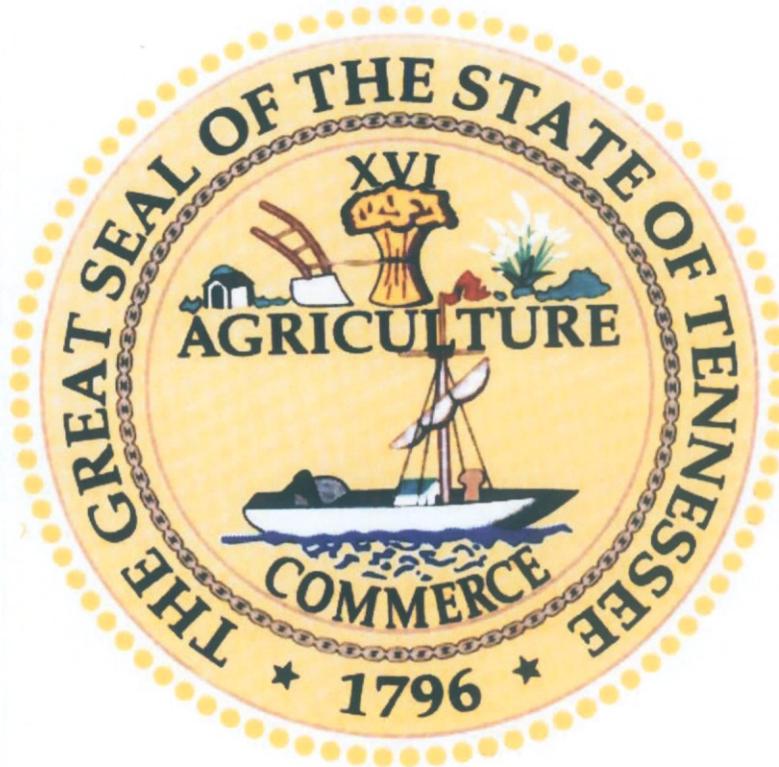


TRANSPORTATION PLANNING REPORT

State Route 6 (Columbia Avenue)
From Mack Hatcher Parkway To Downs Boulevard
CITY OF FRANKLIN, WILLIAMSON COUNTY
PIN 113474.00



PREPARED BY
FISCHBACH TRANSPORTATION GROUP, INC.
AND SULLIVAN ENGINEERING, INC

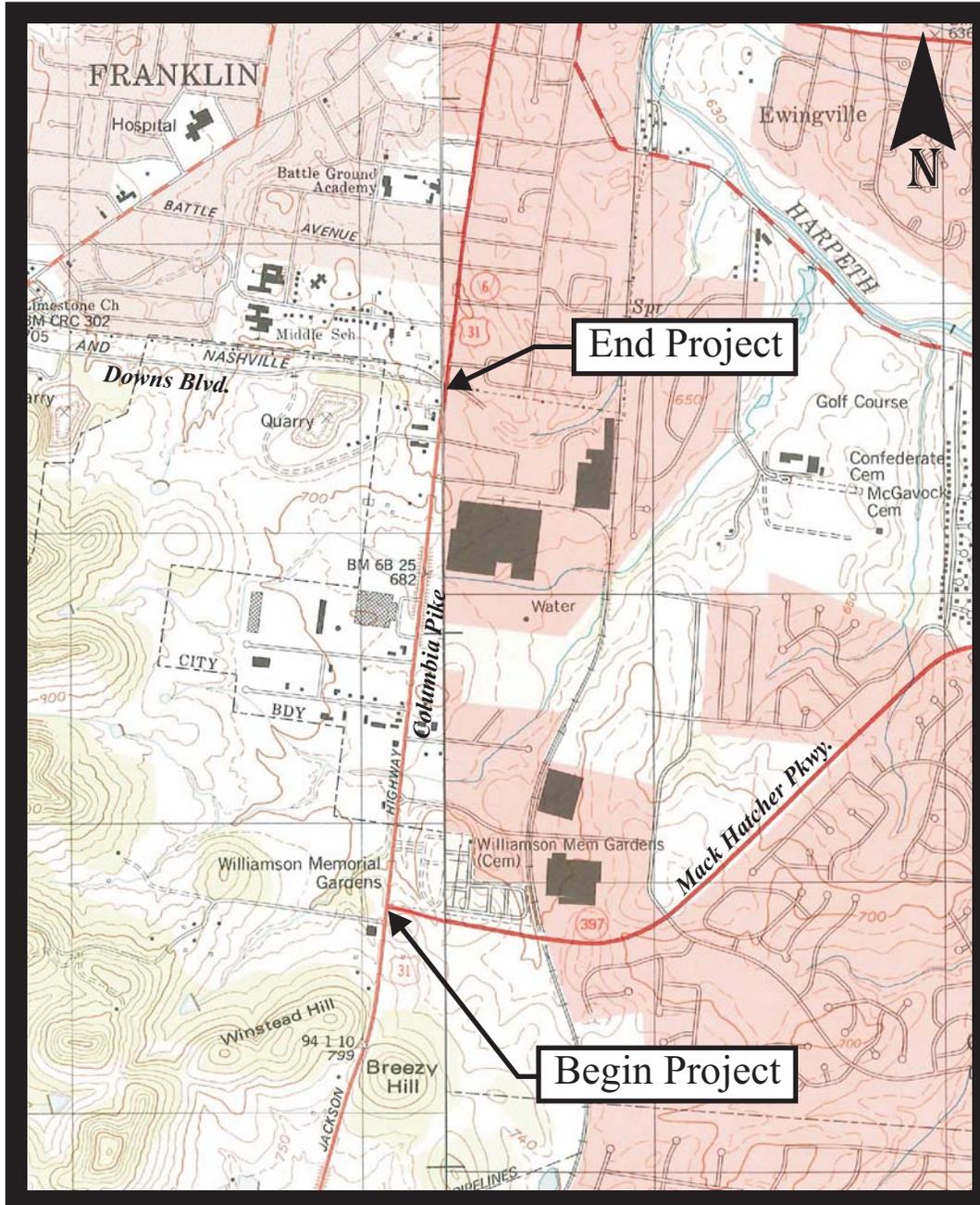
FOR THE CITY OF FRANKLIN
IN COOPERATION WITH THE TENNESSEE DEPARTMENT OF
TRANSPORTATION AND THE NASHVILLE METROPOLITAN
PLANNING ORGANIZATION

| Recommended by: | Signature | DATE |
|--|-----------|----------|
| CHIEF OF ENVIRONMENT AND PLANNING | | 11/17/10 |
| TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION | | 11-15-10 |
| TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION | | 11/9/10 |

This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.

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LOCATION MAP

SCALE: 1"=2000'

1. INTRODUCTION AND BACKGROUND INFORMATION

1.1 Introduction

The purpose of this study is to determine the need for and feasibility of improving the safety and operational capacity of State Route 6 (U.S. Highway 31, Columbia Avenue) from Mack Hatcher Parkway to Downs Boulevard in the City of Franklin, Tennessee.

This report examines a No-Build option that maintains the three-lane cross-section on Columbia Avenue, as well as a Build option that includes widening Columbia Avenue to include two through lanes in each direction with a median-divided section on some roadway segments and dedicated turn lanes at key locations. In addition, the potential effectiveness of several alternative improvements to the Columbia Avenue corridor are discussed.

For the purposes of this study, Year 2012 and Year 2032 traffic projections were developed for the following two scenarios:

1. With the existing roadway network
2. With the planned extension of Mack Hatcher Parkway west of Columbia Avenue

Then, the traffic volumes for each of these network scenarios were applied to both No-Build conditions (Columbia Avenue remains a three-lane facility) and Build conditions (Columbia Avenue is widened to include two travel lanes in each direction, plus dedicated turn lanes at key locations). Capacity analyses were conducted for each of the infrastructure scenarios, and the results of these analyses were used to identify necessary improvements.

The projected traffic volumes, capacity analyses, and potential improvements were discussed during a meeting on August 10, 2007, with representatives from the City of Franklin, the Tennessee Department of Transportation (TDOT), and Fischbach Transportation Group, Inc. Minutes from the meeting are included in the supplemental materials. Also, a public meeting was held at Franklin City Hall on January 23, 2008, in order to discuss the Build conditions and solicit comments. Comment sheets from the meeting are included in the supplemental materials.

In June 2007, a *Tier 2 – Detailed Analysis* was prepared by TDOT and Long Engineering for the Nashville Metropolitan Planning Organization (MPO) for the segment of Columbia Avenue from Mack Hatcher Parkway to Downs Boulevard. Specifically, the summary of the *Tier 2 – Detailed Analysis* states that congestion management strategies, “...may significantly reduce future congestion levels. However, there remains a need for additional capacity based on existing and future traffic volumes. Franklin’s [Major Thoroughfare Plan Update] proposes a multi-lane section with provisions for pedestrians and bicycles. These enhancements, when combined with various CMS toolbox strategies, will increase corridor traffic capacity and reduce congestion, travel time, and delay.”

It is important to note that the widening and improvement of State Route 6 (U.S. Highway 31, Columbia Avenue) is included in the MPO’s Long Range Transportation Plan. Specifically, the

improvement of this facility to three-to-five lanes from Mack Hatcher Parkway to Downs Boulevard is included in the MPO's Long Range Transportation Plan as Project 6027

No environmental survey has been conducted as part of this study. However, a detailed environmental study will need to be performed in conjunction with further advanced planning and design efforts for this improvement.

1.2 Project Study Area

The City of Franklin is located in the center of Williamson County, approximately 20 miles south of Nashville, Tennessee. Columbia Avenue, between Mack Hatcher Parkway and Downs Boulevard, is located immediately south of downtown Franklin.

Williamson County, which is part of the five-county Nashville Metropolitan Planning Organization (MPO), includes approximately 584 square miles and has a population of approximately 164,000 people. The City of Franklin is the county seat, as well as its most populous city with a population of approximately 59,000 persons.

According to the Williamson County Economic Development Office, the population of Williamson County grew 56.3% from 1990 to 2000 and is expected to increase 13.6% between 2007 and 2012. The labor force of Williamson County is approximately 93,500 persons, and the unemployment rate is less than 3%. According to the Nashville Area Metropolitan Planning Organization (MPO), 38% of employees from Williamson County commute to Nashville.

Columbia Avenue is one of the City of Franklin's oldest and most-established arterial corridors. The segment between Mack Hatcher Parkway and Downs Boulevard provides access to downtown Franklin but also provides access to significant commercial and industrial development, as well as the Williamson County Jail, Williamson County Juvenile Court, and Williamson County Rock Quarry. With the future construction of several recently-proposed developments on Columbia Avenue, the land along both sides of the corridor will be substantially built-out.

Several utilities are located within the study area. The utility service providers include:

- City of Franklin Water, Sewer, and Communication Fiber
- AT&T (Telephone)
- Comcast (Television and Internet)
- Atmos Energy (Gas)
- Middle Tennessee Electric Membership Corporation (Electric)

In order to accomplish the improvements identified under Build conditions, these utilities will likely have to be moved or placed underground. However, it is not anticipated that any new utilities will need to be provided.

1.3 Existing Transportation Conditions

In general, the Columbia Avenue corridor travels in a north-south direction between the Cities of Columbia, Spring Hill, and Franklin. The Major Thoroughfare Plan that has been prepared for the City of Franklin classifies this facility as an arterial roadway with a future five-lane cross-section. Currently, the Columbia Avenue corridor includes a three-lane cross-section from Mack Hatcher Parkway to Downs Boulevard. Posted speed limits of 30 mph and 40 mph are found on this portion of Columbia Avenue.

It is important to note that TDOT and the City of Franklin are currently planning an extension of Mack Hatcher Parkway from its existing terminus at Columbia Avenue westward to State Route 96 and Hillsboro Road (State Route 6). This extension, which is included in the City of Franklin's Major Thoroughfare Plan, will improve the vehicular mobility within the City of Franklin. The planned extension of Mack Hatcher Parkway will be constructed with two travel lanes in each direction, separated by a raised grass median.

Currently, the existing eastern half of Mack Hatcher Parkway, including the portion that intersects Columbia Avenue, includes one travel lane in each direction, as well as a depressed grass median. However, TDOT and the City of Franklin are plan to improve this existing facility to include two travel lanes in each direction, separated by a raised grass median.

Recent steady residential and commercial growth has occurred in the City of Franklin, and this growth has placed increasing traffic demands on the roadway infrastructure along the Columbia Avenue corridor. Since 2001, the efforts to address these issues are as follows:

2001

In 2001, the City of Franklin contracted with Fischbach Transportation Group, Inc. and Sullivan Engineering, Inc. to complete an Advance Planning Report for State Route 6 (U.S. Highway 31, Columbia Avenue) from Mack Hatcher Parkway (State Route 397) to Cleburne Street. On October 5, 2001, a field review was conducted and attended by representatives of Fischbach Transportation Group, Inc., Sullivan Engineering, Inc., the City of Franklin, and TDOT.

March 13, 2002

Fischbach Transportation Group, Inc. submitted a draft Advance Planning Report to the City of Franklin Engineering Department for review and approval.

March 20, 2002

A public meeting was held by the City of Franklin Engineering Department. Subsequently, the City of Franklin Board of Mayor and Aldermen voted to withhold the study from consideration by the TDOT, primarily because of concerns about the project's impact on historic properties between Downs Boulevard and Cleburne Street.

July 27, 2004

A letter from State Senator Jim Bryson and State Representative Glen Casada was submitted to Mr. Paul Degges at TDOT, requesting a re-examination of the need to improve State Route 6 (U.S. Highway 31, Columbia Avenue) to a five-lane facility between Mack Hatcher Parkway and Fairground Street.

August 10, 2004

Mr. Degges issued a responding letter to State Senator Bryson and State Representative Casada, indicating that a Feasibility Study would be initiated in order to evaluate their request.

August 17, 2004

Mr. David Parker, Director of the Franklin Engineering Department, submitted copies of the discontinued 2002 Draft Advance Planning Report and the public meeting transcript to Mr. Bill Hart at TDOT.

December 2004

The Franklin Board of Mayor and Alderman approved an agreement with Fischbach Transportation Group, Inc. to update and complete the Advance Planning Report for State Route 6 (U.S. Highway 31, Columbia Avenue).

December 2004

The Franklin Board of Mayor and Alderman approved an agreement with Fischbach Transportation Group, Inc. to update and complete the Advance Planning Report for State Route 6 (U.S. Highway 31, Columbia Avenue).

January 2005 – April 2006

Fischbach Transportation Group, Inc. worked with the City of Franklin in the development of cross-sections and access management strategies that would complement the City's goals for vehicle capacity, traffic flow, and aesthetics on the Columbia Avenue corridor.

May 10, 2006

A partially-updated copy of the Advance Planning Report for State Route 6 (U.S. Highway 31, Columbia Avenue) from Mack Hatcher Parkway to Downs Boulevard was submitted to TDOT's Project Planning Division by Fischbach Transportation Group, Inc.

August 23, 2006

A meeting was held by representatives from TDOT and Fischbach Transportation Group, Inc. in order to discuss TDOT's new requirements for Transportation Planning Reports (TPRs) and updated traffic data coordination with the Nashville MPO.

March 28, 2007

TDOT's Project Planning Division initiated a contract with Long Engineering for the preparation of a TIER 2 Study for State Route 6 (U.S. Highway 31, Columbia Avenue) from Mack Hatcher Parkway to Downs Boulevard.

June 21, 2007

The draft TIER 2 Study was submitted to TDOT.

June 25, 2007

The draft TIER 2 Study was submitted to the Nashville Area MPO for approval.

August 10, 2007

A field review was conducted and attended by representatives of Fischbach Transportation Group, Inc., Sullivan Engineering, Inc., the City of Franklin, TDOT, and the Federal Highway Administration (FHWA).

2. PURPOSE AND NEED

2.1 Purpose

The purpose of widening Columbia Avenue is to provide the capacity necessary to accommodate the projected traffic volumes on this facility. In particular, as residential development continues to increase south and west of Columbia Avenue, this roadway segment will become an increasingly-important link to commercial developments, as well as employment centers on Columbia Avenue and in downtown Franklin.

2.2 Need

Currently, only Columbia Avenue, Lewisburg Pike, and Interstate 65 provide north-south access between southern Williamson County and downtown Franklin. Columbia Avenue and Lewisburg Pike each include only one through lane in each direction, even though both of these facilities provide direct access to the core of Franklin. Because of the existing and future development on Columbia Avenue, between Mack Hatcher Parkway and Downs Boulevard, this facility in particular will require additional capacity in order to accommodate the travel demand.

2.3 Goals

The goals of an improvement to Columbia Avenue are to:

- Relieve traffic congestion on Columbia Avenue
- Improve access to downtown Franklin from areas south of the core
- Increase accessibility to existing and future development on Columbia Avenue

3. PROJECTED TRAFFIC VOLUMES

The following projected traffic Design Hourly Volumes (DHVs) and Average Annual Daily Traffic Volumes (AADTs) are included in the [Appendix](#):

- 2012 DHVs for the Existing Network (no extension of Mack Hatcher Parkway)
- 2032 DHVs for the Existing Network (no extension of Mack Hatcher Parkway)
- 2012 DHVs for the Future Network (with extension of Mack Hatcher Parkway)
- 2032 DHVs for the Future Network (with extension of Mack Hatcher Parkway)
- 2012 and 2032 AADTs for the Existing Network (no extension of Mack Hatcher Parkway)
- 2012 and 2032 AADTs for the Future Network (with extension of Mack Hatcher Parkway)

Specifically, projected traffic volumes were developed for the following intersections:

1. Columbia Avenue and Downs Boulevard
2. Columbia Avenue and Confederate Drive (existing) / Longview Circle (future)
3. Columbia Avenue and Beasley Drive
4. Columbia Avenue and Century Court
5. Columbia Avenue and Southeast Parkway (existing) / Through the Green access (future)
6. Columbia Avenue and Mack Hatcher Parkway

For the existing roadway network (no extension of Mack Hatcher Parkway), the Year 2012 DHVs were developed by collecting Year 2007 ground counts and then adding the traffic that will be generated by the following three projects that have been approved or proposed for construction on Columbia Avenue:

1. Construction of the Longview Office Park with retail and office land uses (on the west side of Columbia Avenue, opposite Confederate Drive)
2. Redevelopment of the Lasko industrial complex as the Franklin Business Park, with office and warehouse land uses (on the east side of Columbia Avenue, south of Confederate Drive)
3. Redevelopment of the Through the Green property with residential, retail, and office land uses (on the west side of Columbia Avenue, opposite Southeast Parkway).

Then, the Year 2032 DHVs for the existing roadway network (no extension of Mack Hatcher Parkway) were developed by increasing the Year 2012 DHVs by 30% in order to account for an average annual growth rate of approximately 1.5%.

For the future roadway network (with extension of Mack Hatcher Parkway), the Year 2012 DHVs were developed by reassigning the Year 2012 DHVs for the existing network in order to account for the change in travel patterns that will occur with the extension of Mack Hatcher Parkway. Specifically, this reassignment was completed with guidance from the transportation model that was developed by the Tennessee Department of Transportation (TDOT) and the Metropolitan Planning Organization (MPO).

Then, the Year 2032 DHVs for the future roadway network (with extension of Mack Hatcher Parkway) were developed by increasing the Year 2012 DHVs by 30% in order to account for an average annual growth rate of approximately 1.5%.

Average Annual Daily Traffic Volumes (AADTs) were established by averaging the AM and PM peak hour volumes and multiplying by 10, based on the assumption that peak hour volumes account for approximately 10% of daily traffic volumes.

The traffic volumes for each of these network scenarios were applied to both No-Build conditions (Columbia Avenue remains a three-lane facility) and Build conditions (Columbia Avenue is widened to include two travel lanes in each direction, plus dedicated turn lanes at key locations).

It is important to note that the projected traffic volumes were reviewed and approved by TDOT's Project Planning Division. The following page includes the letter of approval from TDOT.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION
SUITE 1000, JAMES K. POLK BUILDING
505 Deaderick Street
NASHVILLE, TENNESSEE 37243-0344

Gerald F. Nicely
Commissioner

Phil Bredesen
Governor

July 26, 2007

Mrs. Gillian Parton
Fischbach Transportation Group, Inc.
3326 Aspen Grove Dr., Suite 130
Franklin Tn. 37067

Subject : Columbia Pike Transportation Planning Report (TPR)
Franklin, Williamson County

Dear Gillian,

We have reviewed the traffic projections and after our discussion with Steve Allen yesterday the traffic figures have our approval for your use in the study for the city of Franklin. If I can be of further assistance, please contact me.

Sincerely,

Tony Armstrong
Transportation Manager 1

cc: file

4. OPTIONS ANALYZED

4.1 No Build

Using the peak hour traffic volumes projected for No Build conditions, capacity analyses were conducted for the intersections within the study area. Specifically, in order to identify peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the Highway Capacity Manual 2000 (HCM 2000). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation used to describe how well an intersection operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. Typically, LOS D is considered to be the minimum acceptable LOS. However, the City of Franklin considers LOS C to be the minimum acceptable LOS. The following tables present the descriptions of LOS for signalized intersections, unsignalized intersections, and arterial corridors.

The analyses conducted for the existing roadway network are based on the assumption that all existing laneage and traffic control within the study area will be maintained and no improvements will be provided. The analyses conducted for the future roadway network are based on the assumption that a second eastbound through lane and a second westbound through lane will be provided on Mack Hatcher Parkway at the intersection with Columbia Avenue. For all other intersections, it was assumed that the existing laneage and traffic control within the study area will be maintained and no improvements will be provided. The results of the capacity analyses for the peak hour traffic volumes are shown in the following tables, and the supplemental materials include the capacity analyses worksheets.

The capacity analyses indicate, with the existing roadway network (no extension of Mack Hatcher Parkway), all of the signalized intersections studied will operate poorly during both peak hours in Years 2012 and 2032. Also, the eastbound and westbound turning movements at the intersection of Columbia Avenue and Beasley Drive will operate poorly during both peak hours in Years 2012 and 2032. Finally, as a whole, the corridor will operate poorly in both directions in both peak hours in Years 2012 and 2032.

With the planned extension of Mack Hatcher Parkway, the through volumes on Columbia Avenue will be reduced, and so the capacity analyses indicate that vehicle delays and queues will be reduced in Years 2012 and 2032, compared to the existing roadway network. However, these reductions are not significant enough to provide adequate operations at all of the intersections studied through the Year 2032.

DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

| Level of Service | Description | Average Control Delay per Vehicle (sec) |
|-------------------------|--|--|
| A | Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay. | ≤ 10 |
| B | Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay. | > 10 and ≤ 20 |
| C | Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping. | > 20 and ≤ 35 |
| D | Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop. | > 35 and ≤ 55 |
| E | Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios. | > 55 and ≤ 80 |
| F | Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels. | > 80 |

Source: Highway Capacity Manual 2000 (HCM2000)

DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

| Level of Service | Description | Average Control Delay (sec/veh) |
|-------------------------|--------------------|--|
| A | Minimal delay | ≤ 10 |
| B | Brief delay | > 10 and ≤ 15 |
| C | Average delay | > 15 and ≤ 25 |
| D | Significant delay | > 25 and ≤ 35 |
| E | Long delay | > 35 and ≤ 50 |
| F | Extreme delay | > 50 |

Source: Highway Capacity Manual 2000 (HCM 2000)

DESCRIPTIONS OF LOS FOR ARTERIAL CORRIDORS

| Level of Service | Description | Average Travel Speed * (mph) |
|-------------------------|--------------------|---|
| A | Minimal delay | > 35 |
| B | Brief delay | > 28 and < 2355 |
| C | Average delay | > 22 and < 28 |
| D | Significant delay | > 17 and < 22 |
| E | Long delay | > 13 and < 17 |
| F | Extreme delay | ≤ 13 |

Source: Highway Capacity Manual 2000 (HCM 2000)

* For Class II urban streets with a free-flow speed of 35-45 mph.

YEAR 2012 PEAK HOUR LEVELS OF SERVICE

NO-BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|
| | | LEVEL OF SERVICE | 95 TH % - ILE QUEUE | LEVEL OF SERVICE | 95 TH % - ILE QUEUE |
| Columbia Avenue and Downs Boulevard (existing laneage and traffic control) | Northbound Left Turns | LOS F 456 sec/veh | 75 veh | LOS F 264 sec/veh | 125 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 10 veh | | 12 veh |
| | Eastbound Right Turns | | 163 veh | | 79 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (existing laneage plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS F 131 sec/veh | 6 veh | LOS F 127 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 15 veh |
| | Westbound Left Turns | | 1 veh | | 5 veh |
| Columbia Avenue and Beasley Drive (existing laneage and traffic control) | Northbound Left Turns | LOS B | 1 veh | LOS B | 1 veh |
| | Southbound Left Turns | LOS B | 1 veh | LOS B | 1 veh |
| | Eastbound Left Turns | LOS F | 4 veh | LOS F | 12 veh |
| | Eastbound Thru/Right Turns | LOS D | 1 veh | LOS F | 3 veh |
| | Westbound Left/Thru/Right Turns | LOS F | 8 veh | LOS F | 12 veh |

YEAR 2012 PEAK HOUR LEVELS OF SERVICE, CONT.**NO-BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---------------------------------|----------------------|-----------------------------|----------------------|------------------|-----------------------------|-------------|
| | | LEVEL OF SERVICE | 95 TH FILE QUEUE | %-ILE QUEUE | LEVEL OF SERVICE | 95 TH FILE QUEUE | %-ILE QUEUE |
| Columbia Avenue and Century Court (existing laneage and traffic control) | Northbound Left Turns | LOS F 82 sec/veh | 3 veh | LOS F 183 sec/veh | 2 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns / Thrus | | 4 veh | | 30 veh | | |
| | Eastbound Right Turns | | 18 veh | | 13 veh | | |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh | | |
| Columbia Avenue and Southeast Parkway/ Through the Green (existing laneage plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS F 630 sec/veh | 2 veh | LOS F 456 sec/veh | 6 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns | | 3 veh | | 8 veh | | |
| | Westbound Left Turns | | 3 veh | | 6 veh | | |
| Columbia Avenue and Mack Hatcher Parkway (existing laneage and traffic control) | Northbound Left Turns | LOS F 414 sec/veh | 2 veh | LOS F 373 sec/veh | 3 veh | | |
| | Southbound Left Turns | | 18 veh | | 63 veh | | |
| | Eastbound Left Turns | | 2 veh | | 4 veh | | |
| | Eastbound Thru/Right Turns | | 10 veh | | 43 veh | | |
| | Westbound Left Turns | | 11 veh | | 75 veh | | |
| | Westbound Throughs | | 9 veh | | 19 veh | | |
| | Westbound Right Turns | | 248 veh | | 43 veh | | |

YEAR 2012 ARTERIAL LEVELS OF SERVICE**NO-BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS F | LOS C |
| | Between Century Court and Confederate Drive | LOS B | LOS F |
| | Between Confederate Drive and Downs Boulevard | LOS B | LOS B |
| | OVERALL | LOS D | LOS F |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS F | LOS B |
| | Between Confederate Drive and Century Court | LOS A | LOS E |
| | Between Century Court and Southeast Parkway | LOS D | LOS F |
| | OVERALL | LOS F | LOS F |

YEAR 2032 PEAK HOUR LEVELS OF SERVICE

**NO-BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|
| | | LEVEL OF SERVICE | 95 TH % - ILE QUEUE | LEVEL OF SERVICE | 95 TH % - ILE QUEUE |
| Columbia Avenue and Downs Boulevard (existing laneage and traffic control) | Northbound Left Turns | LOS F 984 sec/veh | 138 veh | LOS F 724 sec/veh | 270 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 14 veh | | 24 veh |
| | Eastbound Right Turns | | 335 veh | | 177 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (existing laneage plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS F 265 sec/veh | 6 veh | LOS F 259 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 15 veh |
| | Westbound Left Turns | | 1 veh | | 5 veh |
| Columbia Avenue and Beasley Drive (existing laneage and traffic control) | Northbound Left Turns | LOS B | 1 veh | LOS C | 1 veh |
| | Southbound Left Turns | LOS C | 1 veh | LOS C | 1 veh |
| | Eastbound Left Turns | LOS F | 6 veh | LOS F | 15 veh |
| | Eastbound Thru/Right Turns | LOS F | 3 veh | LOS F | 8 veh |
| | Westbound Left/Thru/Right Turns | LOS F | 14 veh | LOS F | undefined |

YEAR 2032 PEAK HOUR LEVELS OF SERVICE, CONT.

**NO-BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---------------------------------|----------------------|----------------------------|-----------------------|------------------|----------------------------|----|
| | | LEVEL OF SERVICE | 95 TH ILE QUEUE | %- | LEVEL OF SERVICE | 95 TH ILE QUEUE | %- |
| Columbia Avenue and Century Court (existing laneage and traffic control) | Northbound Left Turns | LOS F 330 sec/veh | 22 veh | LOS F 424 sec/veh | 2 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns / Thrus | | 4 veh | | 47 veh | | |
| | Eastbound Right Turns | | 18 veh | | 29 veh | | |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh | | |
| Columbia Avenue and Southeast Parkway/ Through the Green (existing laneage plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS F 964 sec/veh | 2 veh | LOS F 881 sec/veh | 6 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns | | 3 veh | | 8 veh | | |
| | Westbound Left Turns | | 3 veh | | 6 veh | | |
| Columbia Avenue and Mack Hatcher Parkway (existing laneage and traffic control) | Northbound Left Turns | LOS F 847 sec/veh | 3 veh | LOS F 999+ sec/veh | 9 veh | | |
| | Southbound Left Turns | | 37 veh | | 479 veh | | |
| | Eastbound Left Turns | | 2 veh | | 3 veh | | |
| | Eastbound Thru/Right Turns | | 10 veh | | 15 veh | | |
| | Westbound Left Turns | | 153 veh | | 300 veh | | |
| | Westbound Throughs | | 9 veh | | 12 veh | | |
| | Westbound Right Turns | | 481 veh | | 331 veh | | |

YEAR 2032 ARTERIAL LEVELS OF SERVICE**NO-BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS F | LOS F |
| | Between Century Court and Confederate Drive | LOS F | LOS F |
| | Between Confederate Drive and Downs Boulevard | LOS C | LOS F |
| | OVERALL | LOS D | LOS F |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS F | LOS F |
| | Between Confederate Drive and Century Court | LOS D | LOS F |
| | Between Century Court and Southeast Parkway | LOS F | LOS F |
| | OVERALL | LOS F | LOS F |

YEAR 2012 PEAK HOUR LEVELS OF SERVICE

**NO-BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|--------------------------------|---------------------|--------------------------------|
| | | LEVEL OF SERVICE | 95 TH % - ILE QUEUE | LEVEL OF SERVICE | 95 TH % - ILE QUEUE |
| Columbia Avenue and Downs Boulevard (existing laneage and traffic control) | Northbound Left Turns | LOS F 175 sec/veh | 4 veh | LOS D 36 sec/veh | 20 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 11 veh | | 15 veh |
| | Eastbound Right Turns | | 80 veh | | 9 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (existing laneage plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS F 83 sec/veh | 6 veh | LOS E 74 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 11 veh |
| | Westbound Left Turns | | 1 veh | | 4 veh |
| Columbia Avenue and Beasley Drive (existing laneage and traffic control) | Northbound Left Turns | LOS A | 1 veh | LOS B | 1 veh |
| | Southbound Left Turns | LOS B | 1 veh | LOS A | 1 veh |
| | Eastbound Left Turns | LOS F | 1 veh | LOS F | 5 veh |
| | Eastbound Thru/Right Turns | LOS C | 1 veh | LOS D | 1 veh |
| | Westbound Left/Thru/Right Turns | LOS F | 2 veh | LOS F | 4 veh |

YEAR 2012 PEAK HOUR LEVELS OF SERVICE, CONT.**NO-BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---------------------------------|----------------------|-----------------------------|----------------------|------------------|-----------------------------|-------------|
| | | LEVEL OF SERVICE | 95 TH MILE QUEUE | %-ILE QUEUE | LEVEL OF SERVICE | 95 TH MILE QUEUE | %-ILE QUEUE |
| Columbia Avenue and Century Court (existing laneage and traffic control) | Northbound Left Turns | LOS B 11 sec/veh | 3 veh | LOS C 24 sec/veh | 2 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns / Thrus | | 4 veh | | 9 veh | | |
| | Eastbound Right Turns | | 7 veh | | 8 veh | | |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh | | |
| Columbia Avenue and Southeast Parkway/ Through the Green (existing laneage plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS F 289 sec/veh | 2 veh | LOS F 162 sec/veh | 6 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns | | 3 veh | | 8 veh | | |
| | Westbound Left Turns | | 3 veh | | 6 veh | | |
| Columbia Avenue and Mack Hatcher Parkway (with second eastbound and westbound through lanes) | Northbound Left Turns | LOS E 61 sec/veh | 17 veh | LOS F 168 sec/veh | 12 veh | | |
| | Southbound Left Turns | | 13 veh | | 35 veh | | |
| | Eastbound Left Turns | | 20 veh | | 7 veh | | |
| | Eastbound Thru/Right Turns | | 15 veh | | 26 veh | | |
| | Westbound Left Turns | | 8 veh | | 35 veh | | |
| | Westbound Throughs | | 8 veh | | 8 veh | | |
| | Westbound Right Turns | | 41 veh | | 18 veh | | |

YEAR 2012 ARTERIAL LEVELS OF SERVICE**NO-BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS C | LOS A |
| | Between Century Court and Confederate Drive | LOS B | LOS F |
| | Between Confederate Drive and Downs Boulevard | LOS B | LOS A |
| | OVERALL | LOS B | LOS F |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS F | LOS B |
| | Between Confederate Drive and Century Court | LOS A | LOS C |
| | Between Century Court and Southeast Parkway | LOS D | LOS F |
| | OVERALL | LOS D | LOS D |

YEAR 2032 PEAK HOUR LEVELS OF SERVICE

NO-BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK (WITH MACK HATCHER PARKWAY EXTENSION)

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|
| | | LEVEL OF SERVICE | 95 TH % - ILE QUEUE | LEVEL OF SERVICE | 95 TH % - ILE QUEUE |
| Columbia Avenue and Downs Boulevard (existing laneage and traffic control) | Northbound Left Turns | LOS F 588 sec/veh | 5 veh | LOS F 232 sec/veh | 106 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 14 veh | | 51 veh |
| | Eastbound Right Turns | | 197 veh | | 17 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (existing laneage plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS F 183 sec/veh | 6 veh | LOS F 168 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 15 veh |
| | Westbound Left Turns | | 1 veh | | 5 veh |
| Columbia Avenue and Beasley Drive (existing laneage and traffic control) | Northbound Left Turns | LOS B | 1 veh | LOS B | 1 veh |
| | Southbound Left Turns | LOS B | 1 veh | LOS B | 1 veh |
| | Eastbound Left Turns | LOS F | 3 veh | LOS F | 12 veh |
| | Eastbound Thru/Right Turns | LOS D | 1 veh | LOS E | 2 veh |
| | Westbound Left/Thru/Right Turns | LOS F | 8 veh | LOS F | 12 veh |

YEAR 2032 PEAK HOUR LEVELS OF SERVICE, CONT.**NO-BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---------------------------------|----------------------|-----------------------------|----------------------|------------------|-----------------------------|-------------|
| | | LEVEL OF SERVICE | 95 TH FILE QUEUE | %-ILE QUEUE | LEVEL OF SERVICE | 95 TH FILE QUEUE | %-ILE QUEUE |
| Columbia Avenue and Century Court (existing laneage and traffic control) | Northbound Left Turns | LOS C 23 sec/veh | 5 veh | LOS E 72 sec/veh | 2 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns / Thrus | | 4 veh | | 31 veh | | |
| | Eastbound Right Turns | | 8 veh | | 13 veh | | |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh | | |
| Columbia Avenue and Southeast Parkway/ Through the Green (existing laneage plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS F 405 sec/veh | 2 veh | LOS F 310 sec/veh | 6 veh | | |
| | Southbound Left Turns | | 1 veh | | 1 veh | | |
| | Eastbound Left Turns | | 3 veh | | 8 veh | | |
| | Westbound Left Turns | | 3 veh | | 6 veh | | |
| Columbia Avenue and Mack Hatcher Parkway (with second eastbound and westbound through lanes) | Northbound Left Turns | LOS F 503 sec/veh | 173 veh | LOS F 671 sec/veh | 15 veh | | |
| | Southbound Left Turns | | 21 veh | | 43 veh | | |
| | Eastbound Left Turns | | 14 veh | | 8 veh | | |
| | Eastbound Thru/Right Turns | | 131 veh | | 140 veh | | |
| | Westbound Left Turns | | 167 veh | | 245 veh | | |
| | Westbound Throughs | | 13 veh | | 22 veh | | |
| | Westbound Right Turns | | 40 veh | | 28 veh | | |

YEAR 2032 ARTERIAL LEVELS OF SERVICE**NO-BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS C | LOS C |
| | Between Century Court and Confederate Drive | LOS B | LOS F |
| | Between Confederate Drive and Downs Boulevard | LOS B | LOS B |
| | OVERALL | LOS B | LOS F |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS F | LOS B |
| | Between Confederate Drive and Century Court | LOS B | LOS C |
| | Between Century Court and Southeast Parkway | LOS E | LOS F |
| | OVERALL | LOS F | LOS E |

4.2 Build

Based on the projected operations of the Columbia Avenue corridor between Mack Hatcher Parkway and Downs Boulevard and the existing land uses within the study area, consideration was given to widening this facility to include two travel lanes in each direction. Also, the cross-sections developed include a raised, grassy median from Confederate Drive to Southeast Parkway, with median cuts to allow full operations at the future intersection with Longview Circle (south) and Franklin Business Park and the existing intersection with Century Court. With this improvement, no median would be provided north of Confederate Drive or south of Southeast Parkway.

Also, it is important to note that two options were developed for terminating the second northbound through lane at the northern terminus of the study area:

Option 1

The new northbound through lane would terminate as a dedicated right turn lane onto James Avenue.

Option 2

The new northbound through lane would terminate as a second left turn lane onto Downs Boulevard. In conjunction with this improvement, Downs Boulevard would be widened for approximately 250 feet to accommodate the second northbound left turn lane.

Based on the projected traffic volumes, the City of Franklin Engineering Department has identified Option 2 as the preferred alternative.

At the southern end of the study area, the new southbound through lane would transition into a dedicated southbound right turn lane. The additional width would be maintained and striped out in order to accommodate any future widening of Columbia Avenue south of Mack Hatcher Parkway.

Typical cross-sections and a functional layout of the Build conditions are included in the [Appendix](#).

In conjunction with the proposed improvement, the existing and planned traffic signal installations at the following locations will need to be rebuilt:

1. Downs Boulevard (existing)
2. Confederate Drive and Longview Circle North (future)
3. Franklin Business Park and Longview Circle South (future)
4. Century Court (existing)
5. Southeast Parkway and Through the Green (future)
6. Parkway Commons Shopping Center (existing)
7. Mack Hatcher Parkway / Hillview Lane (existing)

Each traffic signal installation should include steel poles and mast arms in accordance with City of Franklin standards.

Because of the nature of the land uses and high traffic volumes on Columbia Avenue, an urban cross-section with curb-and-gutter drainage was identified. Also, the curbed cross-section and the median section from Confederate Drive to Southeast Parkway will facilitate the City of Franklin's access management initiatives and limit the driveway cuts to the extent possible. These efforts will reduce the potential for vehicle conflicts and facilitate safe and efficient traffic operations.

Because of right-of-way constraints from Downs Boulevard to Confederate Drive, sidewalks will be provided on the west side from Downs Boulevard to Confederate Drive and, on the east side, from Carr Avenue to Confederate Drive. However, sidewalks will be provided on both sides of the roadway from Confederate Drive to Mack Hatcher Parkway. Because of right-of-way constraints, bicycle lanes will only be provided from Alpha Drive to Mack Hatcher Parkway. However, at Alpha Drive, the bicycle lanes will be able to tie in to the future bicycle facilities included on the City of Franklin's Columbia Avenue Local Street Plan, as described in Section 4.3. It is important to note that the provision of sidewalks and bicycle lanes on both sides of the roadway throughout the entire corridor would require the displacement of existing businesses and right-of-way costs that would make the project fiscally infeasible.

The analyses conducted for the existing roadway network (no extension of Mack Hatcher Parkway) are based on the assumption that, at the intersection with Downs Boulevard, a second northbound left turn lane will be provided and the permissive left turn signal phase will be eliminated. For the intersections with 1.) Confederate Drive and Longview Circle North, 2.) Century Court, and 3.) Southeast Parkway, it was assumed that a second northbound through lane and a second southbound through lane will be provided at each location. The Build conditions include a second northbound through lane north of Mack Hatcher, and so the existing laneage at the intersection with Mack Hatcher Parkway will not change with the proposed improvements. Also, the Build conditions include the construction of a median across Beasley Drive, creating a right-in, right-out intersection. Therefore, capacity analyses for the Build conditions were not conducted for the intersection with Beasley Drive.

The analyses conducted for the future roadway network (with the extension of Mack Hatcher Parkway) are based on the assumption that a second eastbound through lane and a second westbound through lane will be provided on Mack Hatcher Parkway at the intersection with Columbia Avenue. For all other intersections within the future roadway network, it was assumed that no additional improvements will be provided. The results of the capacity analyses for the peak hour traffic volumes are shown in the following tables, and the supplemental materials include the capacity analyses worksheets.

The capacity analyses indicate, with the existing roadway network (no extension of Mack Hatcher Parkway), most of the signalized intersections studied will operate well during both peak hours in Years 2012 and 2032. Also, as a whole, the corridor will generally operate acceptably in both directions in both peak hours in Years 2012 and 2032. Although the intersection with Downs Boulevard and the intersection with Mack Hatcher Parkway will

operate poorly, these results are expected because they mark the termini of the widening project. In each direction, the additional laneage on Columbia Avenue will transition into narrower cross-sections.

With the planned extension of Mack Hatcher Parkway, the through volumes on Columbia Avenue will be reduced, and so the capacity analyses indicate that vehicle delays and queues will be reduced in Years 2012 and 2032, compared to the existing roadway network. Specifically, most of the signalized intersections studied will operate well during both peak hours in Years 2012 and 2032. Also, as a whole, the corridor will operate acceptably in both directions in both peak hours in Years 2012 and 2032. Although the intersection with Downs Boulevard and the intersection with Mack Hatcher Parkway will operate poorly, these results are expected because they mark the termini of the widening project. In each direction, the additional laneage on Columbia Avenue will transition into narrower cross-sections.

YEAR 2012 PEAK HOUR LEVELS OF SERVICE

BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK (WITHOUT MACK HATCHER PARKWAY EXTENSION)

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|------------------------------|----------------------|------------------------------|
| | | LEVEL OF SERVICE | 95 TH %-ILE QUEUE | LEVEL OF SERVICE | 95 TH %-ILE QUEUE |
| Columbia Avenue and Downs Boulevard (with second northbound left turn lane and removal of northbound permissive left turn signal phase) | Northbound Left Turns | LOS F 387 sec/veh | 23 veh | LOS F 121 sec/veh | 38 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 10 veh | | 10 veh |
| | Eastbound Right Turns | | 163 veh | | 25 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (with second northbound and southbound through lanes, plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS B 14 sec/veh | 4 veh | LOS C 23 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 10 veh |
| | Westbound Left Turns | | 1 veh | | 4 veh |
| Columbia Avenue and Century Court (with second northbound and southbound through lanes) | Northbound Left Turns | LOS A 7 sec/veh | 3 veh | LOS B 17 sec/veh | 2 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 4 veh | | 8 veh |
| | Eastbound Right Turns | | 7 veh | | 7 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |

* The intersection of Columbia Avenue and Beasley Drive will be a T-intersection under Build conditions, and so this intersection is not included in this table.

YEAR 2012 PEAK HOUR LEVELS OF SERVICE, CONT.**BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|----------------------------|----------------------|------------------------------|----------------------|------------------------------|
| | | LEVEL OF SERVICE | 95 TH %-ILE QUEUE | LEVEL OF SERVICE | 95 TH %-ILE QUEUE |
| Columbia Avenue and Southeast Parkway/ Through the Green (with second northbound and southbound through lanes plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS B 17 sec/veh | 2 veh | LOS C 27 sec/veh | 6 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 3 veh | | 7 veh |
| | Westbound Left Turns | | 3 veh | | 5 veh |
| Columbia Avenue and Mack Hatcher Parkway (existing laneage and traffic control) | Northbound Left Turns | LOS F 414 sec/veh | 2 veh | LOS F 373 sec/veh | 3 veh |
| | Southbound Left Turns | | 18 veh | | 63 veh |
| | Eastbound Left Turns | | 2 veh | | 4 veh |
| | Eastbound Thru/Right Turns | | 10 veh | | 43 veh |
| | Westbound Left Turns | | 11 veh | | 75 veh |
| | Westbound Throughs | | 9 veh | | 19 veh |
| | Westbound Right Turns | | 248 veh | | 43 veh |

* At the intersection of Columbia Avenue and Mack Hatcher Parkway, the Build conditions include the provision of a second northbound through lane, north of Mack Hatcher Parkway. Therefore, the approach laneage at this intersection will not change, and the results shown are the same as those shown for No-Build conditions.

YEAR 2012 ARTERIAL LEVELS OF SERVICE**BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS C | LOS C |
| | Between Century Court and Confederate Drive | LOS B | LOS C |
| | Between Confederate Drive and Downs Boulevard | LOS B | LOS C |
| | OVERALL | LOS B | LOS C |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS B | LOS B |
| | Between Confederate Drive and Century Court | LOS A | LOS B |
| | Between Century Court and Southeast Parkway | LOS C | LOS E |
| | OVERALL | LOS B | LOS C |

YEAR 2032 PEAK HOUR LEVELS OF SERVICE**BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|
| | | LEVEL OF SERVICE | 95 TH % - ILE QUEUE | LEVEL OF SERVICE | 95 TH % - ILE QUEUE |
| Columbia Avenue and Downs Boulevard (with second northbound left turn lane and removal of northbound permissive left turn signal phase) | Northbound Left Turns | LOS F 885 sec/veh | 48 veh | LOS F 458 sec/veh | 57 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 14 veh | | 24 veh |
| | Eastbound Right Turns | | 335 veh | | 177 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (with second northbound and southbound through lanes, plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS C 26 sec/veh | 6 veh | LOS C 33 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 11 veh |
| | Westbound Left Turns | | 1 veh | | 4 veh |
| Columbia Avenue and Century Court (with second northbound and southbound through lanes) | Northbound Left Turns | LOS A 9 sec/veh | 5 veh | LOS B 13 sec/veh | 2 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 4 veh | | 9 veh |
| | Eastbound Right Turns | | 7 veh | | 8 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |

* The intersection of Columbia Avenue and Beasley Drive will be a T-intersection under Build conditions, and so this intersection is not included in this table.

YEAR 2032 PEAK HOUR LEVELS OF SERVICE, CONT.**BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|----------------------------|----------------------|------------------------------|----------------------|------------------------------|
| | | LEVEL OF SERVICE | 95 TH %-ILE QUEUE | LEVEL OF SERVICE | 95 TH %-ILE QUEUE |
| Columbia Avenue and Southeast Parkway/ Through the Green (with second northbound and southbound through lanes plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS C 26 sec/veh | 2 veh | LOS C 35 sec/veh | 7 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 3 veh | | 7 veh |
| | Westbound Left Turns | | 3 veh | | 5 veh |
| Columbia Avenue and Mack Hatcher Parkway (existing laneage and traffic control) | Northbound Left Turns | LOS F 414 sec/veh | 2 veh | LOS F 373 sec/veh | 3 veh |
| | Southbound Left Turns | | 18 veh | | 63 veh |
| | Eastbound Left Turns | | 2 veh | | 4 veh |
| | Eastbound Thru/Right Turns | | 10 veh | | 43 veh |
| | Westbound Left Turns | | 11 veh | | 75 veh |
| | Westbound Throughs | | 9 veh | | 19 veh |
| | Westbound Right Turns | | 248 veh | | 43 veh |

* At the intersection of Columbia Avenue and Mack Hatcher Parkway, the Build conditions include the provision of a second northbound through lane, north of Mack Hatcher Parkway. Therefore, the approach laneage at this intersection will not change, and the results shown are the same as those shown for No-Build conditions.

YEAR 2032 ARTERIAL LEVELS OF SERVICE

**BUILD CONDITIONS WITH THE EXISTING ROADWAY NETWORK
(WITHOUT MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|------------------|-----------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS C | LOS C |
| | Between Century Court and Confederate Drive | LOS B | LOS D |
| | Between Confederate Drive and Downs Boulevard | LOS C | LOS F |
| | OVERALL | LOS B | LOS E |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS C | LOS B |
| | Between Confederate Drive and Century Court | LOS B | LOS B |
| | Between Century Court and Southeast Parkway | LOS D | LOS E |
| | OVERALL | LOS B | LOS C |

YEAR 2012 PEAK HOUR LEVELS OF SERVICE**BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|---------------------------------|----------------------|-----------------------------|---------------------|-----------------------------|
| | | LEVEL OF SERVICE | 95 TH FILE QUEUE | LEVEL OF SERVICE | 95 TH FILE QUEUE |
| Columbia Avenue and Downs Boulevard (with second northbound left turn lane and removal of northbound permissive left turn signal phase) | Northbound Left Turns | LOS F 176 sec/veh | 4 veh | LOS C 29 sec/veh | 19 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 11 veh | | 13 veh |
| | Eastbound Right Turns | | 80 veh | | 8 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |
| Columbia Avenue and Confederate Drive/ Longview Circle (with second northbound and southbound through lanes, plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS B 12 sec/veh | 3 veh | LOS C 21 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 2 veh | | 10 veh |
| | Westbound Left Turns | | 1 veh | | 4 veh |
| Columbia Avenue and Century Court (with second northbound and southbound through lanes) | Northbound Left Turns | LOS A 7 sec/veh | 3 veh | LOS B 11 sec/veh | 1 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns / Thrus | | 4 veh | | 9 veh |
| | Eastbound Right Turns | | 7 veh | | 8 veh |
| | Westbound Left/Thru/Right Turns | | 1 veh | | 1 veh |

* The intersection of Columbia Avenue and Beasley Drive will be a T-intersection under Build conditions, and so this intersection is not included in this table.

YEAR 2012 PEAK HOUR LEVELS OF SERVICE, CONT.**BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|----------------------------|----------------------|--------------------------------|----------------------|--------------------------------|
| | | LEVEL OF SERVICE | 95 TH % - ILE QUEUE | LEVEL OF SERVICE | 95 TH % - ILE QUEUE |
| Columbia Avenue and Southeast Parkway/ Through the Green (with second northbound and southbound through lanes plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS B 14 sec/veh | 2 veh | LOS C 25 sec/veh | 5 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 3 veh | | 6 veh |
| | Westbound Left Turns | | 3 veh | | 4 veh |
| Columbia Avenue and Mack Hatcher Parkway (with second eastbound and westbound through lanes) | Northbound Left Turns | LOS F 414 sec/veh | 2 veh | LOS F 373 sec/veh | 3 veh |
| | Southbound Left Turns | | 18 veh | | 63 veh |
| | Eastbound Left Turns | | 2 veh | | 4 veh |
| | Eastbound Thru/Right Turns | | 10 veh | | 43 veh |
| | Westbound Left Turns | | 11 veh | | 75 veh |
| | Westbound Throughs | | 9 veh | | 19 veh |
| | Westbound Right Turns | | 248 veh | | 43 veh |

* At the intersection of Columbia Avenue and Mack Hatcher Parkway, the Build conditions include the provision of a second northbound through lane, north of Mack Hatcher Parkway. Therefore, the approach laneage at this intersection will not change, and the results shown are the same as those shown for No-Build conditions.

YEAR 2012 ARTERIAL LEVELS OF SERVICE**BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS C | LOS C |
| | Between Century Court and Confederate Drive | LOS B | LOS B |
| | Between Confederate Drive and Downs Boulevard | LOS B | LOS B |
| | OVERALL | LOS B | LOS B |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS B | LOS B |
| | Between Confederate Drive and Century Court | LOS A | LOS B |
| | Between Century Court and Southeast Parkway | LOS C | LOS E |
| | OVERALL | LOS B | LOS C |

YEAR 2032 PEAK HOUR LEVELS OF SERVICE**BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | | PM PEAK HOUR | | |
|--|---------------------------------|----------------------|-----------------------------|----|---------------------|-----------------------------|----|
| | | LEVEL OF SERVICE | 95 TH FILE QUEUE | %- | LEVEL OF SERVICE | 95 TH FILE QUEUE | %- |
| Columbia Avenue and Downs Boulevard (with second northbound left turn lane and removal of northbound permissive left turn signal phase) | Northbound Left Turns | LOS F 586 sec/veh | 6 veh | | LOS F 91 sec/veh | 27 veh | |
| | Southbound Left Turns | | 1 veh | | | 1 veh | |
| | Eastbound Left Turns / Thrus | | 15 veh | | | 51 veh | |
| | Eastbound Right Turns | | 216 veh | | | 17 veh | |
| | Westbound Left/Thru/Right Turns | | 1 veh | | | 1 veh | |
| Columbia Avenue and Confederate Drive/ Longview Circle (with second northbound and southbound through lanes, plus new Longview Circle and new traffic signal installation) | Northbound Left Turns | LOS B 19 sec/veh | 6 veh | | LOS C 24 sec/veh | 1 veh | |
| | Southbound Left Turns | | 1 veh | | | 1 veh | |
| | Eastbound Left Turns | | 2 veh | | | 10 veh | |
| | Westbound Left Turns | | 1 veh | | | 4 veh | |
| Columbia Avenue and Century Court (with second northbound and southbound through lanes) | Northbound Left Turns | LOS A 7 sec/veh | 3 veh | | LOS B 15 sec/veh | 2 veh | |
| | Southbound Left Turns | | 1 veh | | | 1 veh | |
| | Eastbound Left Turns / Thrus | | 4 veh | | | 8 veh | |
| | Eastbound Right Turns | | 7 veh | | | 7 veh | |
| | Westbound Left/Thru/Right Turns | | 1 veh | | | 1 veh | |

* The intersection of Columbia Avenue and Beasley Drive will be a T-intersection under Build conditions, and so this intersection is not included in this table.

YEAR 2032 PEAK HOUR LEVELS OF SERVICE, CONT.

**BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| INTERSECTION | TURNING MOVEMENT | AM PEAK HOUR | | PM PEAK HOUR | |
|--|----------------------------|----------------------|------------------------------|----------------------|------------------------------|
| | | LEVEL OF SERVICE | 95 TH %-ILE QUEUE | LEVEL OF SERVICE | 95 TH %-ILE QUEUE |
| Columbia Avenue and Southeast Parkway/ Through the Green (with second northbound and southbound through lanes plus new Through the Green access and new traffic signal installation) | Northbound Left Turns | LOS B 15 sec/veh | 2 veh | LOS C 31 sec/veh | 5 veh |
| | Southbound Left Turns | | 1 veh | | 1 veh |
| | Eastbound Left Turns | | 3 veh | | 6 veh |
| | Westbound Left Turns | | 3 veh | | 4 veh |
| Columbia Avenue and Mack Hatcher Parkway (with second eastbound and westbound through lanes) | Northbound Left Turns | LOS F 414 sec/veh | 2 veh | LOS F 373 sec/veh | 3 veh |
| | Southbound Left Turns | | 18 veh | | 63 veh |
| | Eastbound Left Turns | | 2 veh | | 4 veh |
| | Eastbound Thru/Right Turns | | 10 veh | | 43 veh |
| | Westbound Left Turns | | 11 veh | | 75 veh |
| | Westbound Throughs | | 9 veh | | 19 veh |
| | Westbound Right Turns | | 248 veh | | 43 veh |

* At the intersection of Columbia Avenue and Mack Hatcher Parkway, the Build conditions include the provision of a second northbound through lane, north of Mack Hatcher Parkway. Therefore, the approach laneage at this intersection will not change, and the results shown are the same as those shown for No-Build conditions.

YEAR 2032 ARTERIAL LEVELS OF SERVICE

**BUILD CONDITIONS WITH THE FUTURE ROADWAY NETWORK
(WITH MACK HATCHER PARKWAY EXTENSION)**

| DIRECTION | CORRIDOR SEGMENT | LEVEL OF SERVICE | |
|-------------------------------|--|-------------------------|-------------------------|
| | | AM PEAK HOUR | PM PEAK HOUR |
| Northbound Columbia Avenue | Between Southeast Parkway and Century Court | LOS C | LOS D |
| | Between Century Court and Confederate Drive | LOS B | LOS C |
| | Between Confederate Drive and Downs Boulevard | LOS B | LOS B |
| | OVERALL | LOS B | LOS C |
| Southbound Columbia Avenue | Between Downs Boulevard and Confederate Drive | LOS B | LOS B |
| | Between Confederate Drive and Century Court | LOS B | LOS B |
| | Between Century Court and Southeast Parkway | LOS D | LOS E |
| | OVERALL | LOS B | LOS C |

4.3 Columbia Avenue Local Street Plan

In an effort to help address the existing and projected capacity constraints on Columbia Avenue, as well as to improve access and mobility for the land uses along this corridor, the City of Franklin has developed a Local Street Plan, shown on the following page. This plan identifies several alignments for new local streets that would be parallel to Columbia Avenue, and the City of Franklin has required the incorporation of these new rights-of-way into proposed developments. For example, the north-south roadway identified from Beasley Drive to the Parkway Commons is being implemented in part by the City and in part by the developers of the mixed-use project that has been approved for the former Through the Green property. In addition, this project will provide the east-west corridor directly opposite Southeast Parkway and facilitate the future extension of this new corridor to the future extension of Mack Hatcher Parkway.

As previously noted, the Build conditions include the provision of new bicycle lanes from Alpha Drive to Mack Hatcher Parkway. However, at Alpha Drive, the bicycle lanes will be able to tie in to future bicycle facilities on Alpha Drive, Beta Drive, and the future north-south local street identified on the plan.

If implemented, the roadway network identified on the City's Columbia Avenue Local Street Plan will extend the service life of the existing facility, as well as any future widening of Columbia Avenue. However, even with these improvements, the existing three-lane cross-section will not provide adequate capacity for the projected traffic volumes, either with or without the future extension of Mack Hatcher Parkway.

4.4 Signal System Improvements

In an effort to help address the existing and projected capacity constraints on Columbia Avenue, as well as to improve access and mobility for the land uses along this corridor, the City of Franklin has developed a time-based signal coordination system for the existing traffic signals on Columbia Avenue. As new traffic signals are installed and as a fiber communications network is installed on Columbia Avenue, a communications-based signal system should be implemented. Also, video surveillance cameras should be provided so that the existing and future traffic signals on Columbia Avenue can be incorporated into the monitoring procedures that occur at the City of Franklin's Traffic Operations Center (TOC).

If implemented, a thorough communications-based signal system on Columbia Avenue will extend the service life of the existing facility, as well as any future widening of Columbia Avenue. However, even with these improvements, the existing three-lane cross-section will not provide adequate capacity for the projected traffic volumes, either with or without the future extension of Mack Hatcher Parkway.

Columbia Avenue Local Street Plan



1 inch equals 500 feet



This map was created by the city of Franklin's Engineering Department and was compiled from the most authentic information available. The City is not responsible for any errors or omissions contained hereon. All data and material © Copyright 2007, City of Franklin, TN. All rights reserved.

Legend

- Proposed Centerline
- Existing Streets
- Existing Property Lines & Right-of-Way
- Proposed Mack Hatcher Pkwy.

4.5 Reversible Lane

Additional consideration was given to modifying the existing cross-section on Columbia Avenue to provide a reversible through lane within the existing the center turn lane. Reversible lanes are most appropriate where the peak hour traffic is markedly directional in nature. However, with the approval and construction of several large mixed-use projects on this segment of Columbia Avenue, the directional nature of peak hour traffic on this facility will decrease. Also, such a modification would negatively affect all of the existing left turns into the land uses on each side of Columbia Avenue. Specifically, the provision of a reversible through lane within the existing center turn lane would require that all of the existing traffic signals be modified to eliminate the left turn signal phases.

Because a reversible through lane within the existing center turn lane on Columbia Avenue would only facilitate directional peak hour traffic and would be at the expense of protected left turn movements throughout the corridor, the City of Franklin Engineering Department has eliminated this option from consideration for either short-term or long-term implementation.

5. TDOT'S SEVEN GUIDING PRINCIPLES

The Tennessee Department of Transportation (TDOT) has adopted seven guiding principles against which all transportation projects are to be evaluated: system management, mobility, economic growth, safety, community, environmental stewardship, and fiscal responsibility. The options identified for Columbia Avenue, Mack Hatcher Parkway to Downs Boulevard, are evaluated against these guiding principles as follows:

Guiding Principle 1: Preserve and Manage the Existing Transportation System

The existing three-lane cross-section on Columbia Avenue is expected to fail by the Year 2012, whether or not Mack Hatcher Parkway is extended to the west. Also, the implementation of the City of Franklin's Columbia Avenue Local Street Plan and/or signal system improvements will improve mobility and reduce travel times but will not significantly extend the service life of the Columbia Avenue corridor. Finally, the provision of a reversible lane within the existing center turn lane would marginally facilitate through traffic but compromise left turn movements along the corridor. Only the Build conditions, which include widening Columbia Avenue to include two travel lanes in each direction, as well as dedicated turn lanes, will provide adequate capacity, reduce traffic density, and increase flow rate.

Guiding Principle 2: Move a Growing, Diverse, and Active Population

As previously discussed, Williamson County in general and the City of Franklin in particular are growing at dramatic rates. Also, there is limited public transportation available to the existing population. Based on the projected traffic volumes on Columbia Avenue, from Mack Hatcher Parkway to Downs Boulevard, the existing three-lane cross-section will not be adequate to provide safe and efficient traffic operations, whether or not Mack Hatcher Parkway is extended to the west. Only the Build conditions, which include widening Columbia Avenue to include two travel lanes in each direction, as well as dedicated turn lanes, will provide adequate capacity, reduce traffic density, and improve flow rate.

Guiding Principle 3: Support the State's Economy

The City of Franklin is Williamson County's most-populous and fastest-growing jurisdiction. Within the City, Columbia Avenue provides direct access to the vibrant downtown core and serves a variety of commercial and industrial land uses that are owned and operated by both public and private entities. In particular, three large mixed-use projects have been proposed for construction on this portion of Columbia Avenue, and two of these projects have been approved by the City of Franklin. Combined, these two projects will bring nearly 1,000,000 square feet of new commercial and office space, as well as 200 residential units, to the Columbia Avenue corridor. The improvements identified in the Build conditions will improve access to these projects, as well as improve access to downtown Franklin's ample shopping and workforce opportunities. All efforts to support the City's economy and the County's economy will also support the State's economy.

Guiding Principle 4: Maximize Safety and Security

TDOT's June 2007, *Tier 2 – Detailed Analysis* identifies recent crash data and calculates crash rates for the segment of Columbia Avenue from Mack Hatcher Parkway to Downs Boulevard. As stated, the actual crash rate for this segment of Columbia Avenue is more than the statewide average for similar roadways. Also, the actual crash rates is more than the critical crash rate, which defines statistically how the actual rates differs from the statewide average. The ratio of the actual crash rate to the critical crash rate indicates that a safety problem may exist.

The No Build option would likely result in additional vehicle conflicts because of extensive vehicle queues and delays. With a widening of Columbia Avenue and the provision of a median, turning movements will be completed with less vehicle conflict. Also, with the additional travel lanes on Columbia Avenue, fire and police response times will be reduced.

Guiding Principle 5: Build Partnerships for Livable Communities

For the first time in recent history, a residential project has been proposed and approved for construction on Columbia Avenue. Specifically, the residential component of the Through the Green redevelopment project will be integrated with existing and proposed residential and commercial developments in an effort to create a sustainable community. Also, throughout future planning and design efforts for the improvement of Columbia Avenue, from Mack Hatcher Parkway to Downs Boulevard, the City of Franklin and the Tennessee Department of Transportation (TDOT) will continue the public involvement process as mandated by the provisions of the National Environmental Policy Act (NEPA).

Guiding Principle 6: Promote Stewardship of the Environment

The improvements identified with the Build conditions follow the existing alignment of Columbia Avenue. Also, every attempt was made to limit the amount of right-of-way acquisition that would be necessary to accomplish the improvements. Therefore, the environmental impact of the proposed improvements is expected to be minimal. A future environmental assessment will identify specific impacts to an existing waterway and cemetery.

Guiding Principle 7: Promote Financial Responsibility

The cost estimates, as depicted in this report, are offered for comparison purposes and will fluctuate with inflation and any unexpected conditions. It is TDOT's goal to follow a comprehensive transportation planning process, promote coordination among public and private operators of transportation systems, and support efforts to provide stable funding for the public component of the transportation system. This entails exercising financial responsibility in the development and implementation of roadway projects and minimizing costs to the taxpayers. Also, it is important to note that the results of the capacity analyses indicate that the existing and projected congestion on Columbia Avenue will be untenable, and the costs of not improving Columbia Avenue – as levied on motorists, taxpayers, and the City of Franklin – will likely outpace the cost of improving this roadway segment.

6. COST ESTIMATE FOR BUILD CONDITIONS

Cost estimates were prepared for the Build conditions identified. The costs are summarized in the Summary Data Tables and Itemized Cost Estimates provided in this report, and the cost estimate calculations are located in the supplemental materials.

7. SUMMARY

The analyses conducted for the purposes of this study indicate that the No Build option does not address the purpose, needs, or goals discussed in this report. Specifically, a widening of Columbia Avenue is needed to accommodate the projected traffic volumes, whether or not Mack Hatcher Parkway is extended west of Columbia Avenue. Also, the Build option will increase mobility to and from downtown Franklin, as well as address the need for improved access along the Columbia Avenue corridor. These results are consistent with TDOT's June 2007, *Tier 2 – Detailed Analysis* for this corridor.

The Build option is compatible with the City of Franklin's Major Thoroughfare Plan and is estimated to cost \$18,439,000.

CHECKLIST OF DETERMINANTS

If preliminary field reviews indicate the presence of any of the following facilities or ESE categories, place an "X" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

| | |
|--|---|
| Agricultural land usage | |
| Airport (existing or proposed) | |
| Commercial area, shopping center..... | X |
| Floodplains..... | X |
| Forested land..... | |
| Historical, archaeological, cultural, or natural landmark, or Cemeteries..... | X |
| Industrial park, factory..... | X |
| Institutional usages: | |
| 1. School or other educational institution | |
| 2. Church or other religious institution..... | |
| 3. Hospital or other medical facility | X |
| 4. Public building, e.g., fire station..... | X |
| 5. Defense installation..... | |
| Recreational usages | |
| 1. Park or recreational area, State Natural Area | |
| 2. Wildlife refuge or Wildlife Management Area..... | |
| Residential establishment | X |
| Urban area, town, city, or community | X |
| Waterway, lake, pond, river, stream, spring, wetland | X |
| Permits required: | |
| Coast Guard | |
| Section 404 | X |
| Section 10 | |
| TVA Section 26a Review | |
| NPDES..... | X |
| Aquatic Resource Alteration Permit | X |
| Class V Injection Wells Permit..... | |
| Location coordinated with local officials | X |
| Railroad Crossings..... | |
| Hazardous Material Site..... | |
| Other | |

SUMMARY DATA TABLE

| ITEM | EXISTING | PROPOSED |
|---|----------------------|----------------------|
| Functional Class | Urban Minor Arterial | Urban Minor Arterial |
| System | STP | STP |
| Length (Miles) | 1.17 | 1.17 |
| Cross Section (Feet) | See Appendix | See Appendix |
| Columbia Ave. (US 31, SR 6) Year 2012 AADT | See Appendix | See Appendix |
| Columbia Ave. (US 31, SR 6) Year 2032 AADT | See Appendix | See Appendix |
| Columbia Ave. (US 31, SR 6) DHVs | | 10% |
| % Trucks on Columbia Avenue | | 4% |
| Estimated Right-of-Way Acquisition (Acres) | | 8.23 |
| Estimated Right-of-Way Tracts Effected | | 44 |
| Estimated Family Displacements | | 0 |
| Estimated Business Displacements | | 0 |
| Estimated Non-Profit Displacements | | 0 |
| Estimated Right-of-Way Cost | | \$3,639,000 |
| Estimated Utility Cost Reimbursable | | \$0 |
| Estimated Utility Cost Non-Reimbursable | | \$4,090,000 |
| Estimated Construction Cost | | \$9,917,000 |
| Estimated Preliminary Engineering Cost (8%) | | \$793,000 |
| Total Estimated Project Cost | | \$18,439,000 |

DESIGN CRITERIA

ROUTE Columbia Avenue (US 31, SR 6) **ALTERNATE** N/A **SECTION** N/A
REGION 3 **COUNTY** Williamson **PROJECT NO.** N/A
LOCATION: FROM: Mack Hatcher Parkway
TO: Downs Boulevard

Columbia Avenue (US 31, SR 6), 2012 AADT.....See Appendix
Columbia Avenue (US 31, SR 6), 2032 AADT.....See Appendix
Columbia Avenue (US 31, SR 6), Percent Trucks.....4%
DHV10%

FUNCTIONAL CLASSIFICATION.....Urban Minor Arterial
MINIMUM DESIGN SPEED.....40 mph
ACCESS CONTROL.....N/A
MINIMUM CURVE.....10 Deg 00' (S.E. 0.04%)
MAXIMUM GRADE.....8.0%
MINIMUM STOPPING SIGHT DISTANCE.....275' - 325'
SURFACE WIDTH5@12'
NUMBER OF LANES5
USABLE SHOULDER WIDTH6 – 30 C&G
MEDIAN WIDTH12' Turn Lane
MINIMUM RIGHT-OF-WAY.....84'*
SIGNALIZATION.....**

REMARKS:

- * Easement will be required outside Right-of-Way.
- ** Modify existing signal installations and install new traffic signals with mast arm poles per City standards.

COST ESTIMATES**PROJECT:** Columbia Avenue (U.S. Highway 31, State Route 6)**LOCATION: FROM:** Mack Hatcher Parkway**TO:** Downs Boulevard**LENGTH:** 1.17 linear miles**CROSS SECTION:** various (See Appendix)**Right-of-Way**

| | |
|---|--------------------|
| Land, Improvements, and Damages (8.23 ac) | \$3,487,000 |
| Incidentals (44 Tracts) | \$152,000 |
| Relocation Payments (0 Residences, 0 Businesses, 0 Non-Profits) | \$0 |
| Total Right-of-Way Cost..... | \$3,639,000 |

Utility Relocation

| | |
|------------------------------------|--------------------|
| Reimbursable | \$3,990,000 |
| Non-Reimbursable | \$100,000 |
| Total Adjustment Cost | \$4,090,000 |

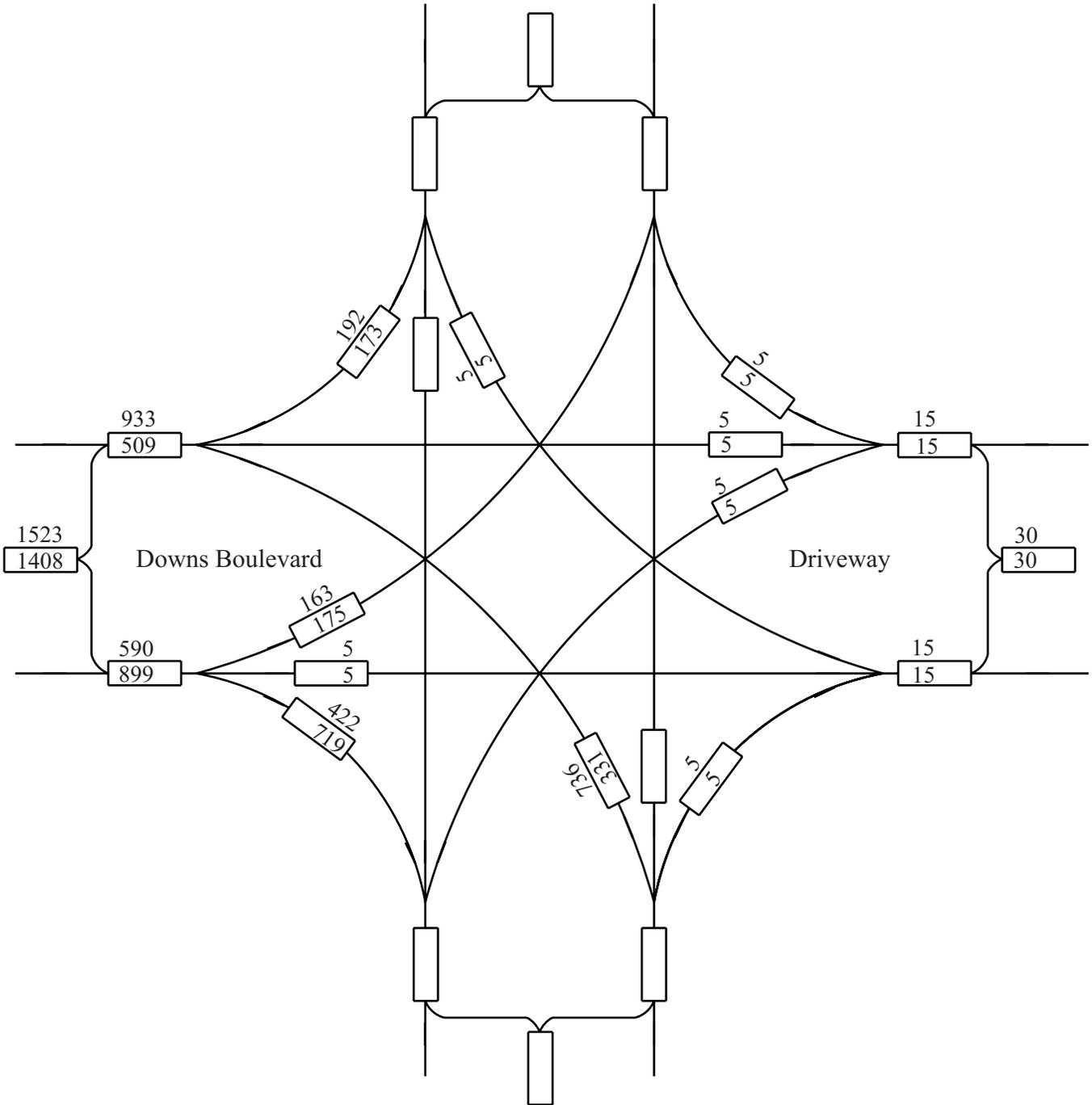
Construction

| | |
|--|--------------------|
| Clear and Grubbing..... | \$64,000 |
| Earthwork..... | \$468,000 |
| Pavement Removal | \$98,000 |
| Drainage (Includes Erosion Control)..... | \$3,018,000 |
| Structures | \$133,000 |
| Railroad Crossing | \$0 |
| Paving | \$2,833,000 |
| Retaining Walls..... | \$167,000 |
| Maintenance of Traffic | \$409,000 |
| Topsoil | \$106,000 |
| Seeding and Sodding | \$183,000 |
| Landscaping | \$0 |
| Signing/Pavement Marking | \$55,000 |
| Signalization and Lighting..... | \$977,000 |
| Fence..... | \$31,000 |
| Guardrail | \$0 |
| Rip Rap or Slope Protection | \$38,000 |
| Walking/Bike Trail | \$0 |
| Mobilization..... | \$351,000 |
| Miscellaneous and Contingency Allowance..... | \$986,000 |
| Total Construction Cost | \$9,917,000 |

Preliminary Engineering (8% of Construction).....**\$793,000****TOTAL SECTION COST \$18,439,000**

APPENDIX – TRAFFIC PROJECTIONS

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

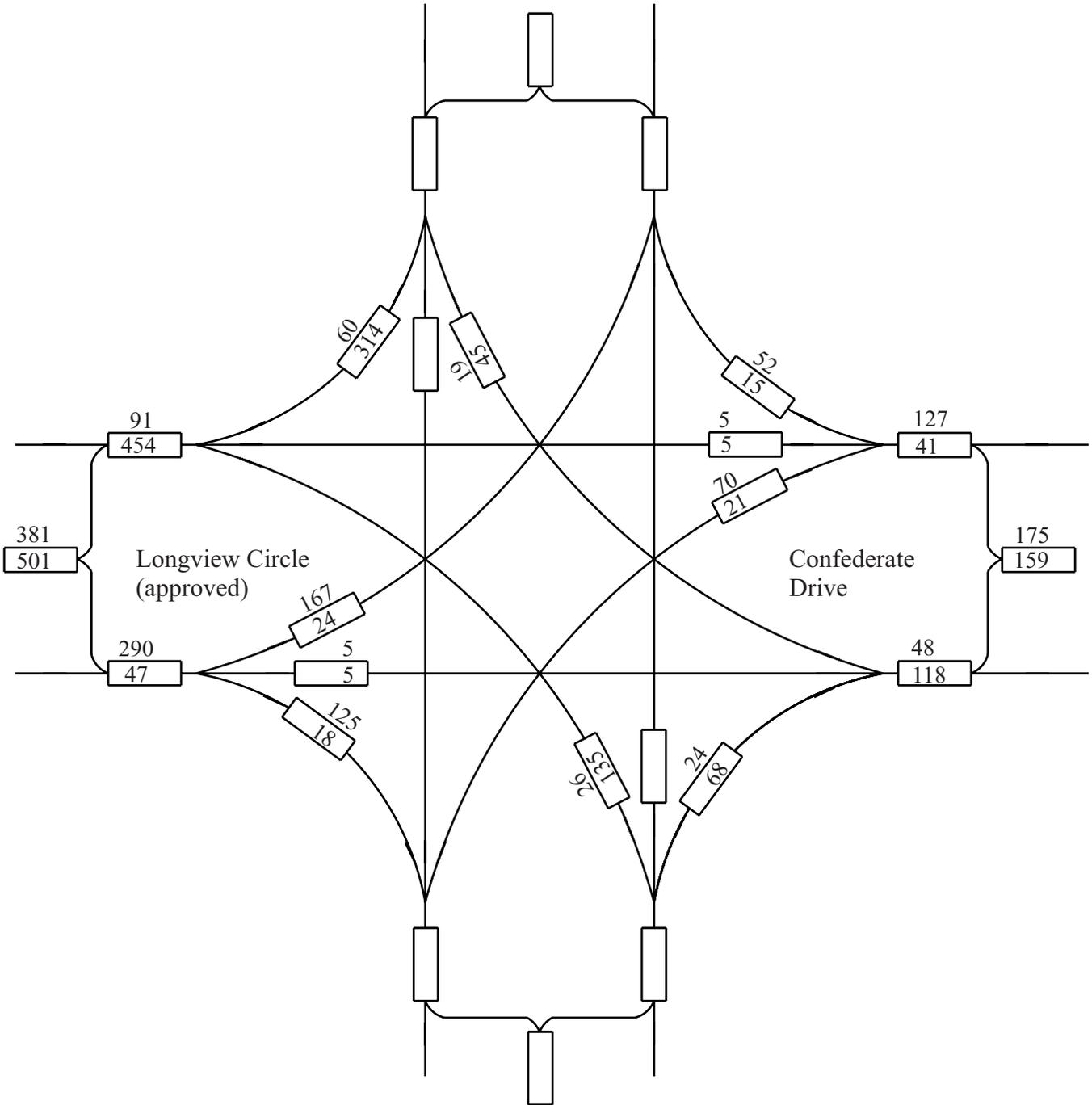


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Downs Boulevard
 Year Year 2012 DHVs
 Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

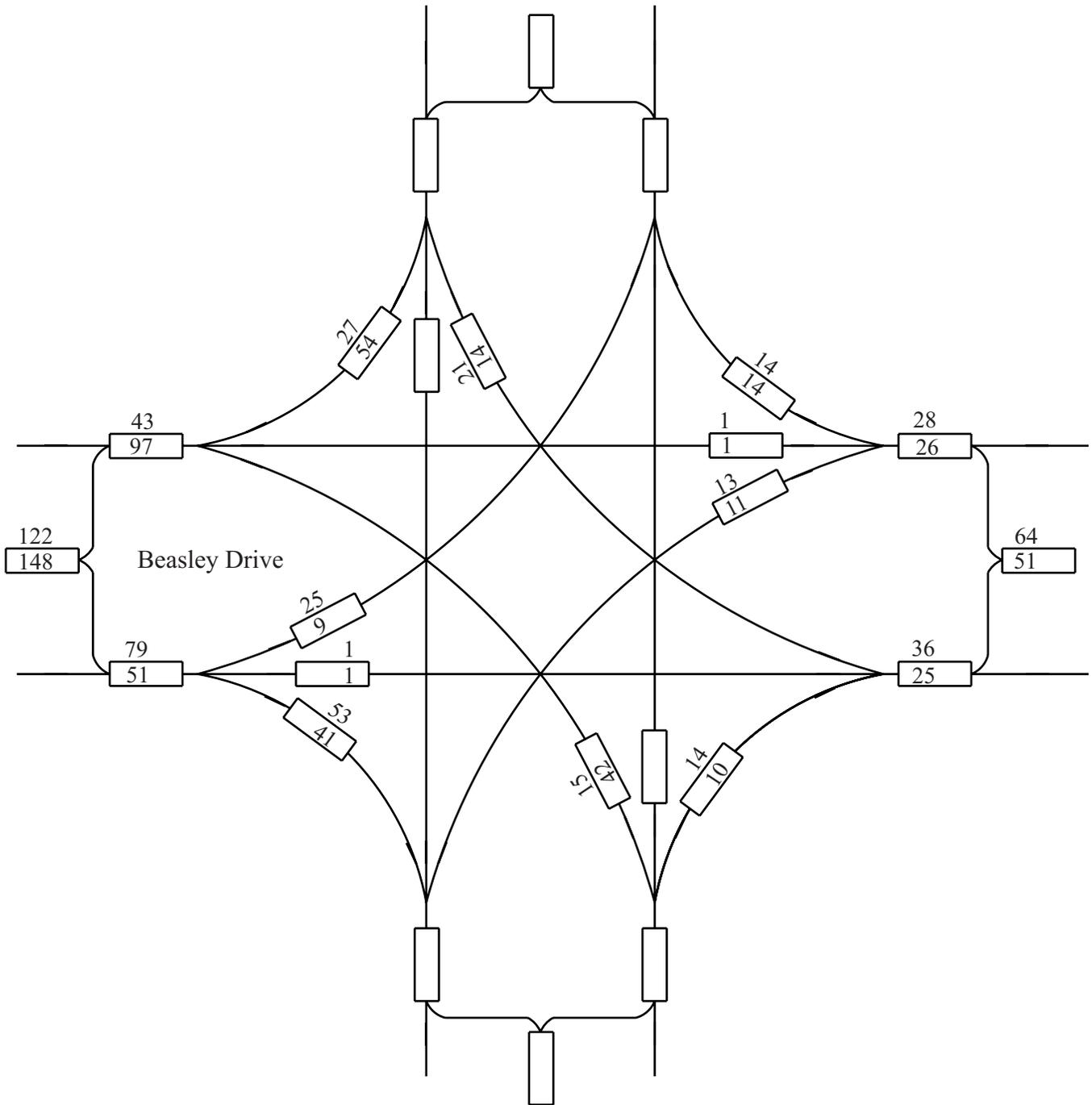


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Confederate Drive
 Year Year 2012 DHVs
 Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

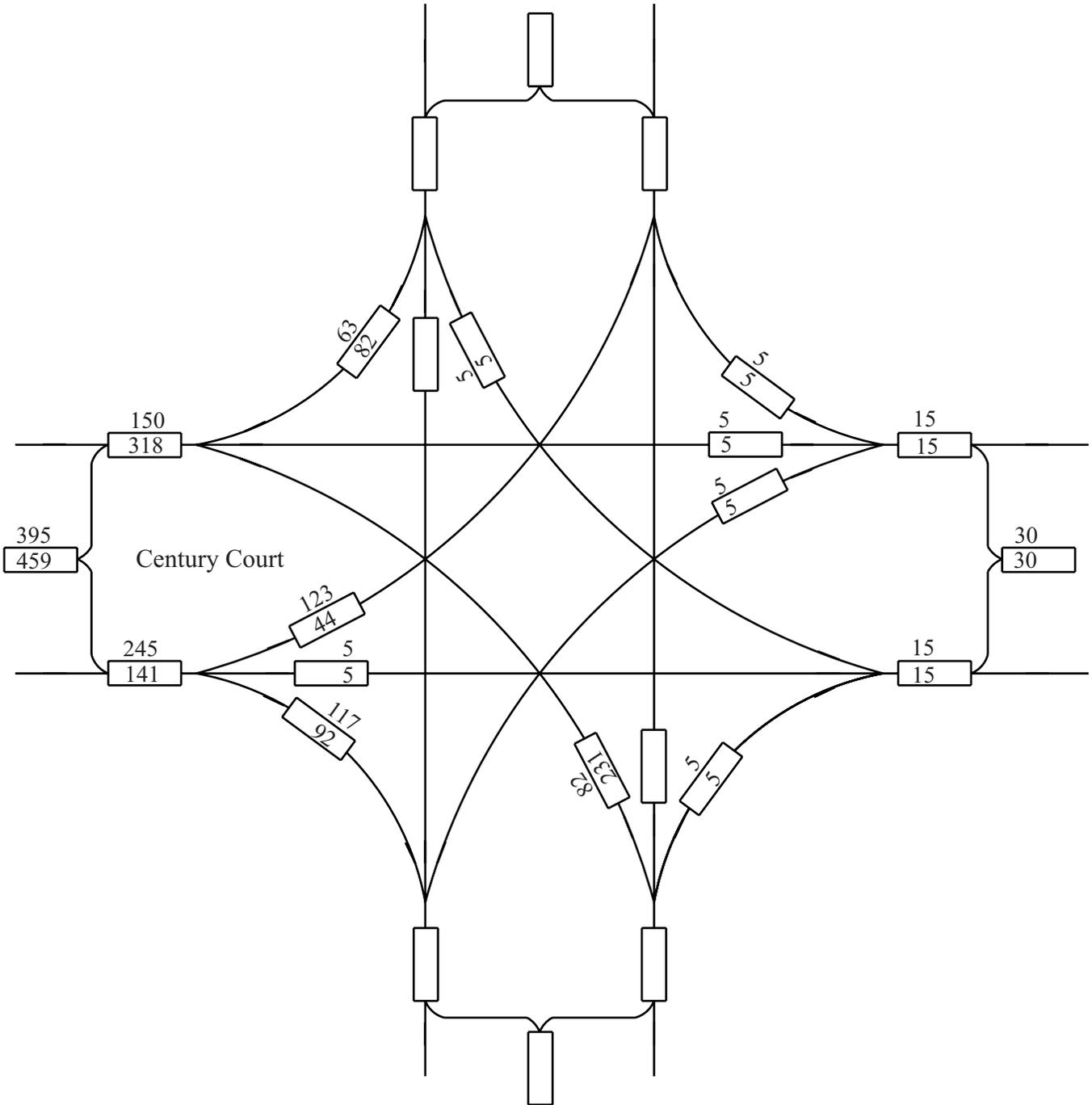
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Beasley Drive

Year Year 2012 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

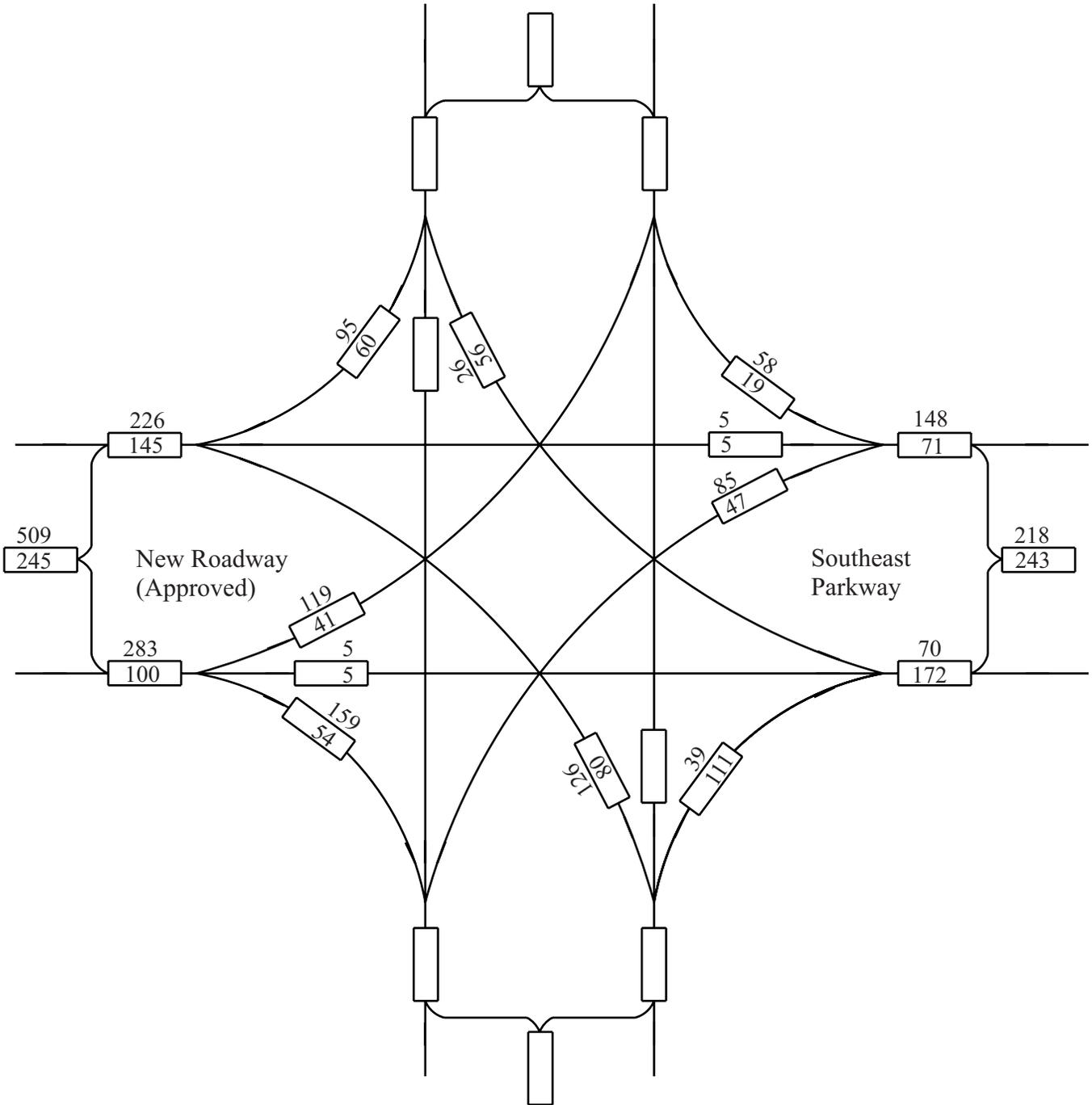
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Century Court

Year Year 2012 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

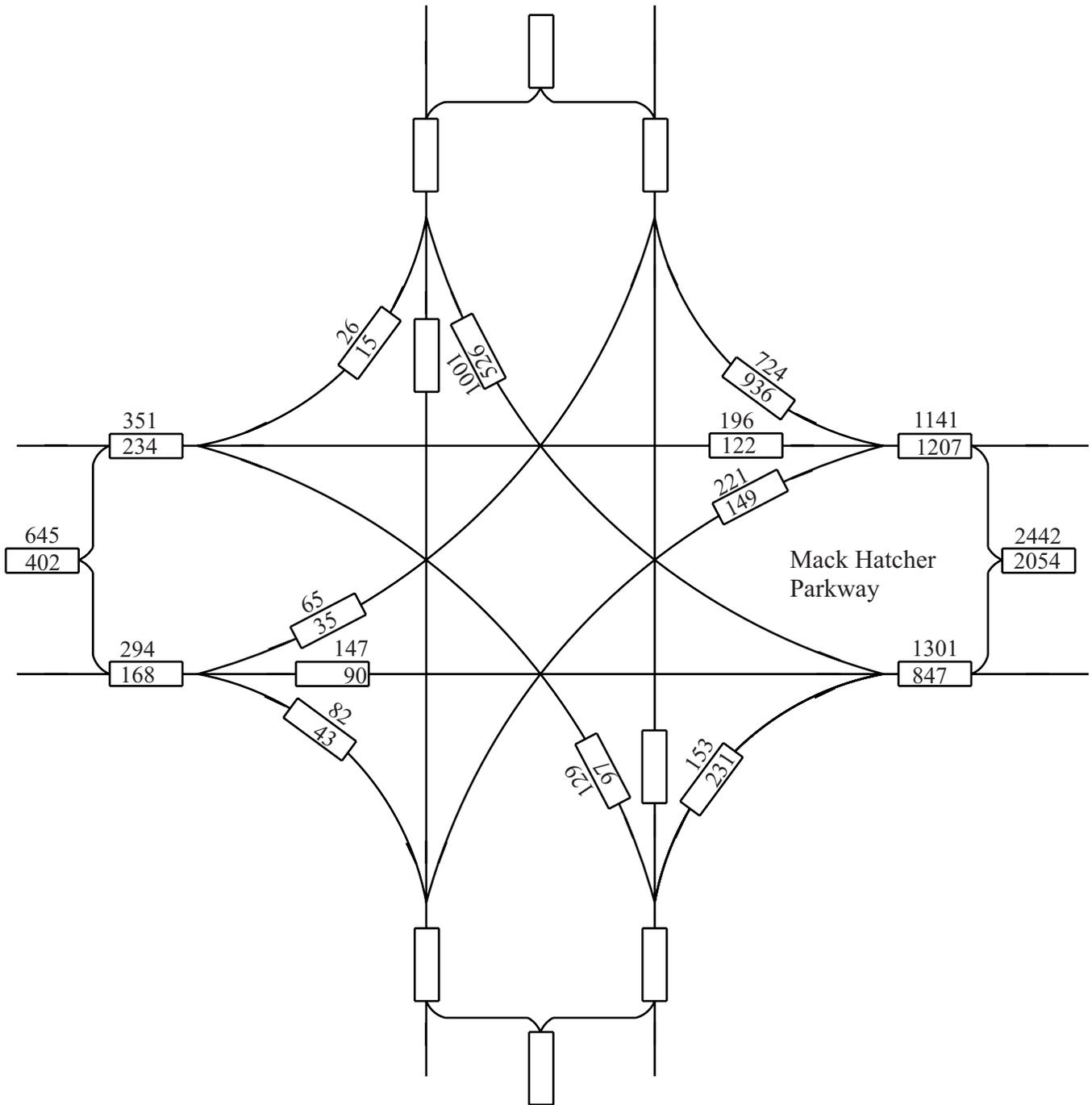
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Southeast Parkway

Year Year 2012 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

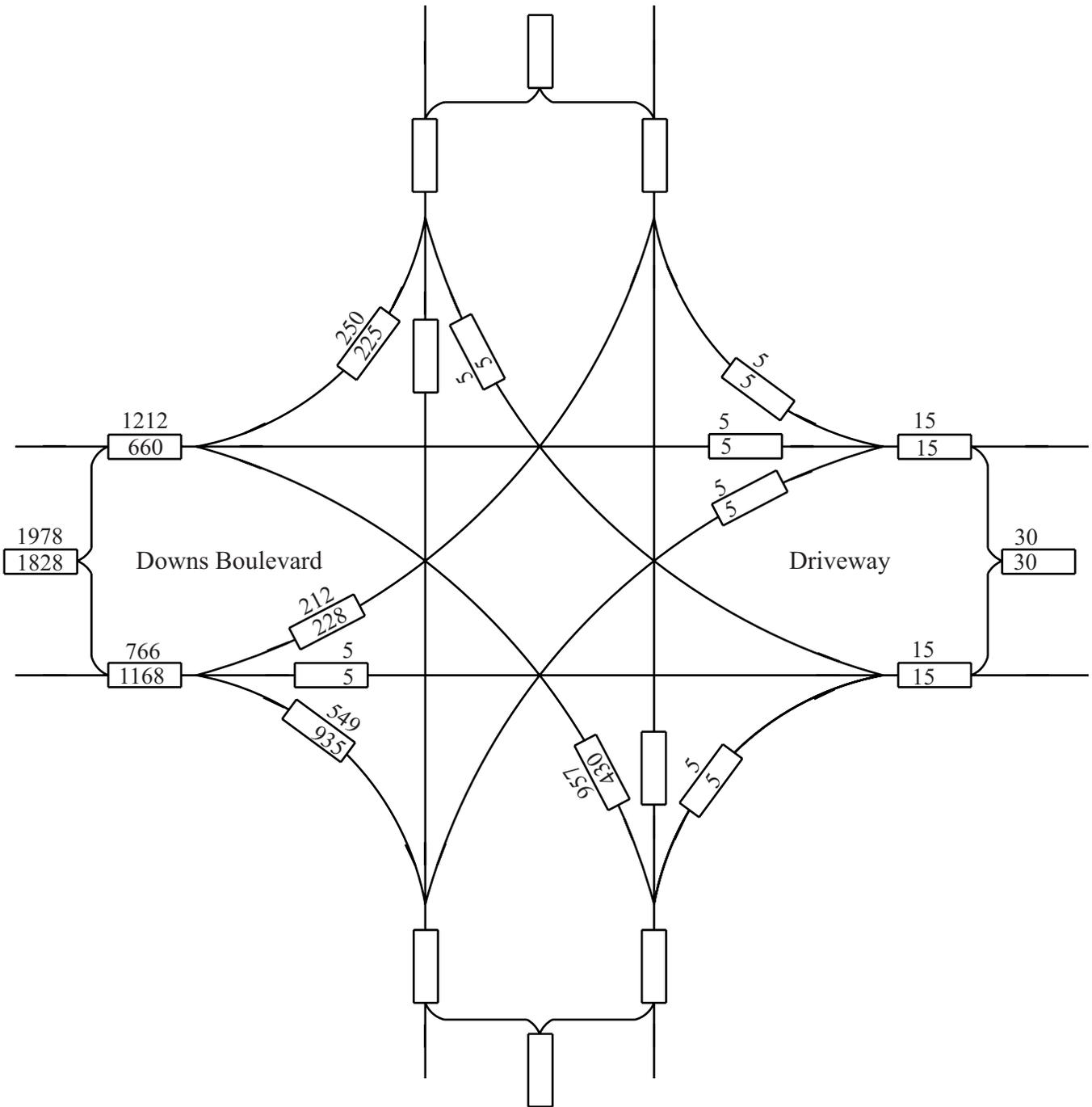
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Mack Hatcher Parkway

Year Year 2012 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

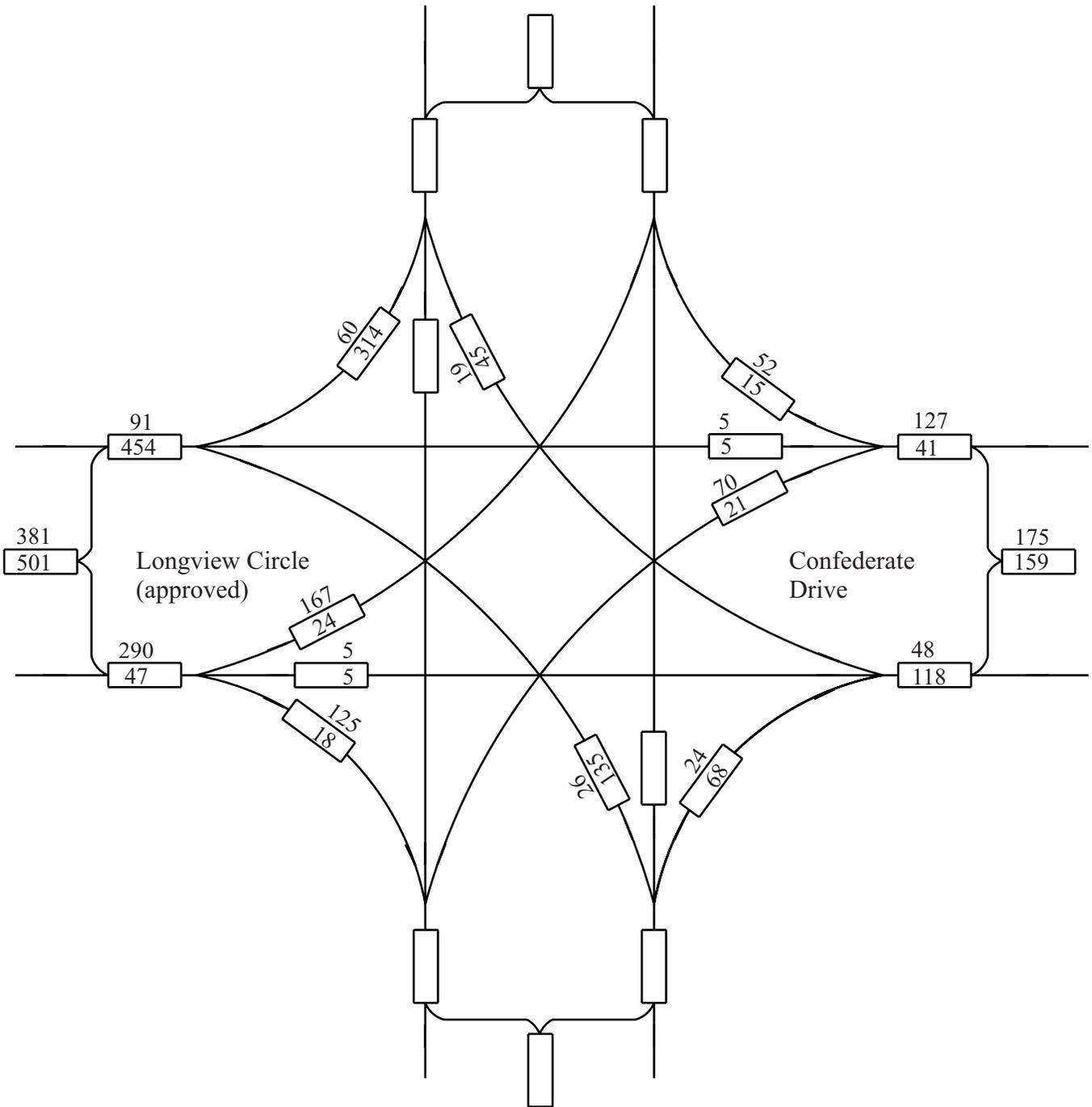
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Downs Boulevard

Year Year 2032 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

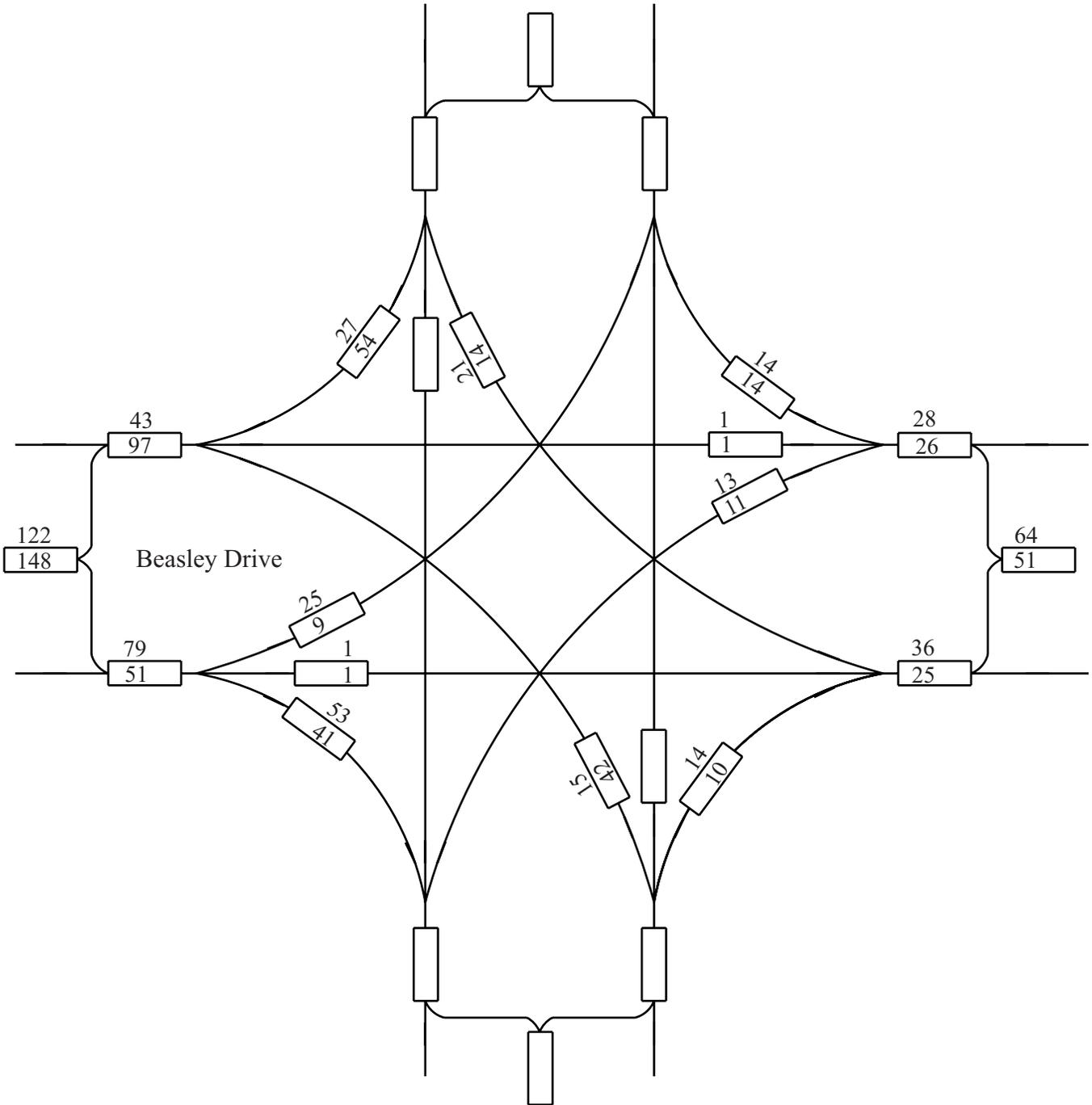
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Confederate Drive

Year Year 2032 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

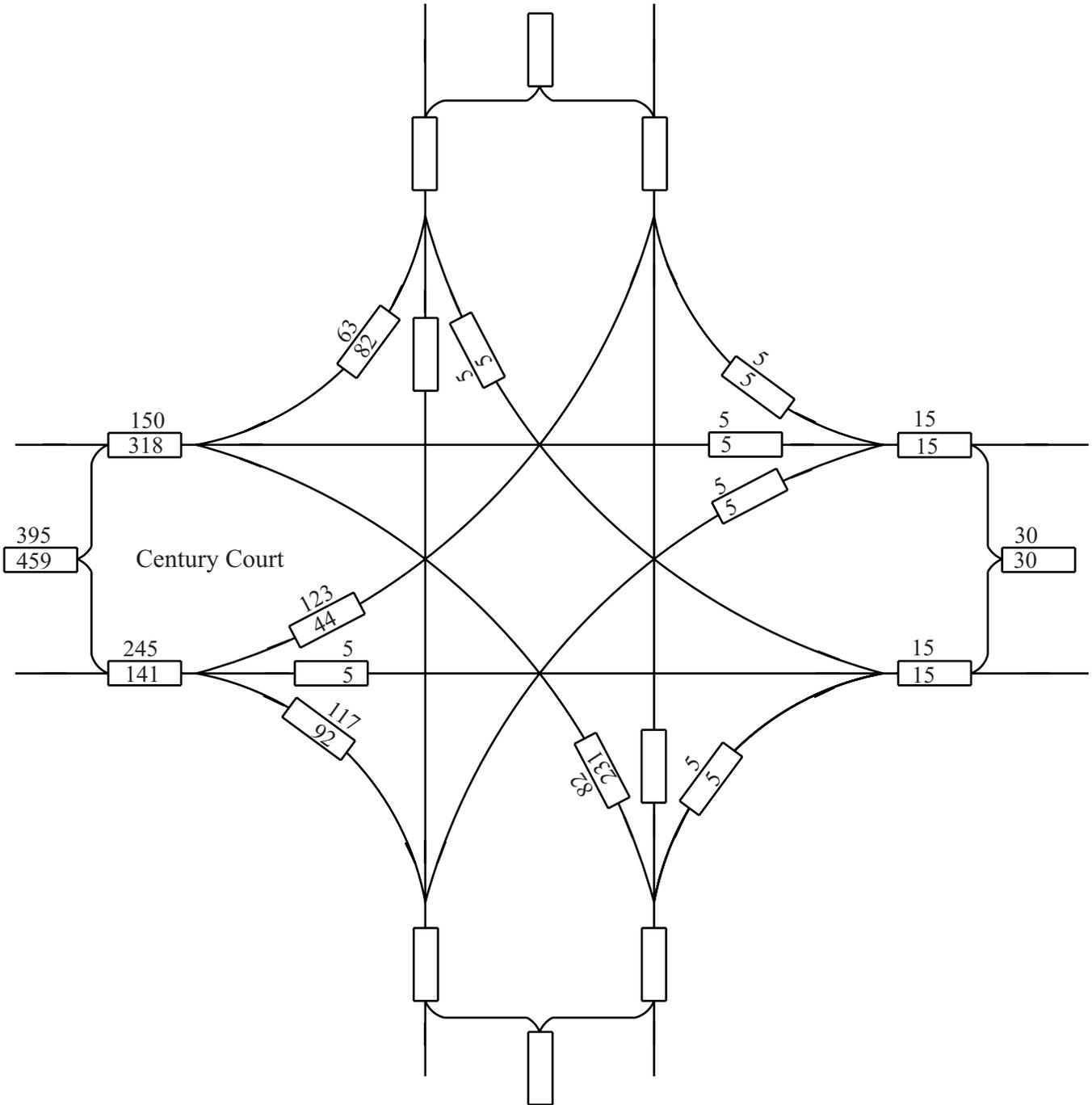
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Beasley Drive

Year Year 2032 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

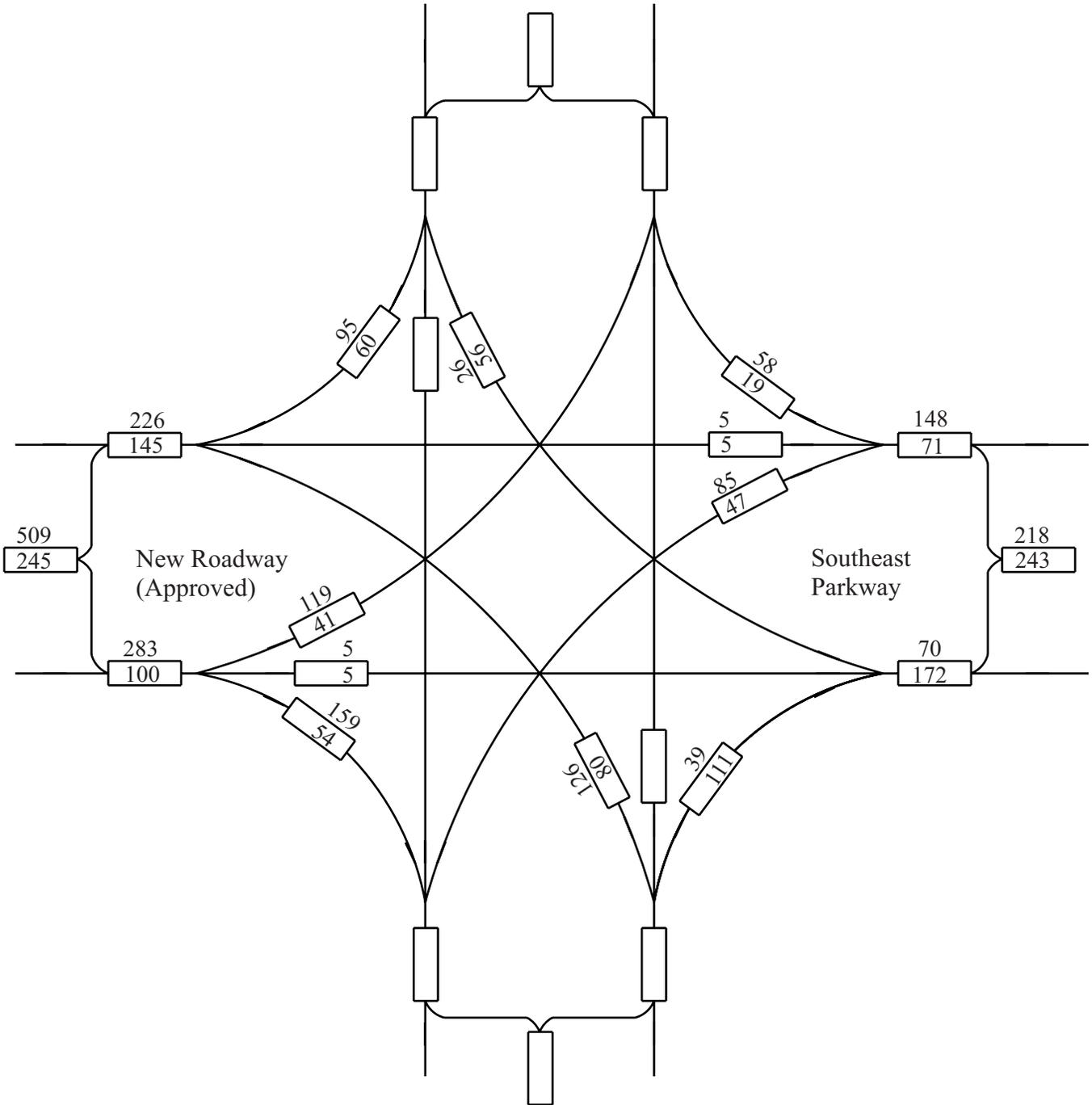
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Century Court

Year Year 2032 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

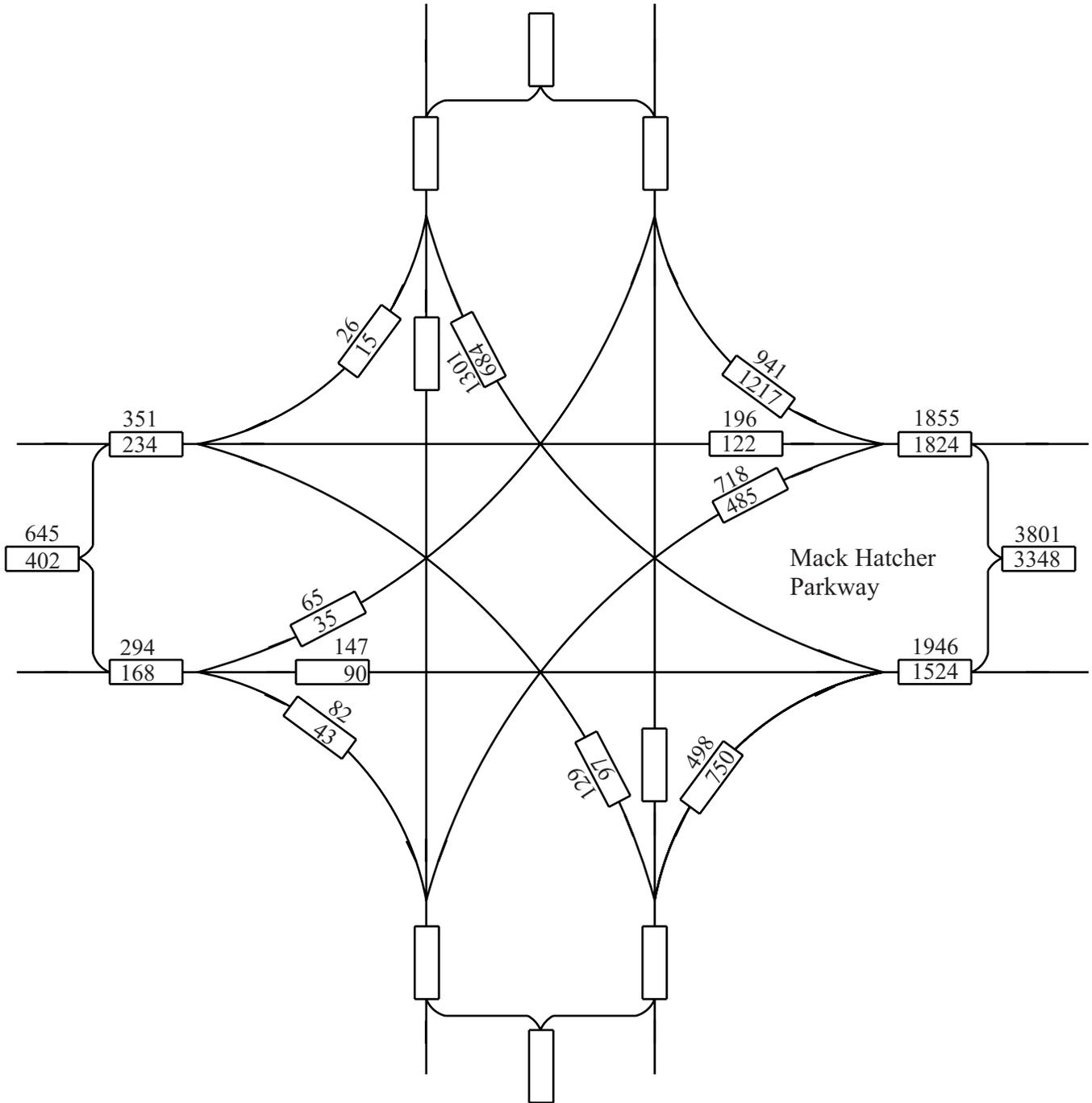
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Southeast Parkway

Year Year 2032 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

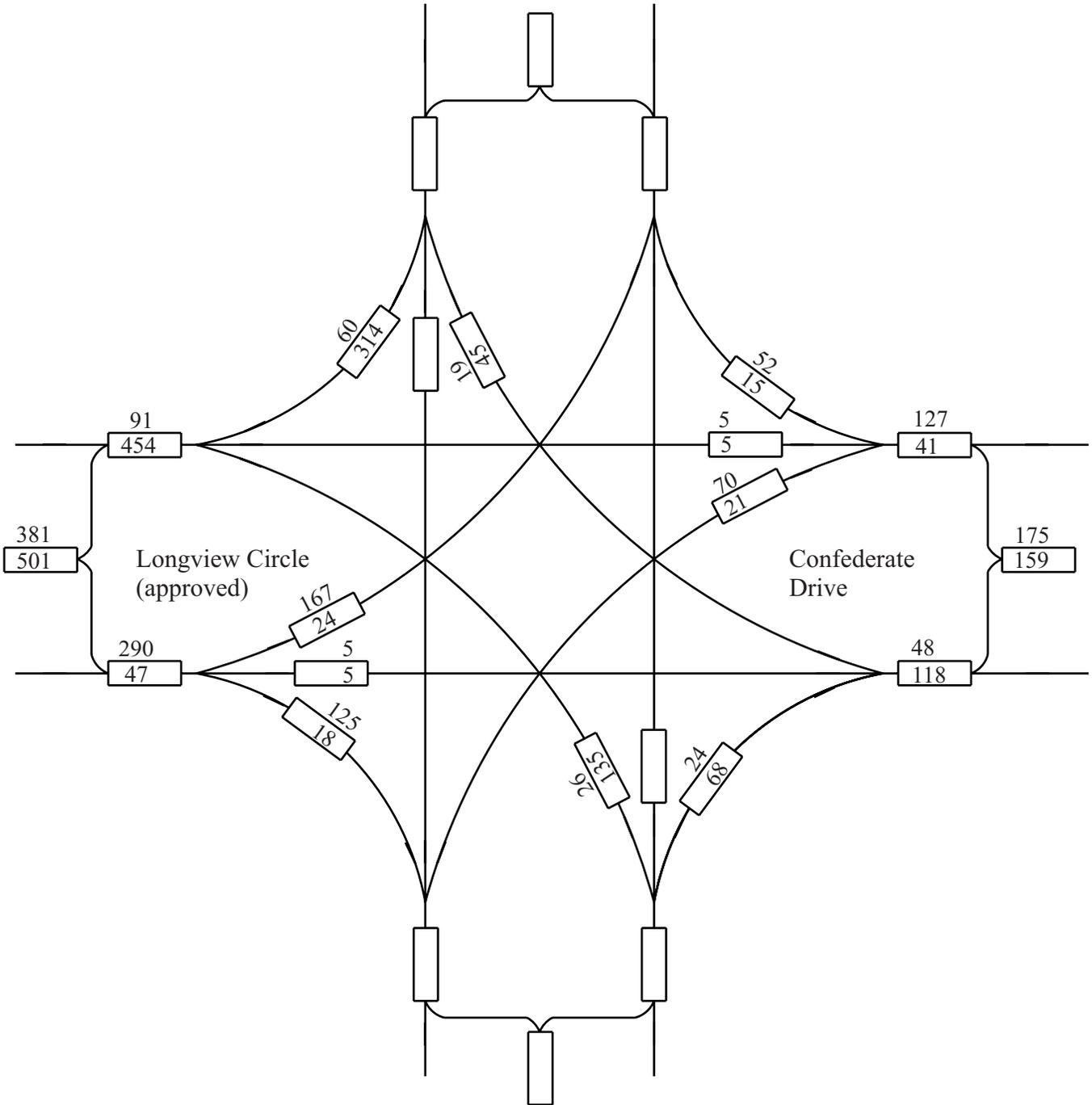
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Mack Hatcher Parkway

Year Year 2032 DHVs

Description Existing Roadway Network

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

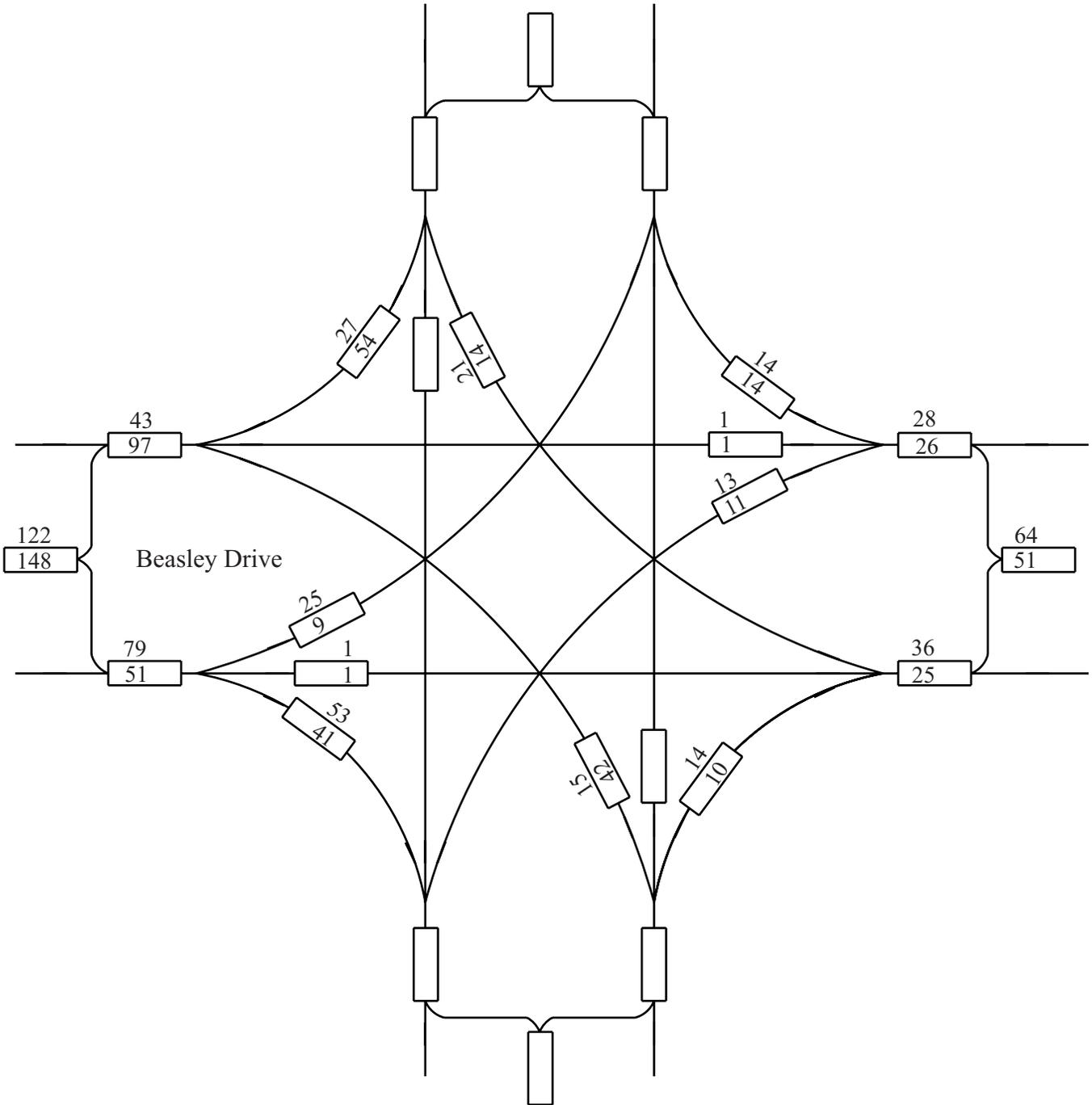


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Confederate Drive
 Year Year 2012 DHVs
 Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

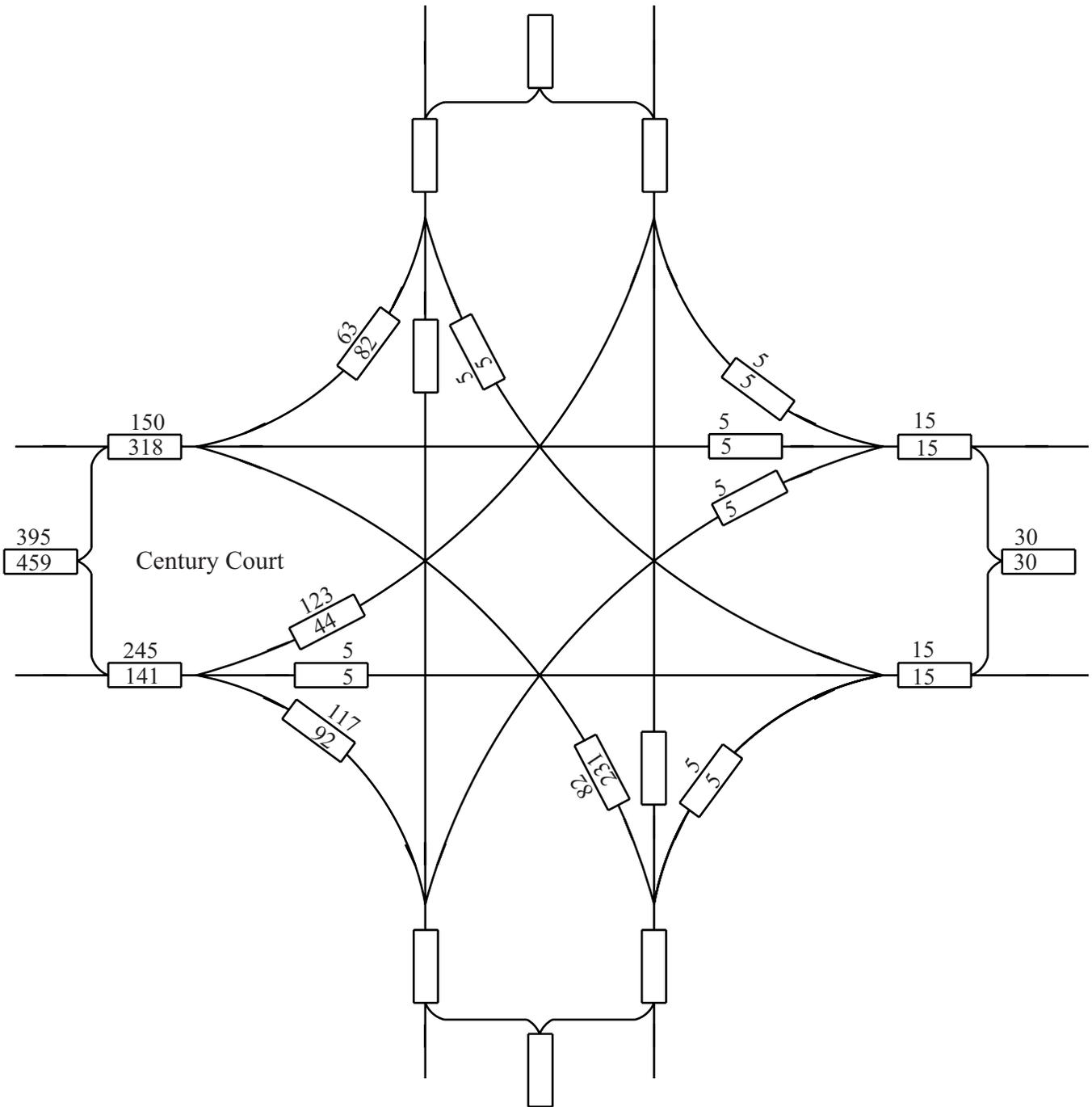
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Beasley Drive

Year Year 2012 DHVs

Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

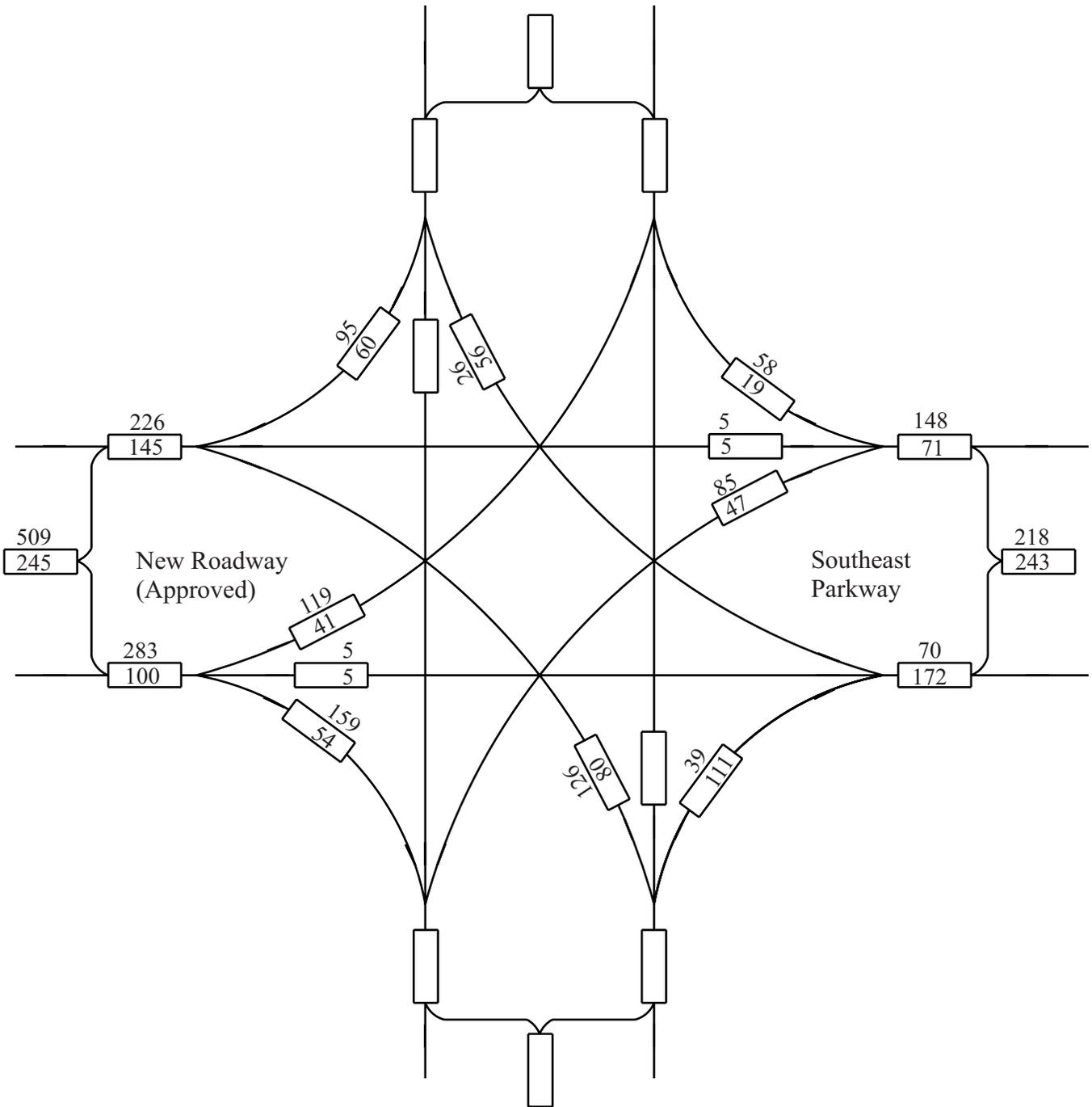
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Century Court

Year Year 2012 DHVs

Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

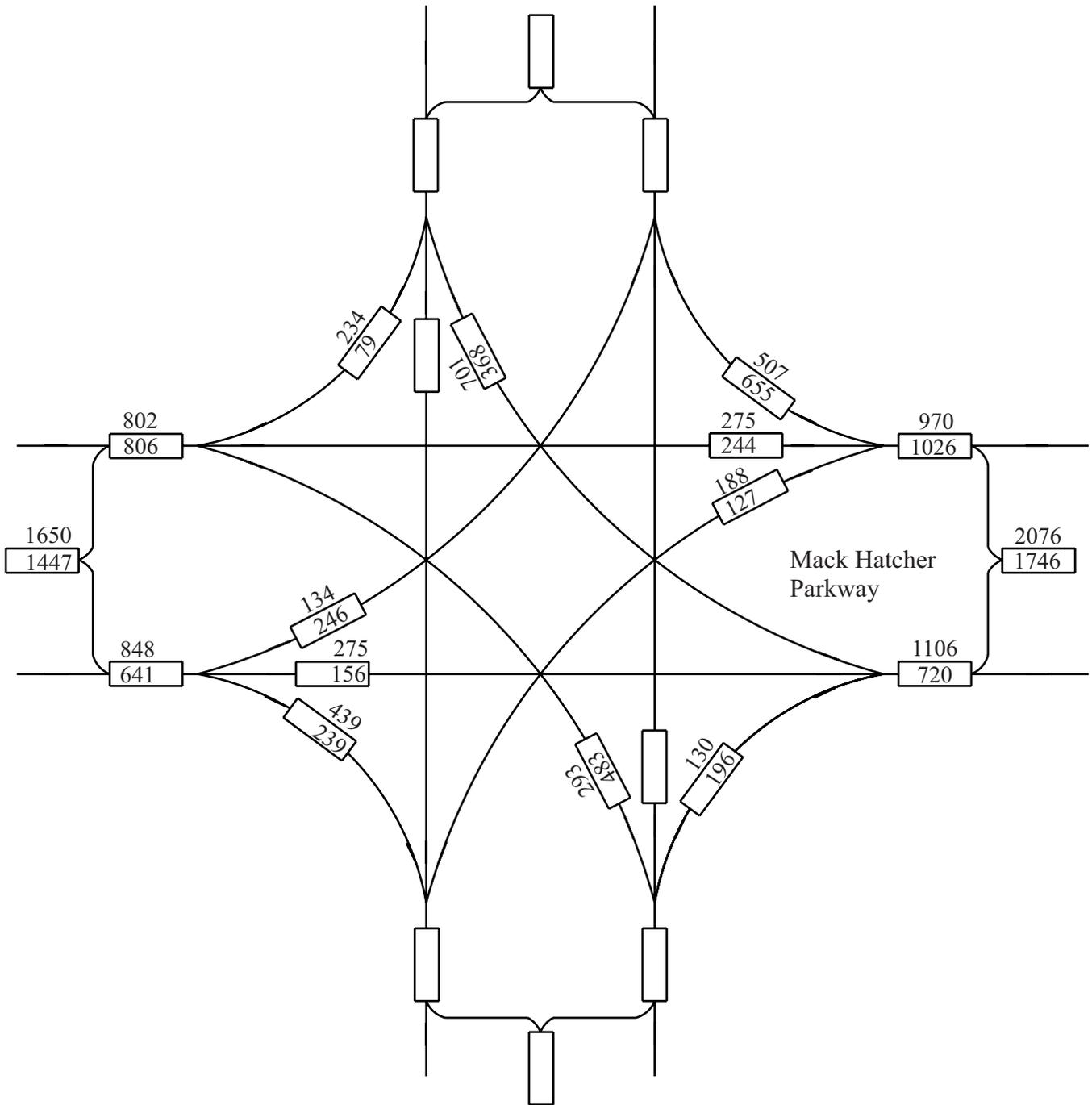


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Southeast Parkway
 Year Year 2012 DHVs
 Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

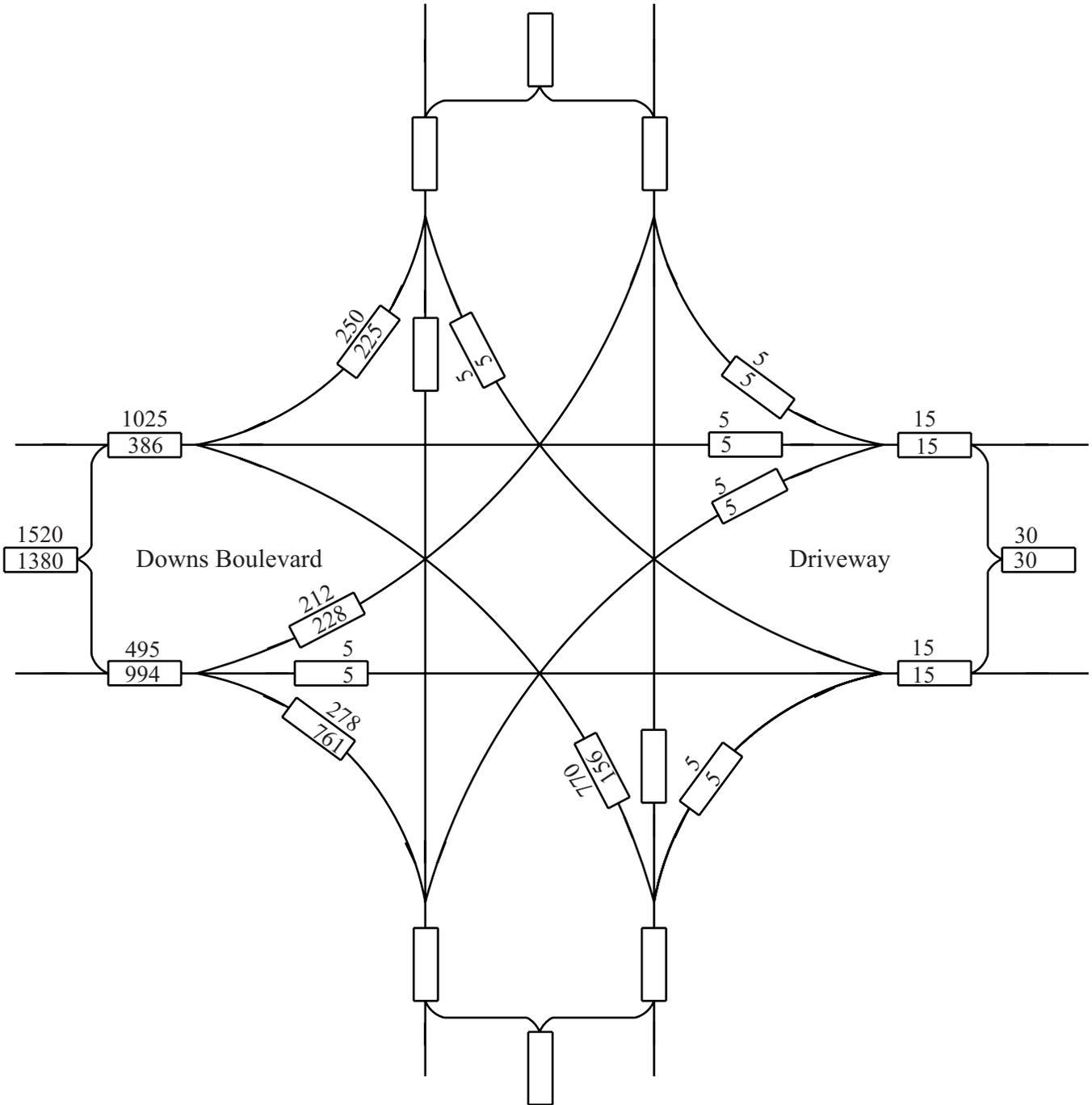
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Mack Hatcher Parkway

Year Year 2012 DHVs

Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

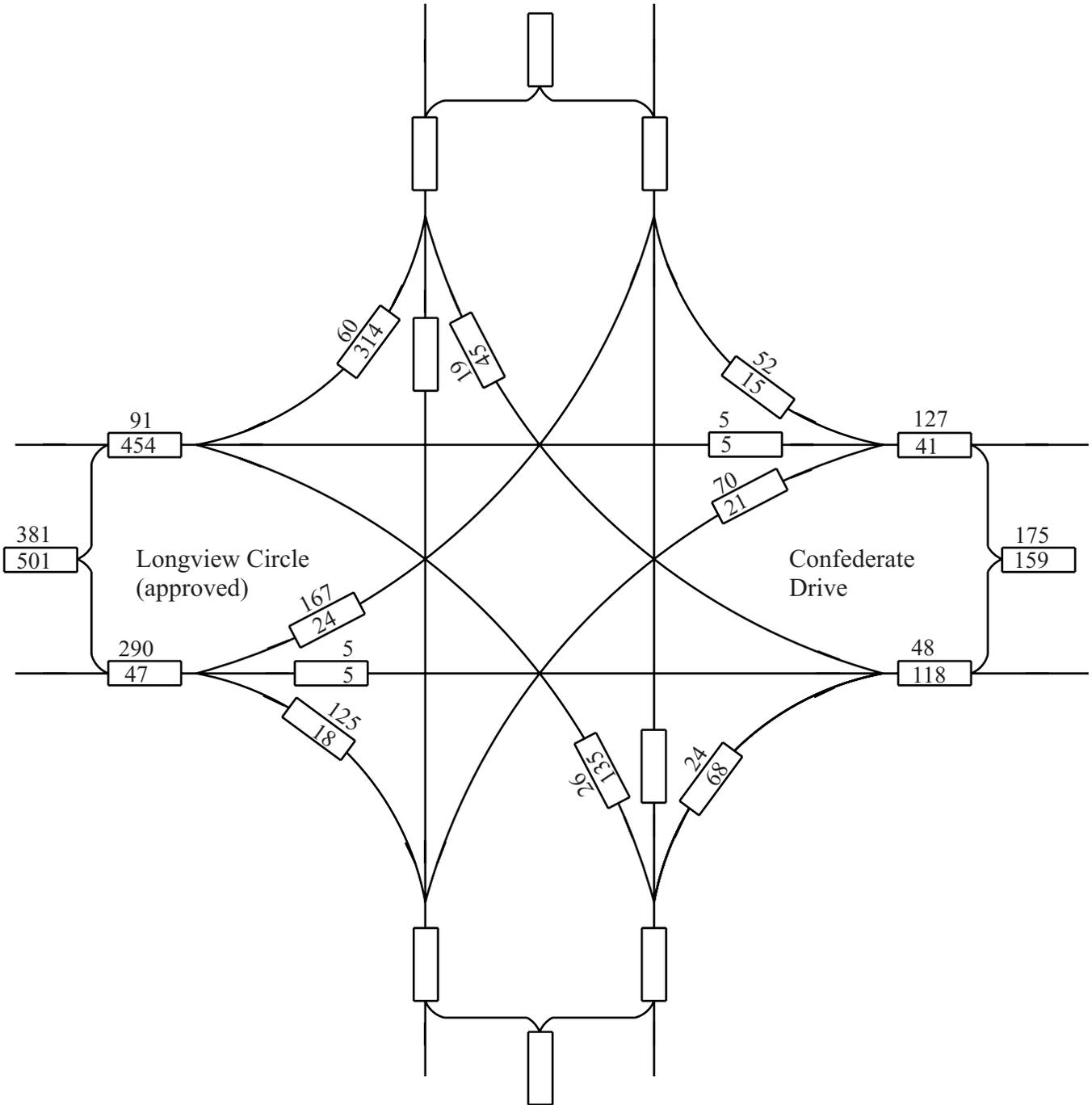
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Downs Boulevard

Year Year 2032 DHVs

Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

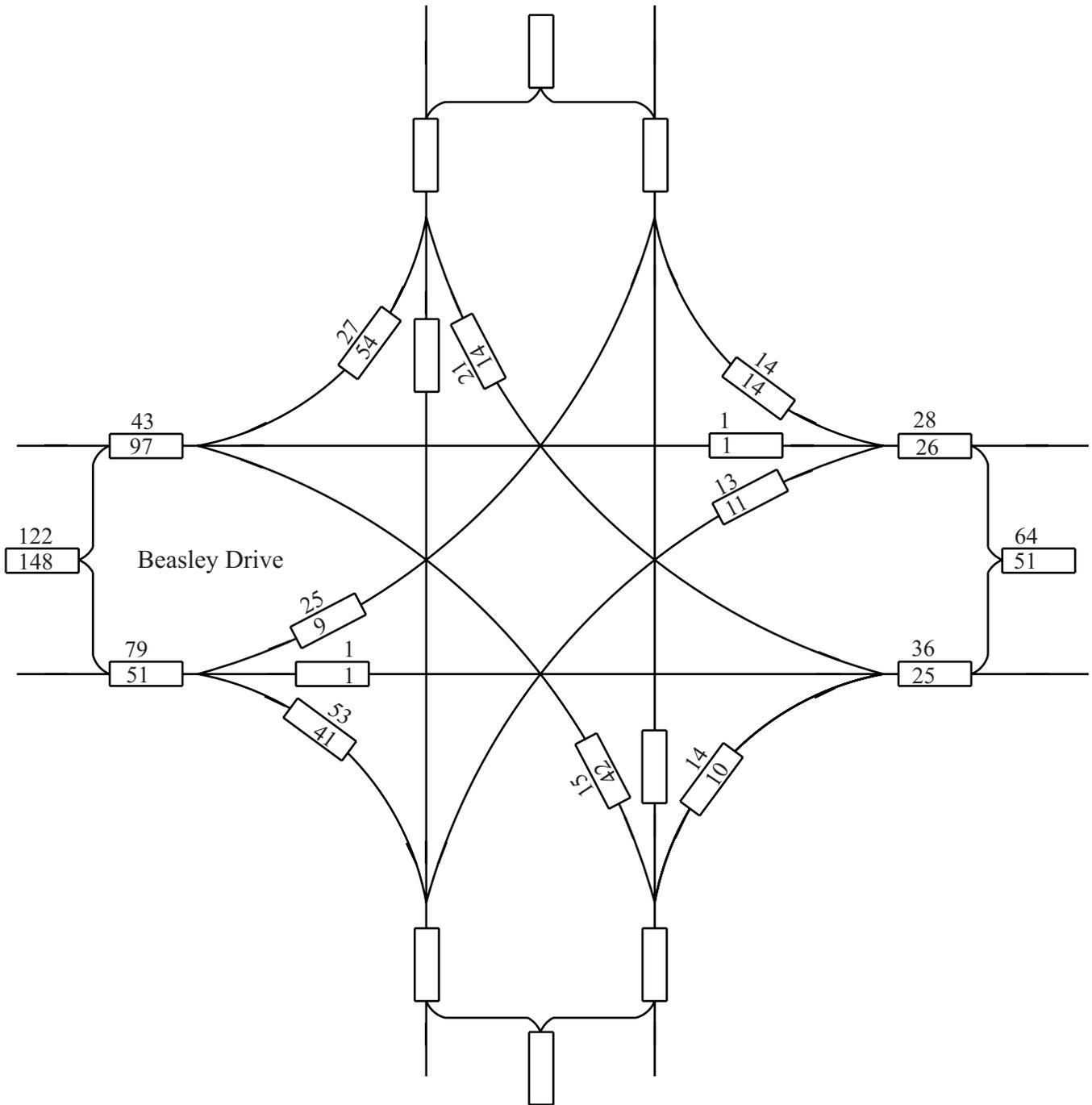


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Confederate Drive
 Year Year 2032 DHVs
 Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

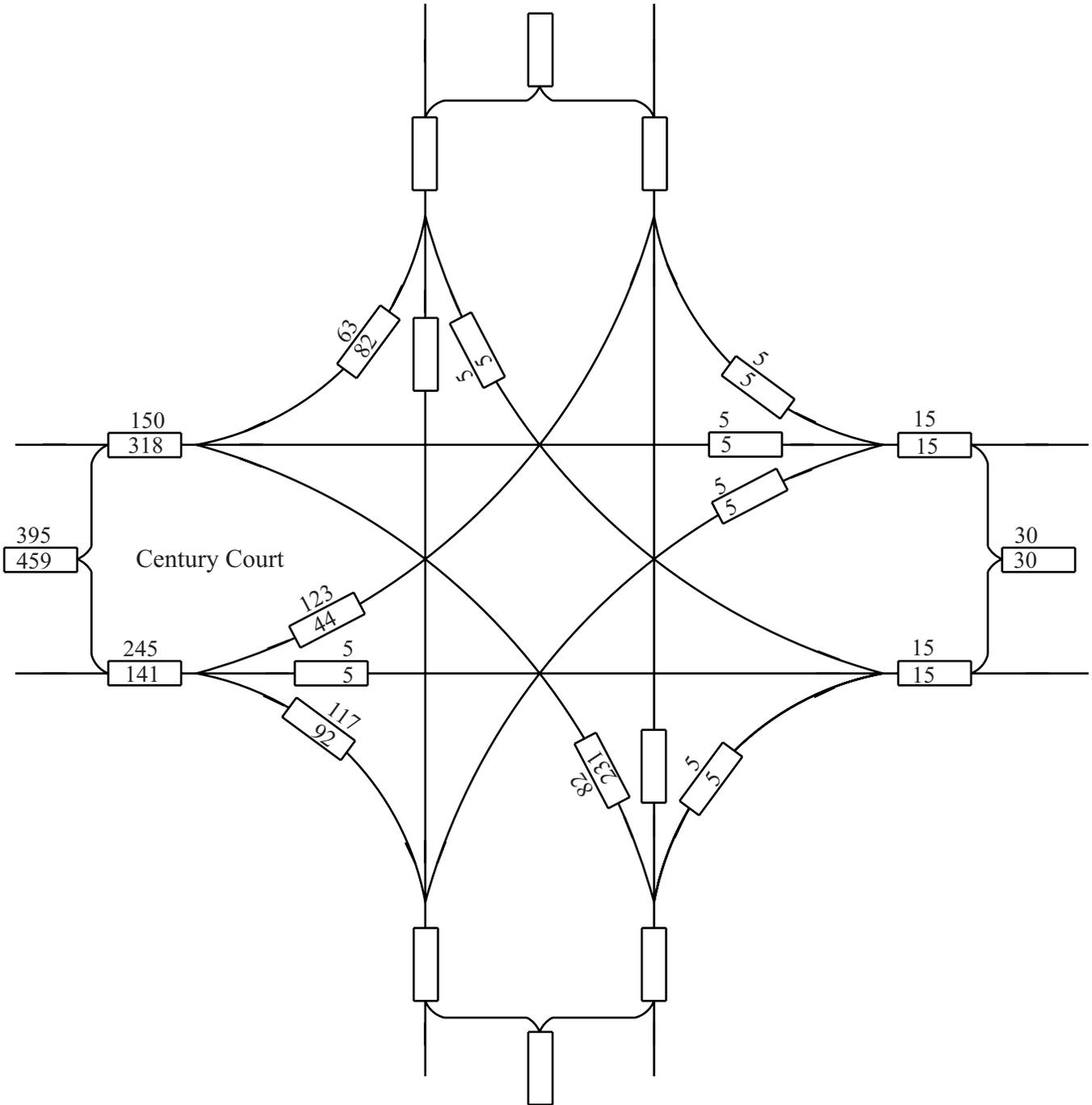


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Beasley Drive
 Year Year 2032 DHVs
 Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

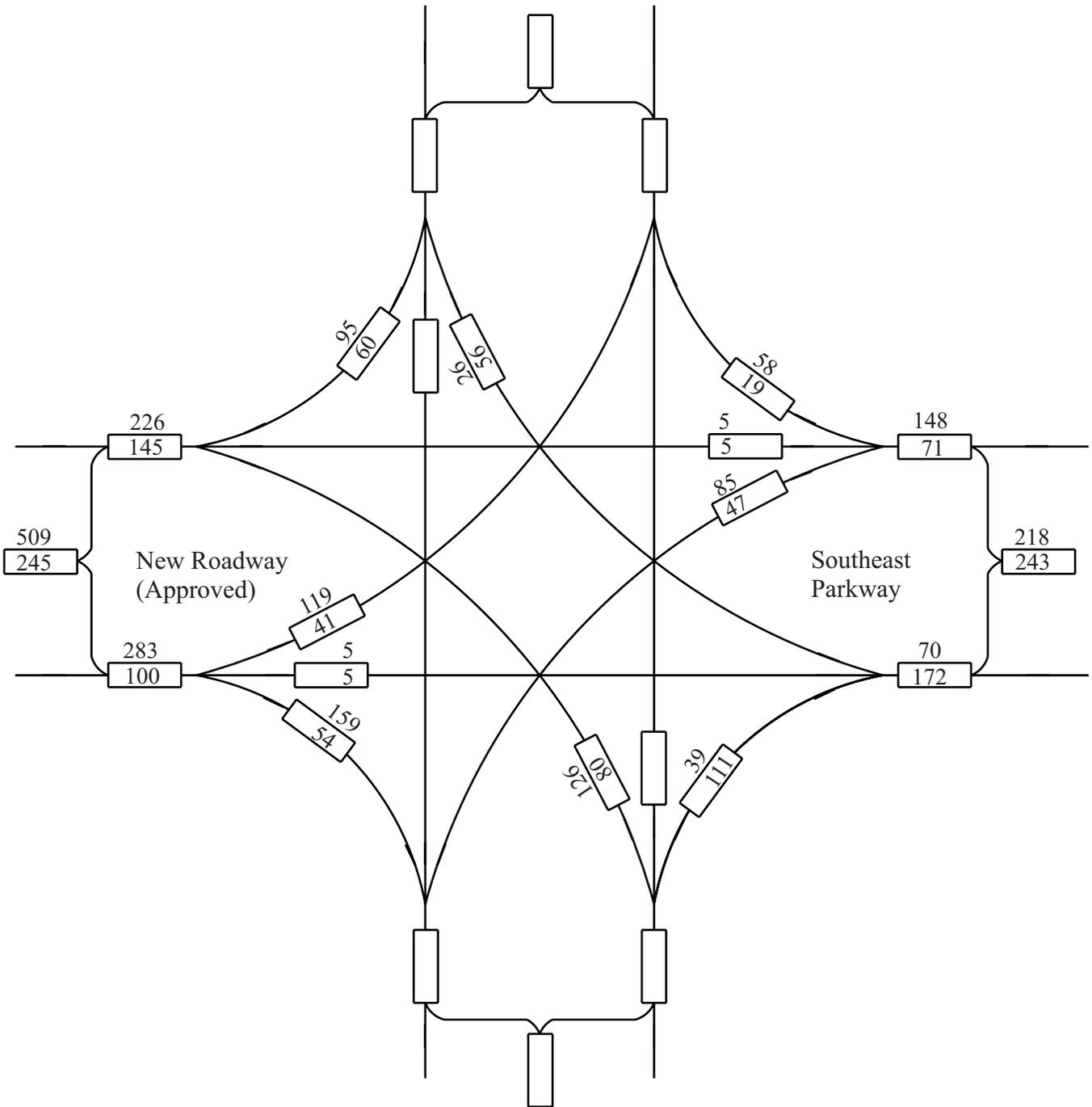


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Century Court
 Year Year 2032 DHVs
 Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning

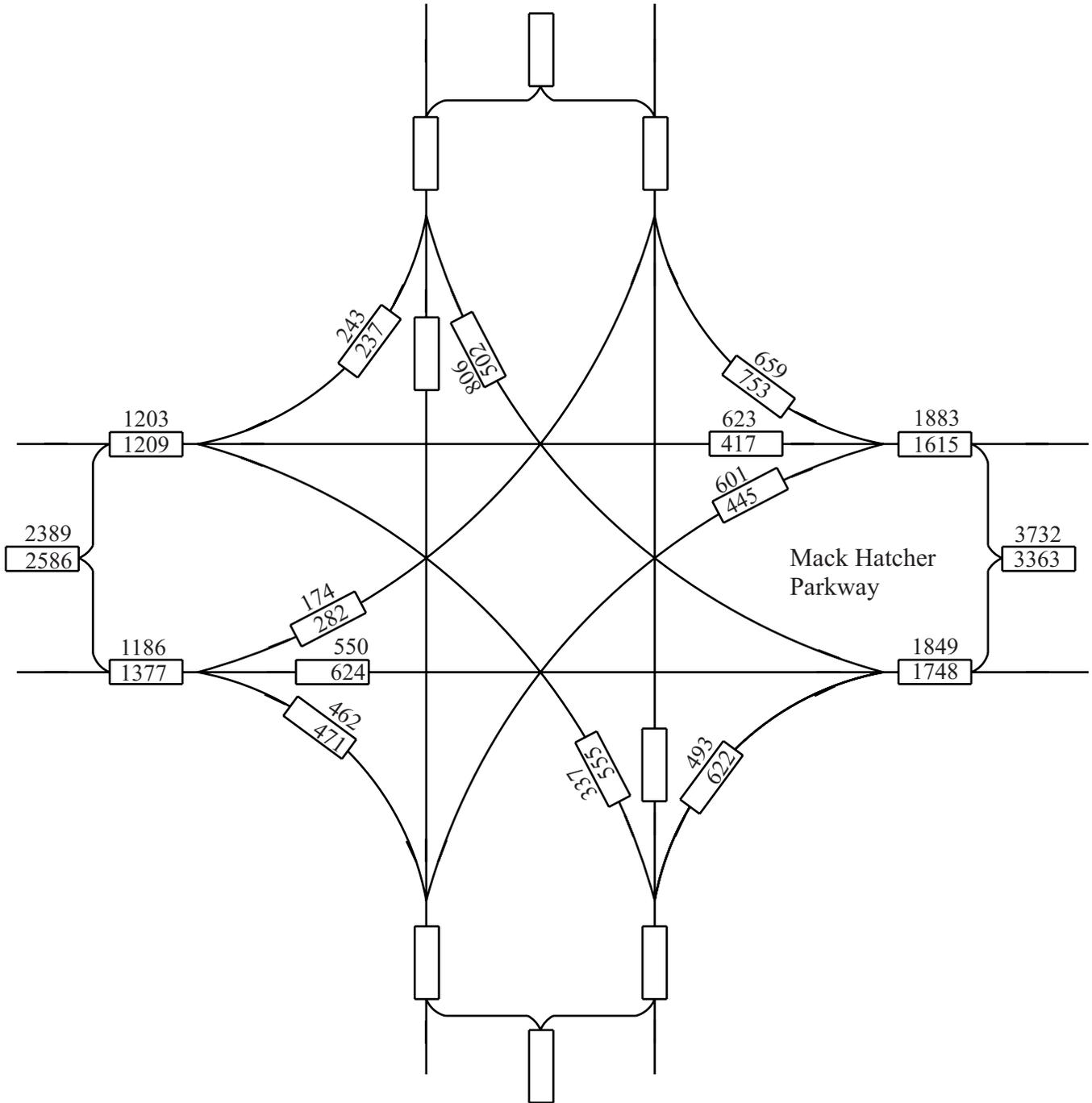


No Scale

XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Southeast Parkway
 Year Year 2032 DHVs
 Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
 Traffic Engineering and Planning



No Scale

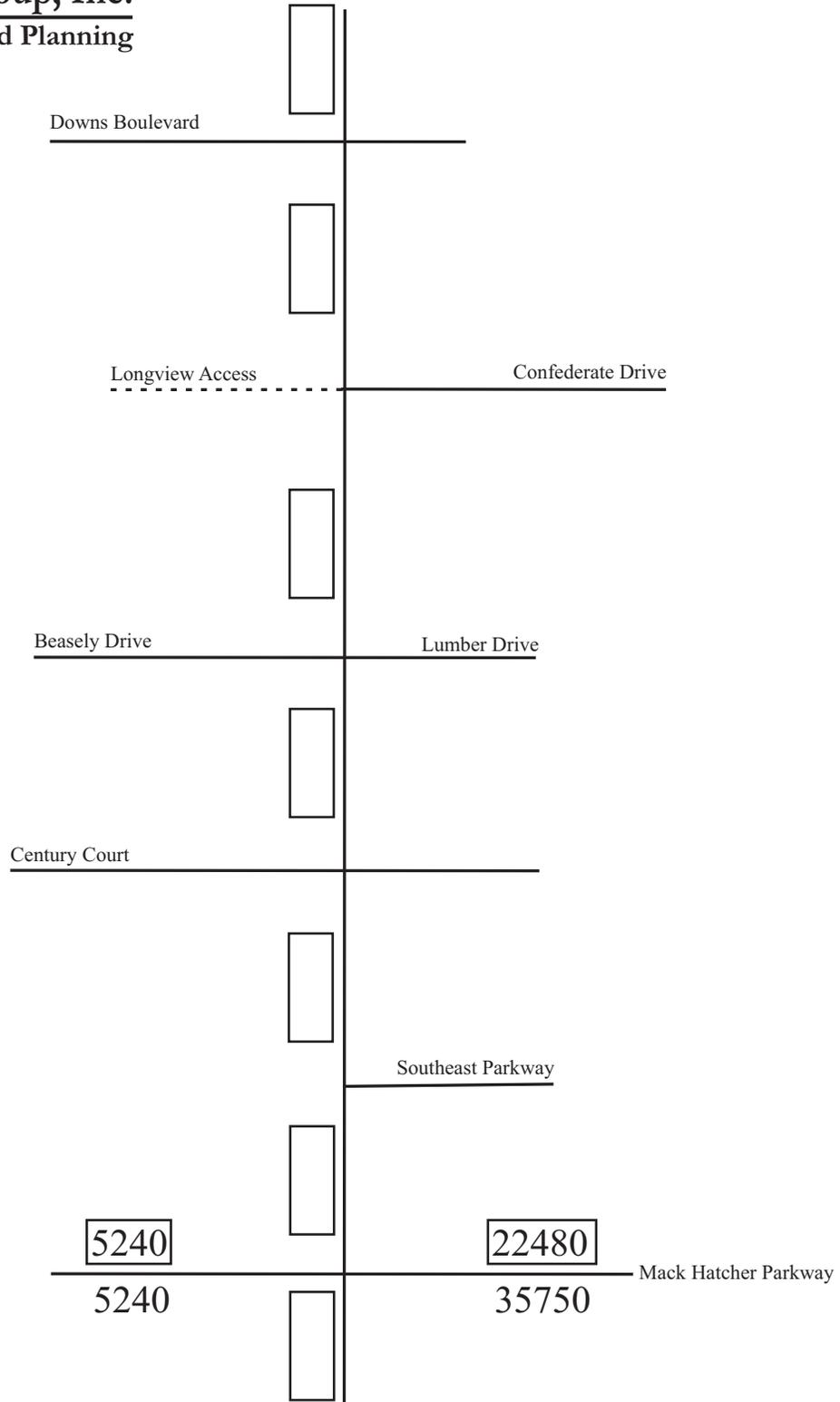
XX - AM Peak Hour Volumes
 XX - PM Peak Hour Volumes

Location Columbia Pike and Mack Hatcher Parkway

Year Year 2032 DHVs

Description Future Network (with Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
Traffic Engineering and Planning

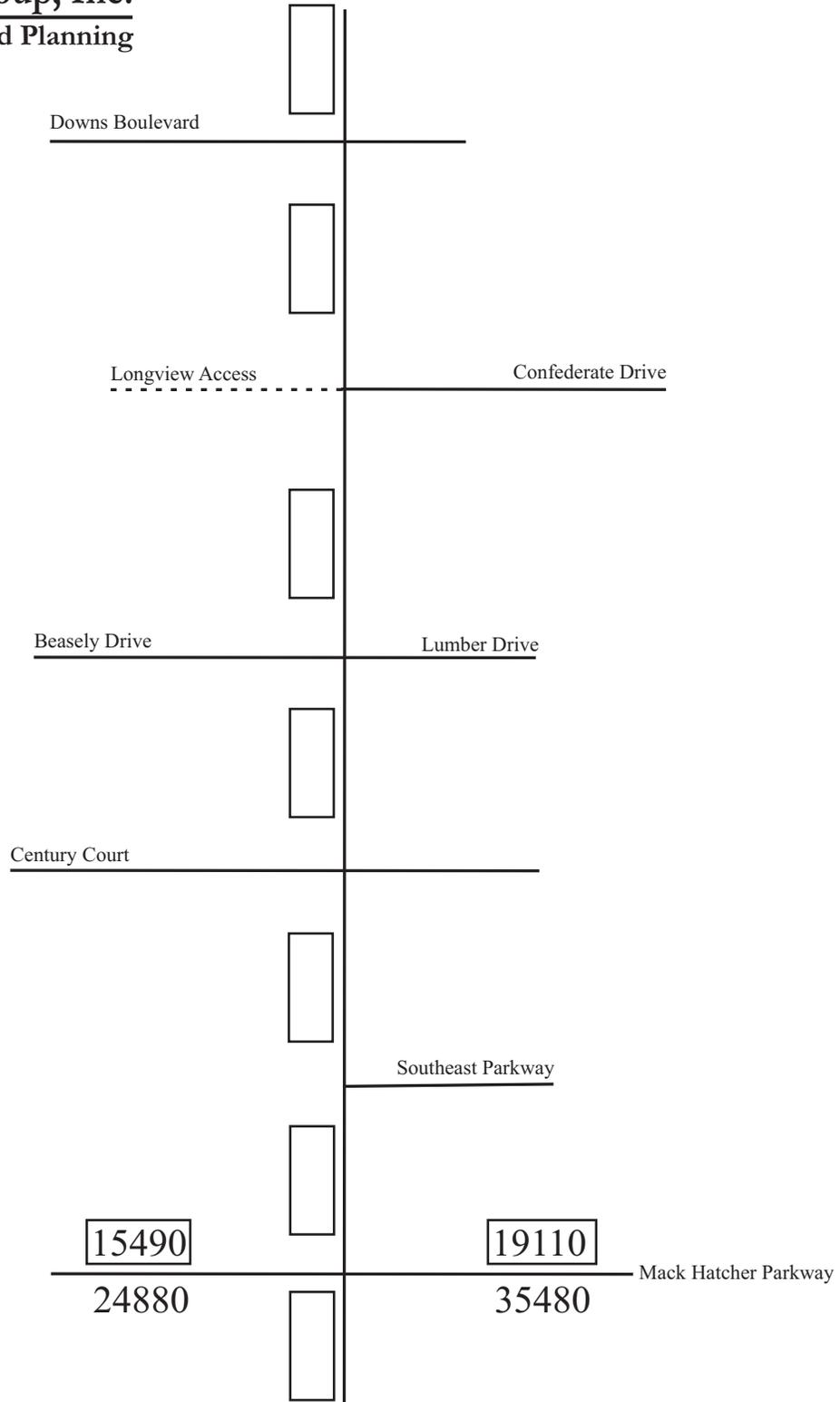


No Scale

XX - Year 2012 ADTs
XX - Year 2032 ADTs

Location Columbia Pike
 Year Year 2012 and Year 2032 ADTs
 Description Existing Network (w/o Mack Hatcher Ext.)

F i s c h b a c h
Transportation Group, Inc.
Traffic Engineering and Planning



No Scale

XX - Year 2012 ADTs
XX - Year 2032 ADTs

Location Columbia Pike
 Year Year 2012 and Year 2032 ADTs
 Description Future Network (with Mack Hatcher Ext.)

APPENDIX – TYPICAL CROSS-SECTIONS AND FUNCTIONAL PLANS



**CITY OF FRANKLIN
DEPARTMENT OF ENGINEERING
WILLIAMSON COUNTY**

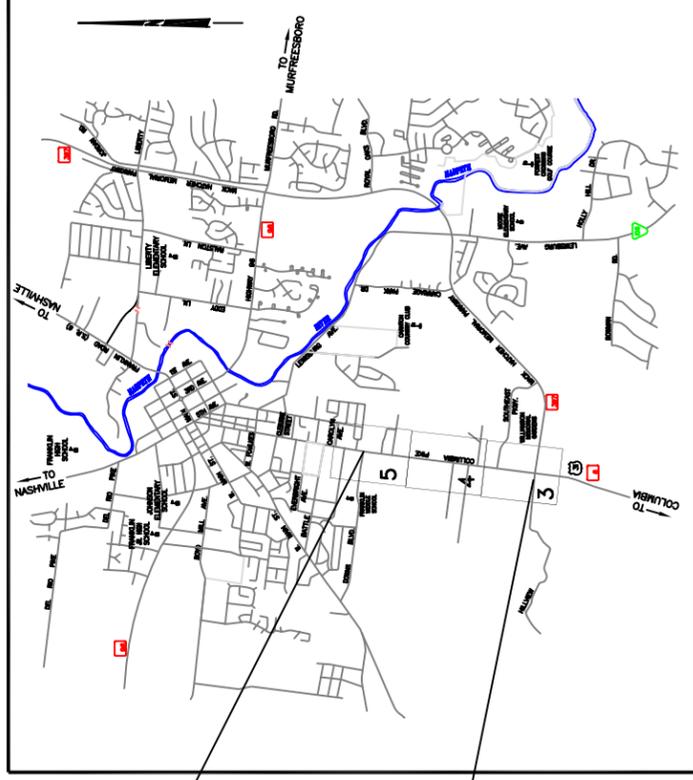
INDEX OF SHEETS

FUNCTIONAL PLANS

- 1 TITLE SHEET
- 2, 2A TYPICAL SECTIONS
- 3, 4, 5 FUNCTIONAL LAYOUTS

ARMY CORPS OF ENGINEERS PERMIT _____
 WATER QUALITY PERMIT NO.: _____
 T.D.O.T. PERMIT NO.: _____
 N.P.D.E.S. PERMIT NO.: _____

FUNCTIONAL



END PROJECT
DOWNS BLVD.
STA. 82+25±

BEGIN PROJECT
MACK HATCHER PKWY.
STA. 20+40

SPECIAL NOTE

PROPOSALS MAY BE REJECTED BY THE FRANKLIN TRANSPORTATION COMMITTEE IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

 THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED: MARCH 1, 2006 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE CONSTRUCTION DOCUMENTS

DESIGNED BY SULLIVAN ENGINEERING, INC.
 DESIGNER RICHARD D. SULLIVAN, P.E.
 CONTACT PAUL V. COLLINS

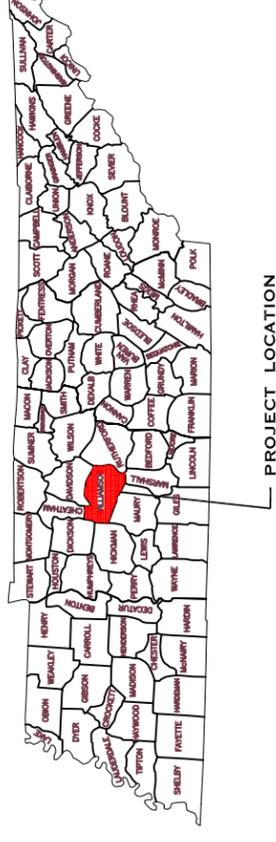
LOCATION MAP

NOT TO SCALE

APPROX. PROJECT LENGTH 6,185 LF

| |
|---------------------------|
| RIGHT-OF-WAY PLANS ISSUED |
| CONSTRUCTION PLANS ISSUED |

NO EQUATIONS, NO EXCLUSIONS



APPROVED BY:

MAYOR, CITY OF FRANKLIN DATE

DIRECTOR OF ENGINEERING, CITY OF FRANKLIN DATE

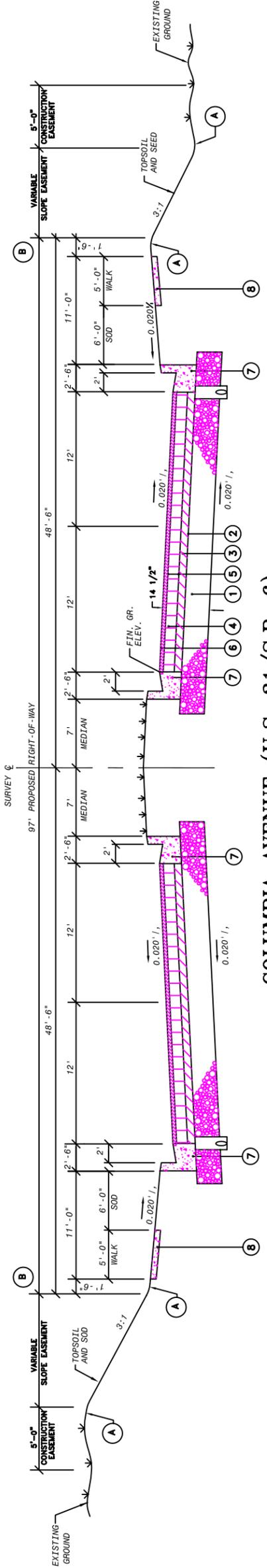


SULLIVAN ENGINEERING, INC.
 1722B GEN. GEO. PATTON DRIVE
 SUITE 400 BRENTWOOD, TN. 37027

| | |
|---------------------------|----------------|
| S.E.I. PROJECT NO. 612 | SHEET NO. 1 |
| CITY OF FRANKLIN | |

| | | | |
|-------|------|-------------|-----------|
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
| FUNC. | 07 | 612 | 2A |
| | | | |
| | | | |

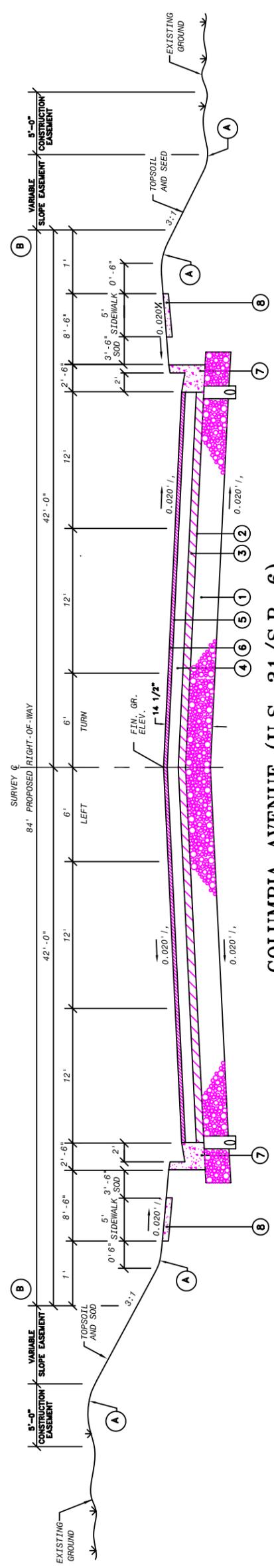
REV. 11-13-07: ADDED THIS SHEET TO THE PLANS.
 REV. 11-07-08: REMOVED REFERENCES TO MULTIPLE OPTIONS.



**COLUMBIA AVENUE (U.S. 31/S.R. 6)
 PROPOSED 4-LANE W/MEDIAN TYPICAL SECTION C**

(FOR ADDITIONAL DETAILS NOT SHOWN COORDINATE WITH T.D.O.T. ST. DING. NO. RD-TS-7A)

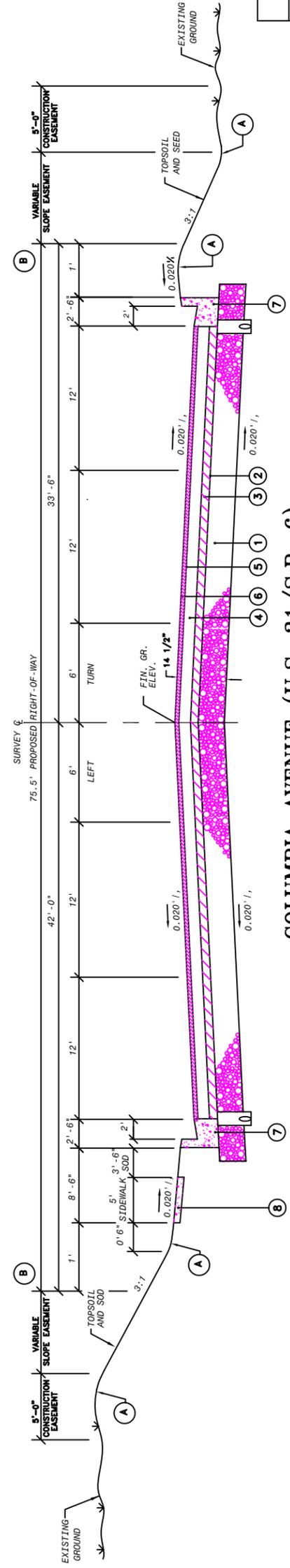
FROM: Alpha Drive TO: Confederate Drive



**COLUMBIA AVENUE (U.S. 31/S.R. 6)
 PROPOSED 5-LANE TYPICAL SECTION C**

(FOR ADDITIONAL DETAILS NOT SHOWN COORDINATE WITH T.D.O.T. ST. DING. NO. RD-TS-7A)

FROM: Confederate Drive TO: James Avenue (End Project)



**COLUMBIA AVENUE (U.S. 31/S.R. 6)
 PROPOSED 5-LANE TYPICAL SECTION C**

(FOR ADDITIONAL DETAILS NOT SHOWN COORDINATE WITH T.D.O.T. ST. DING. NO. RD-TS-7A)

FROM: Confederate Drive TO: James Avenue (End Project)

NOTES

- (A) COORDINATE W/STD. DWG. NO. RD-S-11 & RD-S-11A FOR ROUNDING DETAILS.
- (B) UTILITIES ARE TO BE LOCATED IN THE OUTERMOST 5'-0" OF THE RIGHT-OF-WAY
- (C) COORDINATE WITH FUNCTIONAL LAYOUTS FOR PAVEMENT TRANSITIONS.

THE CITY OF
FRANKLIN

SEI
 SULLIVAN ENGINEERING, INC.
 1700 OHL AND PATTON BLDG.
 INDIANAPOLIS, INDIANA 46204

**COLUMBIA PIKE
 (U.S. 31 / S.R. 6)**

TYPICAL SECTIONS

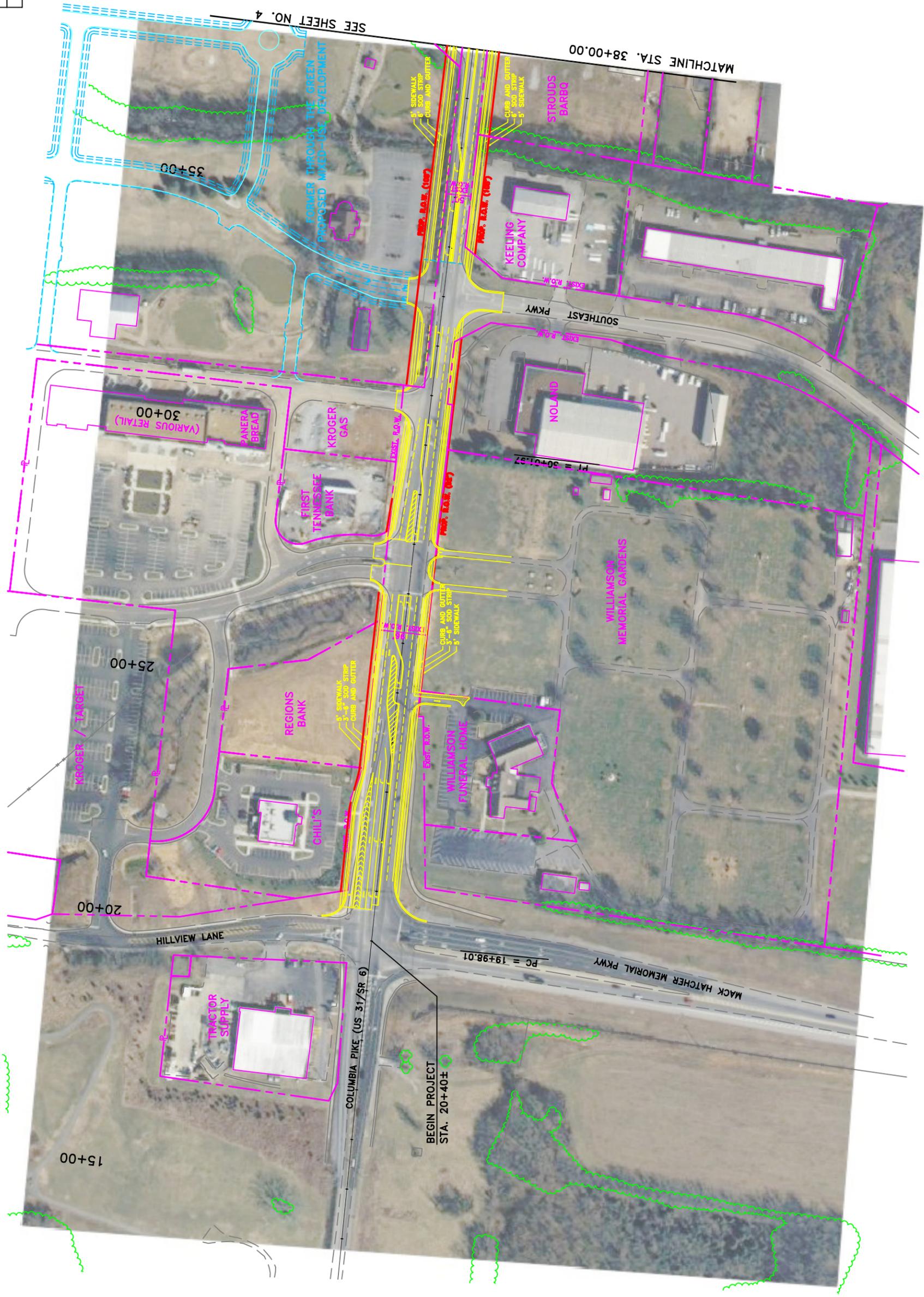
NOT TO SCALE

| | | | |
|-------|------|-------------|-----------|
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
| FUNC. | 07 | 612 | 3 |
| | | | |
| | | | |

THE CITY OF
FRANKLIN

SEI SULLIVAN ENGINEERING, INC.
SULLIVAN ENGINEERING, INC.
1000 PARKWAY SOUTH
MEMPHIS, TENNESSEE 38117

COLUMBIA PIKE
(U.S. 31 / S.R. 6)
FUNCTIONAL LAYOUT
BEGIN PROJECT TO
STA. 38+00.00
SCALE: 1"=100'



SEE SHEET NO. 4

MATCHLINE STA. 38+00.00

15+00

20+00

25+00

30+00

35+00

COLUMBIA PIKE (US 31/SR 6)

BEGIN PROJECT
STA. 20+40±

PC = 19+98.01

PI = 30+01.97

MACK HATCHER MEMORIAL PKWY

SOUTHEAST PKWY

FOSTER THROUGH THE GREEN
PROPOSED MIXED-USE DEVELOPMENT

TRACTOR SUPPLY

REGIONS BANK

FIRST TENNESSEE BANK

KROGER GAS

PANERA BREAD

WILLIAMSON
MEMORIAL HOME

WILLIAMSON
MEMORIAL GARDENS

NOLAND

KEELING COMPANY

STROLIDS BARBE

5' SIDEWALK
6' CURB AND GUTTER

5' SIDEWALK
8' CURB AND GUTTER

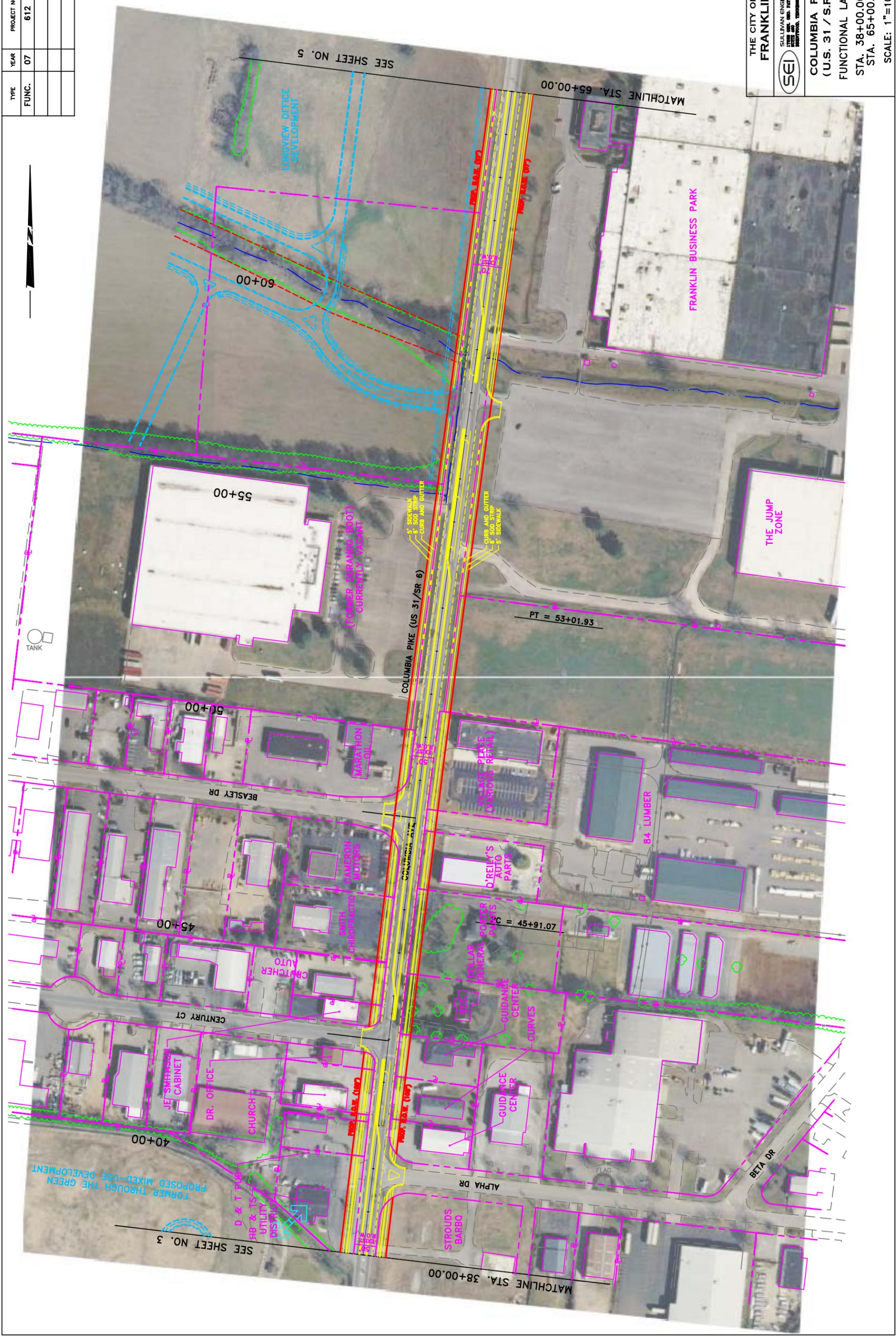
5' SIDEWALK
8' CURB AND GUTTER

| | | | |
|-----------|-------------|------|-------|
| SHEET NO. | PROJECT NO. | YEAR | TYPE |
| 4 | 612 | 07 | FUNC. |
| | | | |
| | | | |

THE CITY OF
FRANKLIN

SEI
SULLIVAN ENGINEERING, INC.
CIVIL, MECHANICAL, ELECTRICAL, PLUMBING, ENERGY

**COLUMBIA PIKE
(U.S. 31 / S.R. 6)**
FUNCTIONAL LAYOUT
STA. 38+00.00 TO
STA. 65+00.00
SCALE: 1"=100'



SEE SHEET NO. 3

MATCHLINE STA. 38+00.00

FORMER MIXED-USE DEVELOPMENT

40+00

45+00

50+00

55+00

60+00

40+00

45+00

50+00

55+00

60+00

SEE SHEET NO. 5

PT = 53+01.93

MATCHLINE STA. 65+00.00

| | | | |
|-------|------|-------------|-----------|
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
| FUNC. | 07 | 612 | 5 |
| | | | |
| | | | |

REV. 11-07-08: REMOVED REFERENCES TO MULTIPLE OPTIONS.

THE CITY OF
FRANKLIN

SULLIVAN ENGINEERING, INC.
STATE LICENSE NO. 00000000000000000000
REGISTERED PROFESSIONAL ENGINEERS

SEI

COLUMBIA PIKE
(U.S. 31 / S.R. 6)
FUNCTIONAL LAYOUT
STA. 65+00.00 TO
END PROJECT
SCALE: 1"=100'



SEE SHEET NO. 4

MATCHLINE STA. 65+00.00