B	8.6	A	10.9	B	7.6	A	9.4	A	8.3	A	8.7	A
		EB Left/Thru/Right/U-Turn	9.1	A	12.0	B	8.6	A	10.9	B	7.6	A	9.4	A	8.3	A	8.7	A
		WESTBOUND	10.3	B	14.0	B	10.6	B	14.8	B	7.7	A	9.8	A	8.1	A	10.4	B
		WB Left/Thru/Right/U-Turn	10.3	B	14.0	B	10.6	B	14.8	B	7.7	A	9.8	A	8.1	A	10.4	B
		NORTHBOUND	8.6	A	11.0	B	8.1	A	10.0	B	6.3	A	7.5	A	6.9	A	8.3	A
		NB Left/Thru/U-Turn	8.6	A	11.0	B	8.1	A	10.0	B	6.3	A	7.5	A	6.9	A	8.3	A
		NB Thru/Right	8.6	A	11.0	B	8.1	A	10.0	B	6.3	A	7.5	A	6.9	A	8.3	A
SOUTHBOUND	7.4	A	9.0	A	7.2	A	8.6	A	6.6	A	7.8	A	6.9	A	7.2	A		
SB Left/Thru/U-Turn	7.4	A	9.0	A	7.2	A	8.6	A	6.6	A	7.8	A	6.9	A	7.2	A		
SB Thru/Right	7.4	A	9.0	A	7.2	A	8.6	A	6.6	A	7.8	A	6.9	A	7.2	A		
9 Carr Avenue	Stop	WESTBOUND	10.8	B	11.5	B	11.0	B	11.9	B	10.9	B	11.8	B	11.4	B	12.4	B
		WB Right	10.8	B	11.5	B	11.0	B	11.9	B	10.9	B	11.8	B	11.4	B	12.4	B
		OVERALL	17.7	B	19.2	B	17.6	B	19.4	B	19.8	B	22.2	C	21.6	C	25.6	C
		EASTBOUND	22.7	D	23.2	D	29.6	C	30.7	C	29.1	C	30.4	C	32.2	C	35.4	D
10 Downs Boulevard	Signal	EB Left	42.7	D	44.6	D	42.4	D	43.6	D	43.0	D	44.8	D				
		EB Thru																
		EB Right																
		WESTBOUND																
		WB Left	36.4	D	36.6	D												
		WB Thru/Right																
		NORTHBOUND					15.6	B	16.3	B	18.5	B	18.7	B	26.9	B	17.3	B
		NB Left					37.1	D	37.3	D								
		NB Thru/Right	3.9	A	5.2	A	3.7	A	4.8	A	3.4	A	4.4	A	4.2	A	6.2	A
		SOUTHBOUND																

Queue Length for No-Build Condition

Cross-Street	Traffic Control Device	Geometry	Storage Length	[AM] Peak Hour			[MD] Peak Hour			[PM] Peak Hour			[SAT] Peak Hour		
				Queue Length (Feet)			Queue Length (Feet)			Queue Length (Feet)			Queue Length (Feet)		
				2016	2021	2041	2016	2021	2041	2016	2021	2041	2016	2021	2041
1 Mack Hatcher Parkway / Hillview Lane	Signal	EASTBOUND (EB)													
		EB Left	150' (6 veh)	13'	13'	15'	56'	62'	73'	28'	29'	32'	28'	29'	33'
		EB Thru/Right	450' (18 veh)	58'	60'	68'	205'	268'	353'	211'	234'	321'	202'	212'	305'
		WESTBOUND (WB)													
		WB Left	640' (25 veh)	147'	155'	185'	96'	107'	127'	214'	224'	349'	86'	89'	106'
		WB Thru	999' (40 veh)	81'	86'	96'	110'	116'	139'	108'	112'	133'	109'	113'	136'
		WB Right	325' (13 veh)	60'	116'	230'	99'	45'	154'	42'	79'	167'	92'	95'	73'
		NORTHBOUND (NB)													
		NB Left	200' (8 veh)	36'	37'	44'	57'	55'	61'	53'	53'	61'	81'	84'	100'
		NB Thru	775' (31 veh)	587'	678'	1012'	325'	362'	419'	416'	493'	643'	355'	468'	613'
		NB Right	200' (8 veh)	15'	18'	27'	15'			14'	14'	19'	15'	15'	21'
		SOUTHBOUND (SB)													
		SB Left	300' (12 veh)	161'	214'	277'	210'	252'	323'	164'	184'	214'	169'	194'	204'
		SB Thru	560' (22 veh)	9'	17'	75'	892'	476'	556'	762'	823'	1117'	420'	474'	607'
		SB Right	400' (16 veh)	0'	0'	0'			1'	0'	0'	0'	0'		
2 Parkway Commons / Cemetery	Signal	EASTBOUND													
		EB Left/Thru	175' (7 veh)	108'	112'	131'	292'	313'	413'	198'	218'	276'	176'	185'	224'
		EB Right	175' (7 veh)	0'	0'	0'	21'	28'	38'	32'	36'	43'	25'	30'	33'
		WESTBOUND													
		WB Left/Thru/Right	250' (10 veh)	12'	12'	12'	45'	47'	52'	12'	12'	12'	18'	18'	20'
		NORTHBOUND													
		NB Left	50' (2 veh)	23'	23'	25'	41'	46'	55'	41'	42'	48'	25'	26'	27'
		NB Thru/Right	150' (6 veh)	1003'	1188'	1530'	286'	306'	355'	245'	282'	3046'	217'	761'	900'
		SOUTHBOUND													
		SB Left	150' (6 veh)	0'					0'			1'			3'
		SB Thru/Right	150' (6 veh)	290'	354'	364'	385'	476'	589'	465'	656'	700'	378'	422'	519'
3 Southeast Parkway / Shadow Green Drive	Signal	EASTBOUND													
		EB Left	100' (4 veh)	83'	100'	208'	146'	227'	286'	77'	111'	128'	97'	132'	155'
		EB Thru	200' (8 veh)	41'	68'	73'	44'	70'	77'	31'	47'	48'	35'	48'	52'
		EB Right	75' (3 veh)	47'	66'	70'	53'	99'	186'	49'	57'	121'	53'	82'	157'
		WESTBOUND													
		WB Left	125' (5 veh)	85'	86'	41'	110'	114'	135'	62'	65'	75'	38'	38'	44'
		WB Thru/Right	800' (12 veh)	79'	86'	98'	112'	176'	262'	87'	164'	225'	66'	78'	87'
		NORTHBOUND													
		NB Left	150' (6 veh)	41'			20'			27'	82'	164'	87'	150'	161'
		NB Thru/Right	150' (6 veh)	612'	1030'	1360'	188'	382'	1131'	292'	349'	434'	602'	666'	956'
		SOUTHBOUND													
		SB Left	120' (4 veh)	9'	20'	101'			39'	22'					61'
		SB Thru	580' (23 veh)				252'	273'	288'	250'	402'	447'	209'	283'	244'
		SB Right	100' (4 veh)							3'	25'	27'	29'		
4 Alpha Drive	Stop	WESTBOUND													
		WB Left/Thru/Right	200' (8 veh)	26'	43'	167'	116'	192'	457'	84'	158'	999'	37'	55'	174'
		SOUTHBOUND													
		SB Left	75' (3 veh)	5'	9'	26'	6'	8'	22'	3'	4'	7'	3'	8'	7'
5 Century Court	Signal	EASTBOUND													
		EB Left	125' (5 veh)	124'	151'	178'	121'	147'	172'	99'	114'	132'	59'	73'	82'
		EB Thru/Right	225' (9 veh)	46'	47'	51'	59'	60'	66'	57'	57'	61'	32'	32'	34'
		WESTBOUND													
		WB Left/Thru/Right	50' (2 veh)	11'	11'	11'	11'	11'	11'	11'	11'	11'	12'	12'	13'
		NORTHBOUND													
		NB Left	75' (3 veh)			55'			93'			22'	6'	6'	6'
		NB Thru/Right	200' (8 veh)	580'	676'	677'	583'	702'	953'	533'	616'	974'	120'	156'	174'
		SOUTHBOUND													
		SB Left	100' (4 veh)	1'	1'	0'			2'	1'	1'	1'			1'
		SB Thru/Right	225' (9 veh)	227'	482'	1111'	821'	1048'	1993'	957'	1204'	1840'	171'	1014'	1990'
6 Beasley Drive / Lumber Drive	Two-Way Stop Control (TWSC)	EASTBOUND													
		EB Left/Thru/Right	325' (13 veh)	16'	19'	9999'	80'	55'	101'	42'	64'	151'	29'	44'	183'
		WESTBOUND													
		WB Left/Thru/Right	200' (8 veh)	5'	4'	15'	35'	68'	104'	26'	52'	82'	23'	49'	9999'
		NORTHBOUND													
		NB Left	75' (3 veh)	9'	10'	18'	9'	11'	32'	4'	5'	13'	3'	4'	10'
		SOUTHBOUND													
		SB Left	25' (1 veh)	1'	2'	5'	5'	7'	19'	3'	3'	11'	4'	9'	17'
		WESTBOUND													
		WB Left	150' (6 veh)	83'	38'	37'	62'	66'	78'	48'	50'	58'	124'	129'	153'
7 Franklin Business Park (North) / Future Werthan Circle	Signal	EB Left	150' (6 veh)	30'	31'	34'	33'	33'	37'	31'	31'	34'	41'	42'	46'
		WB Right	150' (6 veh)	30'	31'	34'	33'	33'	37'	31'	31'	34'	41'	42'	46'
		NORTHBOUND													
		NB Thru/Right	275' (11 veh)	363'	556'	1328'	638'	795'	1325'	696'	817'	1156'	508'	651'	1158'
		SOUTHBOUND													
		SB Left	150' (6 veh)	7'			3'	5'	5'	4'	5'	10'			
		SB Thru	999' (40 veh)	193'	214'	319'	205'	310'	553'	248'	409'	613'	641'	774'	848'
		EASTBOUND													
		EB Left	100' (4 veh)	16'	61'	9999'	0'	18'	78'	3'	10'	21'	0'	20'	75'
		EB Thru/Right	150' (6 veh)	5'	18'	175'	2'	13'	35'	1'	8'	14'	1'	16'	84'
8 Confederate Drive / Werthan Circle	TWSC	WESTBOUND													
		WB Left	100' (4 veh)	17'	32'	117'	15'	26'	81'	5'	7'	17'	5'	10'	37'
		WB Thru/Right	200' (8 veh)	6'	11'	24'	9'	16'	34'	4'	6'	13'	7'	12'	31'
		NORTHBOUND													
		NB Left	100' (4 veh)	5'	8'	13'	0'	4'	5'	0'	3'	4'	0'	5'	7'
		SOUTHBOUND													
		SB Left	100' (4 veh)	7'	9'	22'	7'	9'	21'	1'	1'	2'	4'	5'	11'
		WESTBOUND													
		WB Left/Thru/Right	175' (7 veh)	9'	11'	20'	22'	29'	64'	20'	27'	59'	20'	26'	58'
		SOUTHBOUND													
9 Carr Avenue	Stop	WESTBOUND													
		WB Left/Thru/Right	150' (6 veh)	3'	3'	5'	3'	4'	6'	3'	3'	5'	2'	3'	4'
		SOUTHBOUND													
		SB Left	150' (6 veh)	3'	3'	5'	3'	4'	6'	3'	3'	5'	2'	3'	4'
10 Downs Boulevard	Signal	EASTBOUND													
		EB Left/Thru	350' (14 veh)	104'	107'	119'	101'	105'	120'	118'	114'	132'	108'	113'	135'
		EB Right	850' (14 veh)	107'	111'	274'	92'	96'	104'	95'	99'	107'	101'	149'	412'
		WESTBOUND													
		WB Left/Thru/Right	50' (2 veh)	14'	14'	16'	23'	23'	27'	22'	22'	26'	21'	21'	25'
		NORTHBOUND													
		NB Left	150' (6 veh)	166'	195'	245'	148'	196'	303'	311'	387'	586'	289'	347'	464'
		NB Thru/Right	175' (7 veh)	490'	572'	627'	425'	493'	674'	355'	414'	581'	316'	350'	352'
		SOUTHBOUND													
		SB Left	50' (2 veh)	5'	5'	8'	6'	8'	10'	7'	9'	10'	7'	8'	8'
11 James Avenue	Stop	WESTBOUND													
		WB Left/Thru/Right	125' (5 veh)	7'	9'	15'	8'	10'	16'	8'	9'	14'	9'	11'	17'
		SOUTHBOUND													
		SB Left	200' (8 veh)	0'	0'	1'	1'	1'	1'	1'	1'	1'	1'	1'	2'

Queue Reduction Color Code:

NOTES: (1) No-Build results updated 8/25/2017 to assume consistent signal timings/offsets with 2016 existing conditions. Previous data had assumed improvements to signal timings in future conditions.

(2) Queue length of "9999"

Queue Length for Five-Lane (Traditional) Concept

Cross-Street	Traffic Control Device	Geometry	Storage Length	[AM] Peak Hour		[MD] Peak Hour		[PM] Peak Hour		[SAT] Peak Hour	
				Queue Length (Feet)		Queue Length (Feet)		Queue Length (Feet)		Queue Length (Feet)	
				2021	2041	2021	2041	2021	2041	2021	2041
1 Mack Hatcher Parkway / Hillview Lane	Signal	EASTBOUND (EB)									
		EB Left	150' (6 veh)	10'	11'	44'	52'	29'	26'	27'	30'
		EB Thru	450' (18 veh)	36'	45'	106'	126'	85'	99'	118'	141'
		EB Right	40' (1 veh)	0'	0'	0'	0'	17'	34'	0'	0'
		WESTBOUND (WB)									
		WB Left	640' (25 veh)	108'	129'	75'	89'	178'	198'	82'	97'
		WB Thru	999' (40 veh)	64'	73'	87'	104'	91'	107'	104'	124'
		WB Right	325' (13 veh)	108'	182'	66'	145'	87'	161'	74'	144'
		NORTHBOUND (NB)									
		NB Left	200' (8 veh)	20'	24'	27'	32'	22'	26'	42'	50'
		NB Thru	775' (31 veh)	228'	291'	135'	162'	160'	196'	157'	180'
		NB Right	40' (1 veh)	40'	57'	6'	17'	1'	8'	11'	28'
		SOUTHBOUND (SB)									
		SB Left	800' (12 veh)	153'	175'	100'	114'	116'	127'	91'	140'
		SB Thru	560' (22 veh)	265'	315'	184'	242'	608'	804'	418'	508'
		SB Right	400' (16 veh)	0'	0'	0'	0'	0'	0'	0'	0'
2 Parkway Commons / Cemetery	Signal	EASTBOUND									
		EB Left	175' (7 veh)	102'	120'	228'	308'	175'	242'	188'	244'
		EB Thru/Right	175' (7 veh)	0'	0'	0'	0'	0'	9'	0'	8'
		WESTBOUND									
		WB Left/Thru/Right	250' (10 veh)	10'	10'	35'	39'	10'	10'	17'	18'
		NORTHBOUND									
		NB Left	150' (6 veh)	74'	74'	93'	119'	105'	140'	80'	92'
		NB Thru/Right	150' (6 veh)	95'	125'	234'	274'	275'	315'	254'	291'
		SOUTHBOUND									
		SB Left	150' (6 veh)	1'	1'	3'	3'	0'	1'	2'	2'
		SB Thru/Right	150' (6 veh)	52'	57'	132'	148'	60'	76'	79'	96'
		EASTBOUND									
		EB Left	100' (4 veh)	99'	134'	121'	137'	78'	86'	100'	119'
		EB Thru	200' (8 veh)	48'	52'	47'	52'	35'	37'	40'	43'
		EB Right	75' (3 veh)	48'	48'	82'	124'	50'	80'	76'	121'
3 Southeast Parkway / Shadow Green Drive	Signal	WESTBOUND									
		WB Left	125' (5 veh)	24'	28'	70'	83'	46'	54'	32'	36'
		WB Thru/Right	300' (12 veh)	68'	73'	86'	104'	87'	105'	68'	75'
		NORTHBOUND									
		NB Left	200' (8 veh)	4'	4'	24'	61'	102'	177'	70'	130'
		NB Thru/Right	385' (15 veh)	50'	59'	92'	113'	32'	44'	72'	91'
		SOUTHBOUND									
		SB Left	100' (4 veh)	75'	114'	43'	73'	21'	22'	32'	46'
		SB Thru	580' (23 veh)	147'	205'	143'	193'	113'	176'	101'	117'
		SB Right	100' (4 veh)	0'	0'	0'	0'	1'	1'	7'	7'
4 Alpha Drive	Two-Way Stop Control (TWSC)	EASTBOUND									
		EB Left/Thru/Right	50' (2 veh)	1'	1'	2'	3'	2'	4'	2'	3'
		WESTBOUND									
		WB Left/Thru/Right	200' (8 veh)	11'	16'	43'	74'	34'	60'	16'	28'
		NORTHBOUND									
		NB Left	175' (7 veh)	1'	1'	2'	2'	2'	3'	0'	1'
		SOUTHBOUND									
		SB Left	75' (3 veh)	4'	6'	5'	7'	3'	4'	2'	3'
5 Century Court	Signal	EASTBOUND									
		EB Left	125' (5 veh)	107'	124'	107'	125'	84'	98'	64'	70'
		EB Thru/Right	225' (9 veh)	37'	40'	50'	54'	47'	52'	29'	31'
		WESTBOUND									
		WB Left/Thru/Right	50' (2 veh)	8'	8'	9'	9'	9'	9'	11'	12'
		NORTHBOUND									
		NB Left	75' (3 veh)	23'	47'	37'	66'	8'	15'	4'	8'
		NB Thru/Right	200' (8 veh)	71'	82'	82'	137'	43'	100'	45'	111'
		SOUTHBOUND									
		SB Left	100' (4 veh)	2'	2'	2'	2'	1'	1'	1'	1'
		SB Thru/Right	225' (9 veh)	262'	327'	130'	152'	97'	128'	263'	364'
6 Beasley Drive / Lumber Drive	TWSC	EASTBOUND									
		EB Left/Thru/Right	325' (13 veh)	11'	15'	18'	24'	23'	31'	14'	25'
		WESTBOUND									
		WB Left/Thru/Right	200' (8 veh)	2'	3'	20'	32'	14'	24'	13'	20'
		NORTHBOUND									
		NB Left	25' (1 veh)	10'	14'	10'	14'	4'	6'	3'	4'
		SOUTHBOUND									
		SB Left	200' (8 veh)	1'	2'	5'	8'	3'	4'	4'	5'
7 Franklin Business Park (North) / Future Werthan Circle	Signal	WESTBOUND									
		WB Left	150' (6 veh)	26'	28'	48'	55'	37'	43'	108'	128'
		WB Right	150' (6 veh)	25'	26'	27'	30'	25'	28'	37'	41'
		NORTHBOUND									
		NB Left	275' (11 veh)	72'	170'	235'	338'	118'	255'	197'	193'
		NB Thru/Right									
		SOUTHBOUND									
		SB Left	150' (6 veh)	9'	9'	4'	4'	9'	12'	23'	33'
		SB Thru	998' (40 veh)	90'	91'	70'	76'	50'	69'	121'	137'
8 Confederate Drive / Werthan Circle	Signal	EASTBOUND									
		EB Left	100' (4 veh)	62'	68'	36'	36'	35'	37'	39'	39'
		EB Thru/Right	150' (6 veh)	37'	39'	35'	36'	26'	27'	34'	34'
		WESTBOUND									
		WB Left	100' (4 veh)	47'	53'	52'	60'	28'	31'	26'	30'
		WB Thru/Right	200' (8 veh)	29'	31'	36'	39'	25'	26'	31'	32'
		NORTHBOUND									
		NB Left	100' (4 veh)	0'	0'			3'	3'		
		NB Thru/Right	115' (4 veh)	8'	12'	78'	95'	84'	96'	101'	128'
		SOUTHBOUND									
		SB Left	100' (4 veh)	6'	10'	5'	10'				
		SB Thru/Right	325' (13 veh)	154'	224'	116'	193'	116'	155'	185'	223'
9 Carr Avenue	Stop	WESTBOUND									
		WB Left/Thru/Right	175' (7 veh)	6'	8'	13'	20'	13'	20'	11'	15'
		SOUTHBOUND									
		SB Left	150' (6 veh)	3'	4'	4'	5'	3'	5'	2'	4'
10 Downs Boulevard	Signal	EASTBOUND									
		EB Left	150' (6 veh)	85'	100'	76'	89'	86'	102'	100'	119'
		EB Thru	350' (14 veh)	8'	10'	5'	5'	8'	10'	5'	5'
		EB Right	350' (14 veh)	139'	134'	115'	218'	163'	269'	279'	308'
		WESTBOUND									
		WB Left	100' (4 veh)	8'	10'	9'	11'	12'	13'	14'	16'
		WB Thru/Right	250' (10 veh)	9'	10'	14'	18'	13'	15'	11'	14'
		NORTHBOUND									
		NB Left	300' (12 veh)	94'	102'	134'	195'	103'	159'	145'	184'
		NB Thru/Right	175' (7 veh)	32'	38'	106'	169'	75'	98'	108'	166'
		SOUTHBOUND									
		SB Left	150' (6 veh)	5'	7'	5'	7'	6'	7'	7'	8'
		SB Thru	450' (18 veh)	292'	416'	346'	482'	377'	551'	570'	529'
		SB Right	300' (12 veh)	24'	28'	21'	23'	24'	27'	27'	29'
11 James Avenue	Stop	WESTBOUND									
		WB Right	125' (5 veh)	9'	15'	9'	15'	8'	12'	10'	16'

Queue Length for Five-Lane (Access Management) Concept

Cross-Street	Traffic Control Device	Geometry	Storage Length	[AM] Peak Hour		[MD] Peak Hour		[PM] Peak Hour		[SAT] Peak Hour	
				Queue Length (Feet)		Queue Length (Feet)		Queue Length (Feet)		Queue Length (Feet)	
				2021	2041	2021	2041	2021	2041	2021	2041
1 Mack Hatcher Parkway / Hillview Lane	Signal	EASTBOUND (EB)									
		EB Left	150' (6 veh)	10'	11'	44'	52'	25'	26'	27'	30'
		EB Thru	430' (18 veh)	38'	43'	106'	126'	85'	99'	118'	141'
		EB Right	40' (1 veh)	0'	0'	0'	0'	17'	54'	0'	0'
		WESTBOUND (WB)									
		WB Left	640' (25 veh)	109'	129'	75'	89'	178'	198'	82'	97'
		WB Thru	999' (40 veh)	64'	73'	87'	104'	91'	107'	104'	124'
		WB Right	325' (13 veh)	109'	182'	66'	145'	87'	161'	74'	144'
		NORTHBOUND (NB)									
		NB Left	200' (8 veh)	20'	24'	27'	32'	22'	26'	42'	50'
		NB Thru	775' (31 veh)	228'	291'	185'	162'	160'	196'	157'	190'
		NB Right	40' (1 veh)	40'	57'	6'	17'	1'	8'	11'	23'
		SOUTHBOUND (SB)									
		SB Left	800' (12 veh)	155'	175'	100'	114'	116'	127'	91'	140'
		SB Thru	560' (22 veh)	285'	314'	184'	248'	603'	804'	418'	509'
		SB Right	400' (16 veh)	0'	0'	0'	0'	0'	0'	0'	0'
2 Parkway Commons / Cemetery	Signal	EASTBOUND									
		EB Left	175' (7 veh)	102'	120'	229'	308'	175'	242'	183'	244'
		EB Thru/Right	175' (7 veh)	0'	0'	0'	0'	0'	0'	0'	8'
		WESTBOUND									
		WB Left/Thru/Right	250' (10 veh)	10'	10'	35'	39'	10'	10'	17'	18'
		NORTHBOUND									
		NB Left	150' (6 veh)	74'	74'	93'	119'	105'	140'	80'	92'
		NB Thru/Right	150' (6 veh)	95'	125'	234'	274'	275'	315'	254'	291'
		SOUTHBOUND									
		SB Left	150' (6 veh)	1'	1'	5'	3'	0'	1'	2'	2'
		SB Thru/Right	150' (6 veh)	52'	57'	132'	448'	60'	78'	79'	98'
3 Southeast Parkway / Shadow Green Drive	Signal	EASTBOUND									
		EB Left	100' (4 veh)	99'	124'	121'	137'	78'	86'	105'	119'
		EB Thru	200' (8 veh)	48'	52'	47'	52'	35'	37'	40'	43'
		EB Right	75' (3 veh)	46'	46'	82'	124'	50'	80'	78'	121'
		WESTBOUND									
		WB Left	125' (5 veh)	24'	28'	70'	83'	46'	54'	32'	34'
		WB Thru/Right	300' (12 veh)	66'	73'	86'	104'	87'	109'	68'	75'
		NORTHBOUND									
		NB Left	200' (8 veh)	4'	4'	24'	61'	102'	177'	70'	130'
		NB Thru/Right	885' (15 veh)	50'	59'	92'	118'	32'	44'	72'	91'
		SOUTHBOUND									
		SB Left	100' (4 veh)	75'	114'	43'	73'	21'	21'	34'	46'
		SB Thru	580' (23 veh)	147'	205'	145'	193'	112'	174'	116'	177'
		SB Right	100' (4 veh)	0'	0'	0'	0'	1'	1'	7'	7'
4 Alpha Drive	Two-Way Stop Control (TWSC)	EASTBOUND									
		EB Left/Thru/Right	50' (2 veh)	1'	1'	2'	3'	2'	4'	2'	5'
		WESTBOUND									
		WB Left/Thru/Right	200' (8 veh)	11'	18'	48'	74'	34'	60'	16'	23'
		NORTHBOUND									
		NB Left	175' (7 veh)	1'	1'	2'	2'	2'	3'	0'	1'
		SOUTHBOUND									
		SB Left	75' (3 veh)	4'	6'	5'	7'	3'	4'	2'	3'
5 Century Court	Signal	EASTBOUND									
		EB Left	125' (5 veh)	107'	124'	107'	125'	84'	88'	64'	70'
		EB Thru/Right	225' (9 veh)	37'	40'	50'	54'	47'	52'	29'	31'
		WESTBOUND									
		WB Left/Thru/Right	50' (2 veh)	8'	8'	9'	9'	9'	9'	11'	12'
		NORTHBOUND									
		NB Left	75' (3 veh)	25'	47'	37'	66'	8'	15'	4'	8'
		NB Thru/Right	200' (8 veh)	71'	82'	82'	137'	43'	100'	45'	111'
		SOUTHBOUND									
		SB Left	100' (4 veh)			1'	2'	1'	1'	0'	1'
		SB Thru/Right	225' (9 veh)	261'	325'	181'	153'	99'	130'	253'	374'
6 Beasley Drive / Lumber Drive	TWSC	EASTBOUND									
		EB Left/Thru/Right	325' (13 veh)	11'	15'	18'	24'	22'	25'	14'	25'
		WESTBOUND									
		WB Left/Thru/Right	200' (8 veh)	2'	5'	20'	32'	14'	23'	19'	20'
		NORTHBOUND									
		NB Left	25' (1 veh)	10'	14'	10'	14'	4'	6'	3'	4'
		SOUTHBOUND									
		SB Left	200' (8 veh)	1'	2'	5'	8'	3'	4'	4'	5'
7 Franklin Business Park (North) / Future Werthan Circle	Signal	WESTBOUND									
		WB Left	150' (6 veh)	38'	37'	35'	62'	45'	52'	132'	157'
		WB Right	150' (6 veh)	25'	28'	27'	29'	25'	28'	37'	41'
		NORTHBOUND									
		NB Thru/Right	275' (11 veh)	72'	170'	252'	359'	118'	260'	157'	193'
		SOUTHBOUND									
		SB Left	150' (6 veh)	9'	9'	6'	6'	10'	14'	24'	65'
		SB Thru	999' (40 veh)	89'	91'	70'	76'	49'	68'	121'	136'
		EASTBOUND									
		EB Left	100' (4 veh)	62'	68'	36'	36'	35'	37'	99'	89'
		EB Thru/Right	150' (6 veh)	37'	38'	35'	36'	26'	27'	34'	34'
		WESTBOUND									
		WB Left	100' (4 veh)	47'	55'	52'	60'	28'	31'	26'	30'
		WB Thru/Right	200' (8 veh)	29'	31'	36'	39'	25'	26'	31'	32'
		NORTHBOUND									
		NB Left	100' (4 veh)	0'	0'	8'	8'			8'	8'
		NB Thru/Right	115' (4 veh)	8'	12'	78'	106'	84'	100'	101'	128'
		SOUTHBOUND									
		SB Left	100' (4 veh)	6'	10'	5'	10'				
		SB Thru/Right	925' (13 veh)	134'	224'	116'	195'	116'	155'	195'	223'
9 Carr Avenue	Stop	WESTBOUND									
		WB Left/Thru/Right	175' (7 veh)	6'	8'	13'	20'	13'	20'	11'	15'
		SOUTHBOUND									
		SB Left	150' (6 veh)	5'	4'	4'	5'	5'	5'	2'	4'
10 Downs Boulevard	Signal	EASTBOUND									
		EB Left	150' (6 veh)	85'	100'	76'	89'	86'	102'	100'	119'
		EB Thru	350' (14 veh)	8'	10'	5'	5'	8'	10'	5'	5'
		EB Right	350' (14 veh)	192'	334'	113'	218'	163'	269'	279'	508'
		WESTBOUND									
		WB Left	100' (4 veh)	8'	10'	9'	11'	12'	13'	14'	16'
		WB Thru/Right	250' (10 veh)	9'	10'	14'	18'	13'	15'	11'	14'
		NORTHBOUND									
		NB Left	300' (12 veh)	94'	102'	137'	195'	104'	199'	144'	184'
		NB Thru/Right	175' (7 veh)	32'	38'	106'	569'	78'	100'	109'	366'
		SOUTHBOUND									
		SB Left	150' (6 veh)	5'	7'	5'	7'	6'	7'	7'	8'
		SB Thru	450' (18 veh)	292'	416'	346'	482'	377'	551'	370'	529'
		SB Right	300' (12 veh)	24'	28'	21'	25'	24'	27'	27'	29'
11 James Avenue	Stop	WESTBOUND									
		WB Left/Thru/Right	125' (5 veh)	5'	9'	6'	9'	4'	7'	6'	9'

Queue Length for Roundabout Concept

Cross-Street	Traffic Control Device	Geometry	Storage Length	[AM] Peak Hour		[MD] Peak Hour		[PM] Peak Hour		[SAT] Peak Hour	
				Queue Length (Feet)		Queue Length (Feet)		Queue Length (Feet)		Queue Length (Feet)	
				2021	2041	2021	2041	2021	2041	2021	2041
1 Mack Hatcher Parkway / Hillview Lane	Signal	EASTBOUND (EB)									
		EB Left	150' (6 veh)	10'	11'	43'	51'	23'	26'	27'	30'
		EB Thru	450' (18 veh)	38'	43'	104'	123'	85'	101'	121'	144'
		EB Right	40' (1 veh)	0'	0'	0'	0'	17'	34'	6'	19'
		WESTBOUND (WB)									
		WB Left	640' (25 veh)	108'	128'	73'	87'	178'	215'	83'	99'
		WB Thru	999' (40 veh)	64'	73'	86'	102'	91'	108'	106'	126'
		WB Right	325' (13 veh)	106'	176'	61'	134'	87'	163'	82'	155'
		NORTHBOUND (NB)									
		NB Left	200' (8 veh)	20'	24'	26'	31'	22'	25'	43'	53'
		NB Thru	999' (40 veh)	223'	282'	131'	158'	160'	192'	162'	196'
		NB Right	40' (1 veh)	40'	56'	5'	16'	1'	8'	12'	24'
		SOUTHBOUND (SB)									
		SB Left	300' (12 veh)	130'	153'	152'	182'	114'	135'	158'	189'
		SB Thru	560' (22 veh)	182'	222'	267'	333'	547'	784'	358'	513'
		SB Right	400' (16 veh)	0'	0'	0'	0'	0'	0'	0'	0'
2 Parkway Commons / Cemetery	Roundabout	EASTBOUND									
		EB Left/Thru/U-Turn	175' (7 veh)	13'	18'	47'	78'	35'	57'	33'	52'
		EB Right	175' (7 veh)	4'	6'	13'	19'	19'	30'	16'	23'
		WESTBOUND									
		WB Left/Thru/Right/U-Turn	250' (10 veh)	1'	1'	5'	7'	1'	1'	2'	2'
		NORTHBOUND									
		NB Left/Thru/U-Turn	150' (6 veh)	70'	99'	53'	79'	55'	74'	52'	71'
		NB Thru/Right	150' (6 veh)	70'	99'	53'	79'	55'	74'	52'	71'
		SOUTHBOUND									
		SB Left/Thru/U-Turn	150' (6 veh)	40'	52'	63'	86'	73'	104'	60'	83'
		SB Thru/Right	150' (6 veh)	40'	52'	63'	86'	73'	104'	60'	83'
		3 Southeast Parkway / Shadow Green Drive	Roundabout	EASTBOUND							
EB Left/Thru/U-Turn	200' (8 veh)			27'	37'	55'	93'	23'	36'	32'	49'
EB Right	200' (8 veh)			29'	41'	54'	87'	32'	50'	48'	77'
WESTBOUND											
WB Left/Thru/U-Turn	125' (5 veh)			8'	12'	32'	53'	16'	24'	11'	16'
WB Right	300' (12 veh)			31'	52'	34'	56'	25'	40'	18'	28'
NORTHBOUND											
NB Left/Thru/U-Turn	450' (18 veh)			102'	185'	89'	153'	65'	95'	71'	119'
NB Thru/Right	450' (18 veh)			102'	185'	89'	153'	65'	95'	71'	119'
SOUTHBOUND											
SB Left/Thru/U-Turn	450' (18 veh)			48'	66'	96'	175'	123'	230'	92'	164'
SB Thru/Right	450' (18 veh)			48'	66'	96'	175'	123'	230'	92'	164'
4 Alpha Drive	Two-Way Stop Control (TWSC)	EASTBOUND									
		EB Left/Thru/Right	50' (2 veh)	0'	0'	2'	3'	2'	3'	1'	2'
		WESTBOUND									
5 Century Court	Roundabout	WB Left/Thru/Right	150' (6 veh)	13'	21'	46'	87'	27'	44'	19'	31'
		EASTBOUND									
		EB Left/Thru/U-Turn	125' (5 veh)	17'	23'	24'	39'	17'	27'	10'	14'
		EB Right	225' (9 veh)	13'	19'	29'	47'	23'	38'	8'	12'
		WESTBOUND									
		WB Left/Thru/Right/U-Turn	50' (2 veh)	1'	1'	1'	1'	1'	1'	1'	1'
		NORTHBOUND									
		NB Left/Thru/U-Turn	200' (8 veh)	90'	146'	98'	187'	71'	101'	71'	101'
		NB Thru/Right	200' (8 veh)	90'	146'	98'	187'	71'	101'	71'	101'
		SOUTHBOUND									
		SB Left/Thru/U-Turn	275' (11 veh)	56'	76'	79'	141'	85'	128'	82'	120'
		SB Thru/Right	275' (11 veh)	56'	76'	79'	141'	85'	128'	82'	120'
6 Beasley Drive / Lumber Drive	TWSC	EASTBOUND									
		EB Right	325' (13 veh)	16'	24'	30'	52'	39'	70'	29'	50'
		WESTBOUND									
7 Franklin Business Park (North) / Future Werthan Circle	Roundabout	WB Right	200' (8 veh)	2'	3'	16'	25'	9'	14'	12'	18'
		WESTBOUND									
		WB Left/Thru/Right/U-Turn	150' (6 veh)	9'	13'	15'	22'	9'	13'	39'	66'
		NORTHBOUND									
		NB Thru/U-Turn	275' (11')	73'	103'	70'	97'	59'	75'	63'	88'
8 Confederate Drive / Werthan Circle	Roundabout	NB Thru/Right	275' (11')	73'	103'	70'	97'	59'	75'	63'	88'
		SOUTHBOUND									
		SB Left/Thru/U-Turn	999' (40 veh)	50'	69'	55'	76'	60'	83'	71'	102'
		SB Thru	999' (40 veh)	50'	69'	55'	76'	60'	83'	71'	102'
		EASTBOUND									
9 Carr Avenue	Stop	EB Left/Thru/Right/U-Turn	150' (6 veh)	17'	23'	11'	14'	7'	9'	11'	11'
		WESTBOUND									
		WB Left/Thru/Right/U-Turn	200' (8 veh)	14'	21'	19'	30'	9'	12'	9'	13'
		NORTHBOUND									
		NB Left/Thru/U-Turn	115' (4 veh)	71'	100'	66'	90'	54'	73'	65'	90'
10 Downs Boulevard	Signal	NB Thru/Right	115' (4 veh)	71'	100'	66'	90'	54'	73'	65'	90'
		SOUTHBOUND									
		SB Left/Thru/U-Turn	325' (13 veh)	56'	76'	54'	74'	59'	80'	66'	71'
		SB Thru/Right	325' (13 veh)	56'	76'	54'	74'	59'	80'	66'	71'
		WESTBOUND									
11 James Avenue	Roundabout	WB Right	175' (7 veh)	2'	3'	6'	9'	5'	7'	6'	9'
		EASTBOUND									
		EB Left	150' (6 veh)	82'	94'	76'	88'	83'	96'	100'	116'
		EB Thru	150' (6 veh)	7'	9'	5'	5'	7'	9'	5'	5'
		EB Right	350' (14 veh)	203'	237'	101'	191'	152'	257'	283'	517'
		WESTBOUND									
		WB Left	80' (3 veh)	7'	9'	9'	11'	11'	12'	13'	16'
		WB Thru/Right	80' (3 veh)	8'	10'	14'	17'	12'	14'	11'	14'
		NORTHBOUND									
		NB Left	900' (36 veh)	100'	106'	138'	167'	175'	252'	182'	227'
		NB Thru/Right	900' (36 veh)	192'	287'	176'	264'	150'	217'	198'	283'
		SOUTHBOUND									
SB Left	150' (6 veh)	6'	9'	5'	7'	5'	7'	7'	8'		
SB Thru	450' (18 veh)	332'	547'	327'	433'	359'	480'	377'	541'		
SB Right	300' (12 veh)	27'	36'	20'	23'	23'	25'	27'	29'		