

**APPLICANT PRESENTATION MATERIALS
PREMIER CENTER LUXURY APARTMENTS
CONDITIONAL USE APPLICATION #2020-601**

ATTACHMENTS

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☎ 484.866.4856

EDUCATION

B.S., Civil Engineering, 1999,
The Pennsylvania State University

PROFESSIONAL REGISTRATION

Professional Engineer
Pennsylvania, 2004, PE059925

KEVIN P. MARKELL, PE

Department Head, Civil Engineering

INTRODUCTION

Kevin Markell joined the Civil Engineering Department of Barry Isett & Associates, Inc. at the Lehigh Valley headquarters in 2000 and was named department manager in 2010. He oversees the activities of a staff of 18 and has managed and participated in the design of projects for educational institutions, commercial enterprises and residential and industrial developers in our Hazleton, Mechanicsburg, Allentown, Wilkes-Barre and Phoenixville offices. A company shareholder, he has also provided municipal plan reviews. Mr. Markell has particular understanding of stormwater and NPDES requirements and has conducted seminars on the topic for Isett clients and associates.

EXPERIENCE

Air Products & Chemicals World Headquarters, Upper Macungie Township, Lehigh County, PA – Mr. Markell has been the civil engineering project manager or supervisor on a number of projects at the campus headquarters. These include the design of stormwater management improvements to the main entrance of Building II, parking lot improvements and a feasibility review of undeveloped land for zoning compliance. He is the civil engineering project manager in design of the company's new world headquarters on a 50-acre site on Mill Creek Road. The campus features a 500,000 SF office building, a two-story 100,000 SF research and development center, a central utility plant, and a multi-story parking structure. The campus has a main entrance, a secondary access, and a service entrance. The project required roadway improvements to provide for new turning and stacking lanes in the immediate roadway network as well as traffic signal timing modifications at several other intersections.

Integrated Health Campus, Upper Macungie & South Whitehall Townships, Lehigh County, PA – Mr. Markell was the civil engineering project manager in the site design of a 30-acre campus that straddles two municipalities. The complex includes two medical office buildings (65,000 SF and 235,000 SF), with an imaging center, an aquatic center with a full-size Olympic pool, an ambulatory surgery center and a human performance center. Isett's design included associated parking, driveway access, and landscaping. Isett also provided stormwater management design & coordination of public utilities. As part of the site access portion of the project, Isett performed hydraulic modeling of the existing watercourse and determined appropriate size for culvert crossing.

Hamilton Court, South Whitehall Township, Lehigh County, PA – Mr. Markell was the civil engineering project manager for the design and construction of two 35,000 SF, two-story office buildings and parking facilities located along Hamilton Boulevard (Route 222), northeast of the Cedar Crest Boulevard intersection. Isett's services included boundary and topographic surveys, site engineering and land development, landscaping design, lighting design, stormwater management design, and NPDES & Highway Occupancy permitting.



Daniels Cadillac/BMW, South Whitehall Township, Lehigh County, PA – Mr. Markell was a site/civil project engineer in the redevelopment of a former truck dealership site into a high-end car dealership. The project began with a property condition assessment of the existing facilities, which included a building of about 20,000 square feet. After providing a boundary and topographic survey, Isett subdivided the 11-acre site into three parcels and provided site development services for a 26,000 SF addition featuring a showroom, offices, and parts department. The facility includes 28 service bays. Isett later provided subsequent design for an expansion of the project to provide space on the site for Daniels Mini Cooper Dealership.

Boulder Business Center, Lots 3A, 3B and 5B, Upper Macungie Township, Lehigh County, PA – Mr. Markell was a project engineer in the design of a 120,000 SF building, a 300,000 SF building, and a one million SF building on Lots 3A, 3B and 5B. He assisted with site layout, stormwater piping design, lighting design and landscape design.

Liberty at Mill Creek, Upper & Lower Macungie Townships, Lehigh County, PA – Over two million SF of industrial buildings are now located on a 200-acre parcel that spans both Upper and Lower Macungie Townships. Mr. Markell was the civil engineering project manager in this complex project that required extensive roadway improvements for three existing local roads, the Route 222 Bypass and the design and construction of a new connector road.

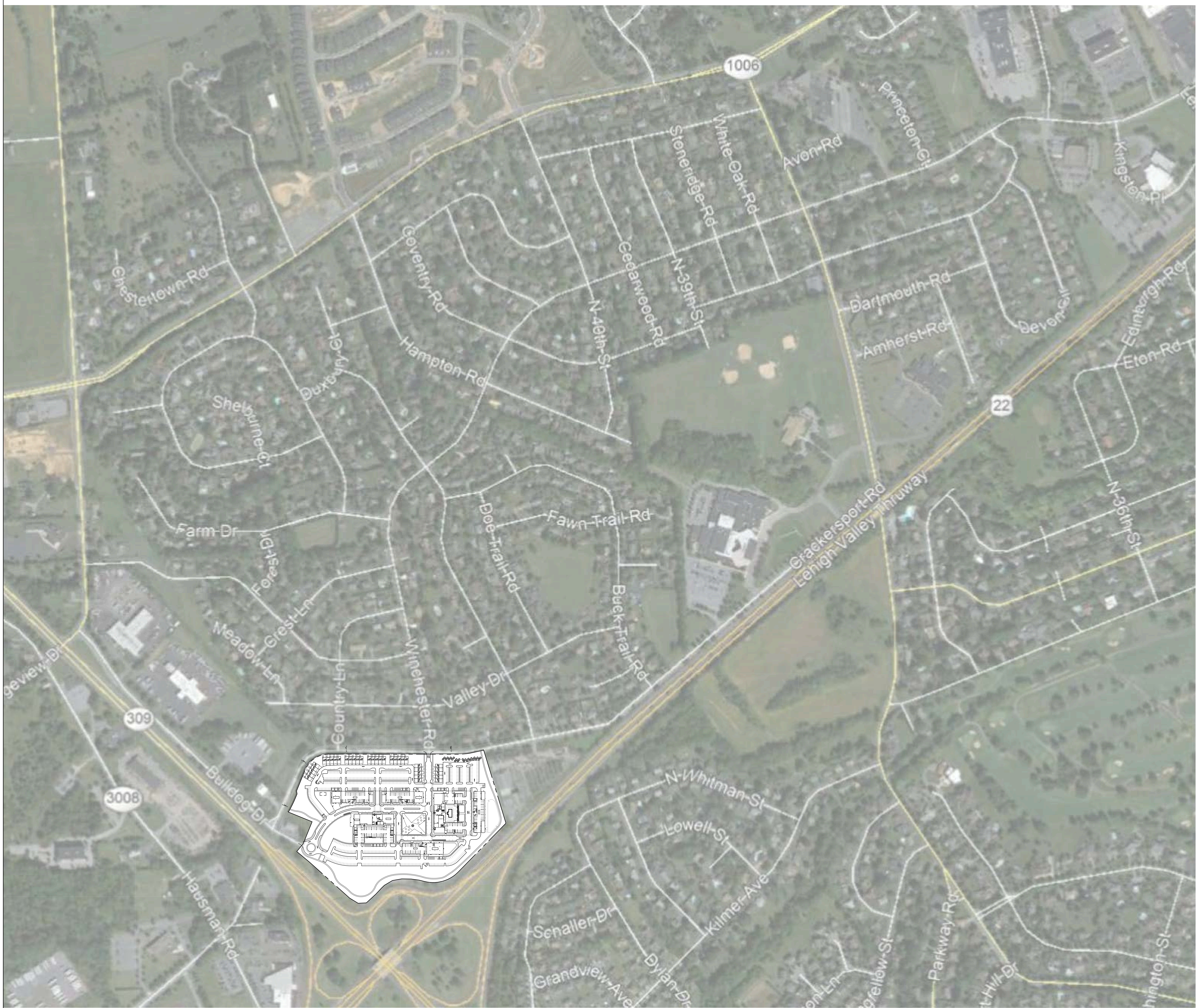
Iron Run Industrial Park, Lot 63, Upper Macungie Township, Lehigh County, PA – The site was developed for a 22,000 SF office building and associated parking. Multiple rain gardens and underground infiltration beds were included as part of the stormwater design. Mr. Markell was the engineering project manager.

Olympus Data Center Warehouse, Upper Macungie Township, Lehigh County, PA – Mr. Markell was the civil engineering project manager in the design of site modifications to an existing building to meet the needs of the new building tenant. Modifications included parking lot revisions and fire lane upgrades.

Packaging Corporation of America, Upper Macungie Township, Lehigh County, PA – The Lehigh Valley plant of one of America's largest producer of containerboard and corrugated packaging products was experiencing drainage issues in the rear shipping and parking area. Mr. Markell was the project manager in the design of drainage and pavement repairs.

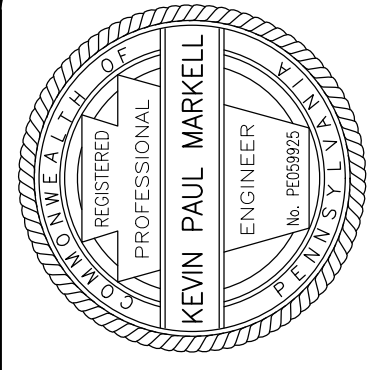
Bennett Jaguar/Land Rover Dealership, Upper Macungie Township, Lehigh County, PA – Mr. Markell was a member of the civil engineering team in the design of a new, luxury car dealership on a 10-acre site. The project involved the relocation of an existing roadway; improvements to the state highway that bounded the site; and new traffic signalization.

Griffin Industrial Realty, Lot 5, Iron Run Industrial Park, Upper Macungie Township, Lehigh County, PA – Mr. Markell was the civil engineering project manager in the design and permitting of a 134,000 SF, one-story office, and distribution center. Services included land development approvals and NPDES permitting, which proposed a spray irrigation system for stormwater management controls.



ZONING DATA:	
DISTRICT:	HC - HIGHWAY COMMERCIAL
MIN. LOT AREA:	1 ACRE
MIN. LOT FRONTAGE:	200 FT.
MIN. FRONT YARD:	50 FT.
MIN. SIDE YARD:	25 FT.
MIN. REAR YARD:	25 FT.
MAX. BUILDING HEIGHT:	35 FT.
SITE DATA:	
OWNER/APPLICANT:	E & B HOTEL PARTNERSHIP LP
OWNER ADDRESS:	1151 BULLDOG DRIVE ALLENTOWN, PA 18104
PROPERTY ADDRESS:	1151 BULLDOG DRIVE ALLENTOWN, PA 18104
RECORDING REFERENCE:	INSTRUMENT NO. 2010034053
PARCEL ID:	047669395077
ZONING:	HC - HIGHWAY COMMERCIAL
SEWER:	PUBLIC
WATER:	PUBLIC
EXISTING LOT AREA:	23.55 ACRES
N/AS TO BE DEDICATED:	0.17 ACRES
PROPOSED LOT AREA:	23.38 ACRES

REVISIONS	DATE	BY



610.388.0804
 barryselt.com
 85 South Route 100
 Allentown, PA 18106

BARRY & associates
 ARCHITECTS, ENGINEERS AND CONSULTANTS

AERIAL MAP EXHIBIT
 PREMIER CENTER LUXURY APARTMENTS
 E&B HOTEL PARTNERSHIP, LP
 SOUTH WHITEHALL TOWNSHIP
 LEHIGH COUNTY, PA

DATE:	3/23/2021	DSGN:	KPM
SCALE:	1"=200'	CHK:	KPM
DRAWN:	JAZ	APPRO:	KPM
JOB:	1015920.000	P MGR:	KPM
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SHEET: 1 OF 1			

SURVEY PLAN NOTES:

1. A WETLANDS PRESENCE/ABSENCE FIELD INVESTIGATION CONDUCTED ON MARCH 9, 2020 CONFIRMS THE ABSENCE OF ANY WETLAND AREAS WITHIN THE PROPERTY LIMITS.
2. THIS SURVEY WAS PREPARED WITH THE BENEFIT OF A TITLE REPORT DATED MARCH 9, 2020 PREPARED BY ELAIN YOUNG ABSTRACT. FLOTTABLE CONDITIONS AND EXCEPTIONS LISTED IN THE REPORT THAT AFFECT THE SUBJECT PREMISES SUCH AS EASEMENTS, RIGHTS OF WAYS, RESTRICTIONS, ETC. ARE PLOTTED AND SHOWN HEREON.
3. ANY DISCREPANCIES IN RECONCILIATION OF RECORD INFORMATION WITH FIELD MEASUREMENTS SHOWN ON THIS SURVEY ARE DUE TO THE PROFESSIONAL EVALUATION OF SEVERAL FACTORS INCLUDING, BUT NOT LIMITED TO: DEED CALLS, LOCATION OF CORNER MONUMENTATION, LOCATIONS OF LONG STANDING POSSESSION LINES OR OTHER BOUNDARY LINE EVIDENCE, CANTYWAY LOCATIONS (ROADS), WIDTH OF ORIGINAL SURVEY, SENIORITY OF TITLE, AND ERROR IN RECORD MEASUREMENTS AND/OR CLOSURES.
4. THE ZONING DATA PROVIDED IS BASED ON AN INTERPRETATION OF THE ZONING ORDINANCE BY THE PLAN PREPARER AND IS SUBJECT TO CONFIRMATION BY THE APPROPRIATE MUNICIPAL OFFICIAL.
5. BY GEOGRAPHIC PLOTTING ONLY IN ACCORDANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP, MAP NUMBER 42072021F, BEARING AN EFFECTIVE DATE OF JULY 16, 2004, THE SUBJECT PROPERTY IS LOCATED IN UNSHADED ZONE X, AN AREA OF MINIMAL FLOOD HAZARD.
6. THESE DRAWINGS HAVE BEEN PREPARED BASED ON THE BEST AVAILABLE INFORMATION. THE SURVEYOR HAS NOT VERIFIED THE ACCURACY OF THE UNDERGROUND UTILITIES AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.
7. THE LOCATION OF THE UTILITIES SHOWN HEREON WERE DETERMINED FROM OBSERVATION ONLY OF ABOVE GROUND IMPROVEMENTS, AND RECORDS PROVIDED TO THE SURVEYOR.
8. OBSERVED ABOVE GROUND EVIDENCE AND AVAILABLE RECORDS WERE UTILIZED TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EDUCATION AND/OR A SUBSURFACE UTILITY MAPPING STUDY, THE EXACT LOCATION OF UNDERGROUND FACILITIES CANNOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE PLAN USER IS ADVISED THAT EXCAVATION AND/OR A SUBSURFACE UTILITY MAPPING STUDY MAY BE NECESSARY.
9. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A SUBSURFACE UTILITY MAPPING STUDY AND THE LOCATIONS OF THE SUBSURFACE UTILITIES SHOWN HEREON ARE SUBJECT TO ANY AND ALL REVISIONS THAT A SUBSURFACE UTILITY MAPPING STUDY MIGHT REVEAL. THE SURVEY HAS REVEALED VARIOUS UNKNOWN REGARDING UTILITY LOCATIONS AND CONTRACTORS UTILIZING THESE PLANS ARE ADVISED TO PERFORM SUBSURFACE UTILITY MAPPING PRIOR TO CONSTRUCTION.
10. THE SUBJECT PROPERTY HAS DIRECT VEHICULAR ACCESS TO PUBLIC STREETS- BULLDOG DRIVE AND CRACKERSPORT ROAD.
11. THE BASIS OF BEARING FOR THE SUBJECT SURVEY IS THE PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - SOUTH ZONE.
12. THE PROPERTY SHOWN HEREON IS THE SAME PROPERTY AS DESCRIBED IN INSTRUMENT NO. 2010034003.
13. ADDITIONAL TOPOGRAPHIC FEATURES SHOWN OUTSIDE OF THE LIMIT OF SURVEY ARE FROM AERIAL IMAGERY AND OBSERVATIONS BY BIA DURING THE FIELD TOPOGRAPHIC SURVEY.

BENCHMARK:

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SURVEY CONTROL STATION E171, PROJECT SR 0309-14M, A BRASS DISK IN A CONCRETE MONUMENT LOCATED ON THE WEST SIDE OF BULLDOG DRIVE, APPROXIMATELY 1360 FEET SOUTH OF THE INTERSECTION OF BULLDOG DRIVE AND RIDGEVIEW ROAD AND 52.4 FEET EAST OF THE CENTERLINE OF NORTHBOUND LANE OF GROSS, 39.3 FEET SOUTH OF THE SOUTH END OF CONCRETE JERSEY BARRIER LOCATED ON THE WEST SIDE OF BULLDOG DRIVE, 5.8 FEET EAST OF THE GROSS RIGHT-OF-WAY FENCE. ELEVATION 433.29, NAVD 88 DATUM.

SITE DATA:

RECORD OWNER:
OWNER ADDRESS:
PROPERTY ADDRESS:
INSTRUMENT NO. 2010034003
RECORDING REFERENCE:
PARCEL ID:
ZONING:
SEWER:
WATER:
AREA:

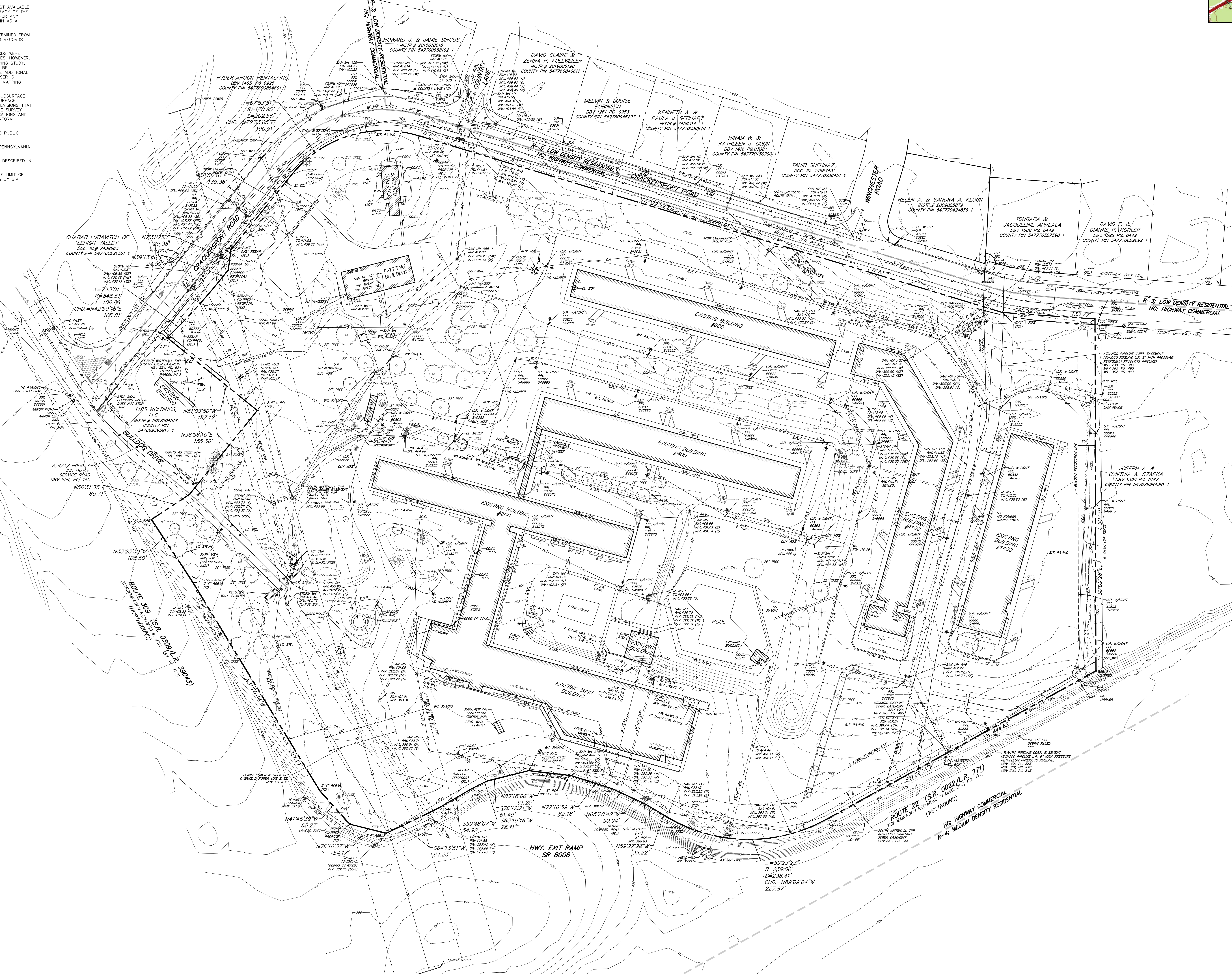
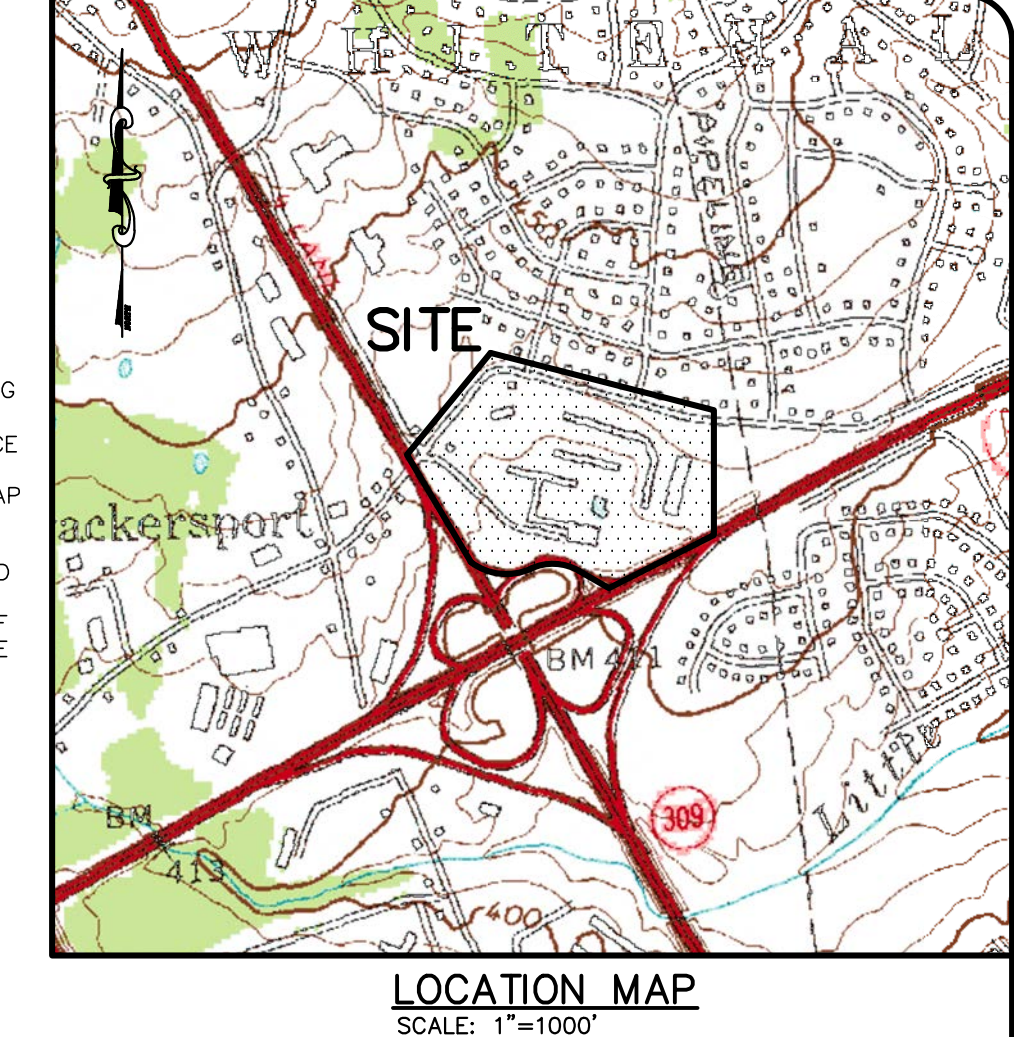
E & B HOTEL PARTNERSHIP LP
1151 BULLDOG DRIVE
ALLENTOWN, PA 18104-1999
1151 BULLDOG DRIVE
ALLENTOWN, PA 18104
HC - HIGHWAY COMMERCIAL
PUBLIC
23.55 ACRES

HOTEL CAPACITY INFORMATION

HOTEL - 285 ROOMS
BALLROOM - 1,200 PERSON SEATING CAPACITY
RESTAURANT - 200 PERSON SEATING CAPACITY
BIRCH MEETING ROOM - 60 PERSON CAPACITY
MAPLE MEETING ROOM - 40 PERSON CAPACITY
OAK MEETING ROOM - 15 PERSON CAPACITY
EVERGREEN ROOM - 15 PERSON CAPACITY
SPRUCE ROOM - 30 PERSON CAPACITY

PLAN REFERENCES:

1. SUBDIVISION PLAN OF PROPERTY OF B & C MOTEL CORPORATION, PREPARED BY MARTIN SHULER COMPANY, DATED JANUARY 15, 1964, RECORDED IN THE OFFICE OF THE RECORDER OF DEEDS IN AND FOR LEHIGH COUNTY, PA, IN MAJOR SUBDIVISION VOLUME 7, PAGE 69.
2. PLAN OF SECTION NO. 1, PARKLAND FARMS, PREPARED BY SAMUEL F. SHREVEAN, INC. DATED JULY 1968, RECORDED IN THE OFFICE OF THE RECORDER OF DEEDS IN AND FOR LEHIGH COUNTY, PA, IN MAJOR SUBDIVISION VOLUME 8, PAGE 48.
3. COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION DRAWINGS RE-ESTABLISHING LIMITED ACCESS HIGHWAY AND AUTHORIZING CONCERNATION OF RIGHT OF WAY OF STATE ROUTE 771 SECTION 007 R/W, PREPARED BY BERGER ASSOCIATES, INC., RECORDED IN THE OFFICE OF THE RECORDER OF DEEDS IN AND FOR LEHIGH COUNTY, PA, IN HIGHWAY MAP 167, FKA MAP RACK 18 AND HIGHWAY MAP 168, FKA MAP RACK 23.
4. PRELIMINARY - FINAL SUBDIVISION PLAN, MACK TRUCKS, INC. PREPARED BY F & M ASSOCIATES, INC. DATED MARCH 16, 1987, LATEST REVISION DATED APRIL 15, 1987, RECORDED IN THE OFFICE OF THE RECORDER OF DEEDS IN AND FOR LEHIGH COUNTY, PA, IN MINOR SUBDIVISION VOLUME 8, PAGE 319.
5. PLAN SHOWING LAND TITLE SURVEY FOR DAYS INN, PREPARED BY KEYSTONE CONSULTING ENGINEERS, DATED AUGUST 9, 1993, LATEST REVISION DATED SEPTEMBER 22, 1997.



LEGEND

PROPERTY BOUNDARY	---
LOT LINE	---
BUILDING SETBACK	---
LEGAL RIGHT-OF-WAY	---
EASEMENT	---
CURBING	---
BUILDING	---
LIGHT STANDARD	---
POLE + LIGHT	---
UTILITY POLE	---
OVERHEAD WIRES	---
OVERHEAD ELECTRIC	---
WATER MAIN & VALVE	---
FIRE HYDRANT	---
GAS MAIN & VALVE	---
SEWERY LINE, MANHOLE, & CLEANOUT	---
STORM LINE, MANHOLE, & INLET	---
CHAIN-LINK FENCE	---
SIGN	---
DECIDUOUS TREE	---
EVERGREEN TREE	---
TREE/BRUSH AREAS	---
CONTOUR	---
SPOT ELEVATION	---
EDGE OF PAVEMENT	---
BITUMINOUS	---
TYPICAL	---
DOOR SILL	---

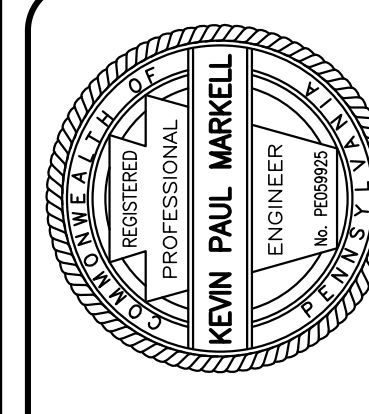


NOTE:
PURSUANT TO THE REQUIREMENTS OF PA ACT 287, AS AMENDED, ISETT CONTACTED ONE CALL, INC. FOR A DESIGN PHASE LOCATION REQUEST. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN DEVELOPED FROM EXISTING UTILITY RECORDS AND/OR ABOVE-GROUND EXAMINATIONS OF THE SITE. COMPLETENESS, ACCURACY, LOCATION AND DEPTH OF UNDERGROUND UTILITIES OR STRUCTURES CANNOT BE GUARANTEED. THE CONTRACTOR, AT LEAST THREE (3) DAYS PRIOR TO PERFORMING ANY EXCAVATIONS, SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS AND DEPTHS OF ALL UNDERGROUND FACILITIES LOCATED WITHIN THE VICINITY OF THE WORK SITE IN ACCORDANCE WITH ACT 121. (PA ONE CALL SYSTEM, INC. 1-800-342-9776)

THE SITE SERIAL NUMBER IS 20200632730, 20200632781, 20200632826, 20200632815, 20200632944.

NOTE: VERTICAL TEXT INDICATES PROPOSED FEATURES
SLANTED TEXT INDICATES EXISTING FEATURES
SCALE: 1"=50'

DATE:	11/19/2020
BY:	KPM
DESIGNER:	KPM
CHECKER:	KPM
APPROVED:	KPM
DRAWN:	JAX
PROJECT:	KPM
DATE:	10/15/2020
BY:	KPM
DESIGNER:	KPM
CHECKER:	KPM
APPROVED:	KPM
DRAWN:	JAX
PROJECT:	KPM



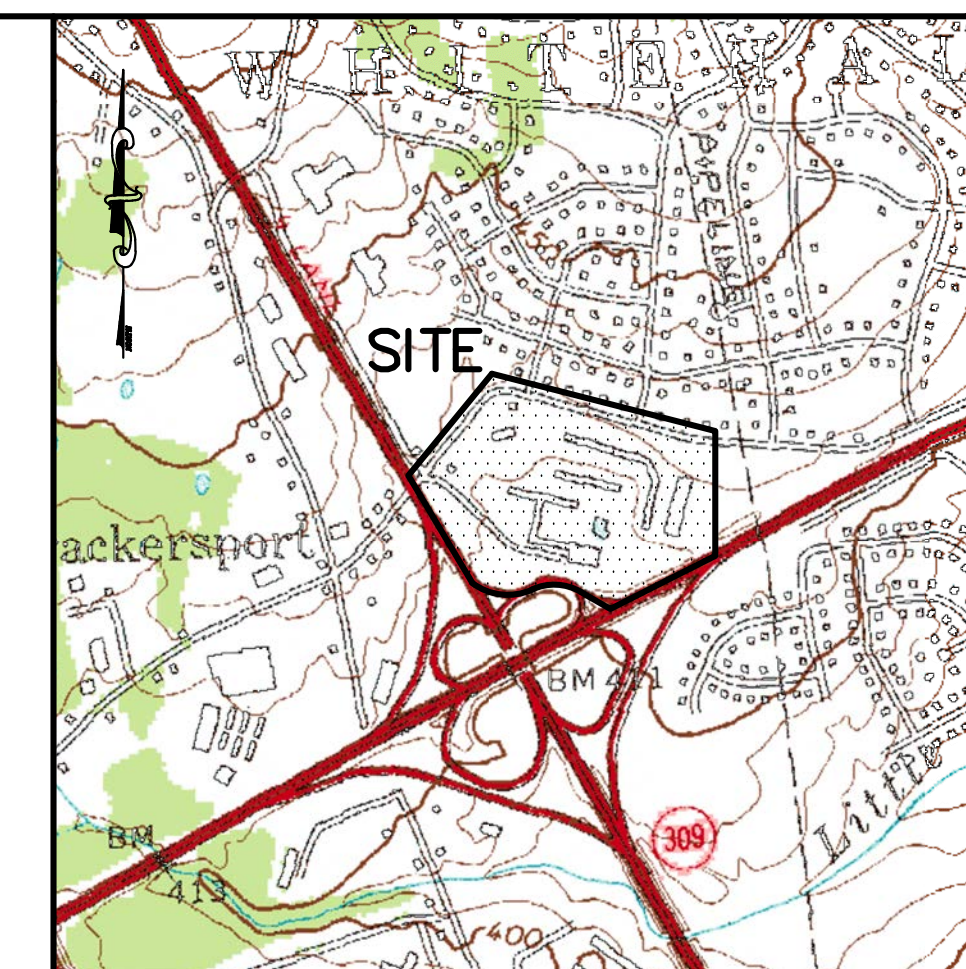
610.388.0904
barry@isett.com
85 South Route 100
Allentown, PA 18106

BARRY ISETT & ASSOCIATES
INCORPORATED
REGISTERED PROFESSIONAL ENGINEERS AND ARCHITECTS

EXISTING FEATURES PLAN
PREMIER CENTER LUXURY APARTMENTS
E&B HOTEL PARTNERSHIP, LP
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PA

DATE:	11/19/2020	DSGN:	KPM
SCALE:	1"=50'	CHK:	KPM
DRAWN:	JAX	APPRD:	KPM
PROJECT:	KPM	P MGR:	KPM
DATE:	10/15/2020	BY:	KPM
DESIGNER:	KPM	CHK:	KPM
APPROVED:	KPM	DRAWN:	JAX
PROJECT:	KPM	DATE:	10/15/2020
SHEET:	2 OF 5	COPYRIGHT:	2020

EF-1



DATE	BY
11/19/2020	JAZ
REVISIONS	COMMENTS
1. TYP REVIEW COMMENTS	
2. OWNER REVISIONS	

ZONING DATA:

DISTRICT:	HC - HIGHWAY COMMERCIAL
MIN. LOT AREA:	1 ACRE
MIN. LOT FRONTAGE:	200 FT.
MIN. FRONT YARD:	50 FT.
MIN. SIDE YARD:	50 FT.
MIN. REAR YARD:	25 FT.
MAX. BUILDING HEIGHT:	35 FT.

SITE DATA:

OWNER/APPLICANT: E & B HOTEL PARTNERSHIP LP
 OWNER ADDRESS: 1151 BULLDOG DRIVE, ALLENTOWN, PA 18104
 PROPERTY ADDRESS: 1151 BULLDOG DRIVE, ALLENTOWN, PA 18104
 RECORDING REFERENCE: INSTRUMENT NO. 2010034053
 PARCEL ID: 54766935917
 ZONING: HIGHWAY COMMERCIAL
 SEWER: PUBLIC
 WATER: PUBLIC
 EXISTING LOT AREA: 23.35 ACRES
 1/4 IN TO BE DEDICATED
 PROPOSED LOT AREA: 23.38 ACRES

RIGHT-OF-WAY DEDICATION
 PLAN PROPOSES 7.60% OF CRACKERSPORT ROAD RIGHT-OF-WAY TO BE DEDICATED TO THE TOWNSHIP.
CRACKERSPORT ROAD ACCESS
 TOWNHOMES WITH FRONTAGE ON BOTH CRACKERSPORT ROAD AND AN INTERNAL ROADWAY MUST TAKE ACCESS FROM THE INTERNAL ROADWAY.

NATURAL FEATURES
 THE SITES DO NOT CONTAIN ANY SIGNIFICANT TOPOGRAPHICAL AND/OR PHYSICAL FEATURES, SUCH AS FLOODPLAINS, WETLANDS, WATER CONSERVATION AREAS, STEEP SLOPES OR WOODLANDS.

PUBLIC FACILITIES
 ALL NECESSARY UTILITIES IN THE DEVELOPMENT WILL BE PRIVATELY OWNED & MAINTAINED. A PUBLIC SANITARY SEWER MAIN OWNED BY THE TOWNSHIP CURRENTLY RUNS THROUGH THE PROPERTY. PUBLIC WATER AND SEWER MAINS WILL BE EXTENDED THROUGH THE PROPERTY TO SERVE EACH OF THE BUILDINGS.

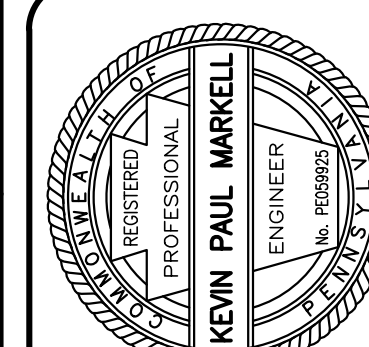
BUFFER YARD NOTE
 BUFFER YARDS SHOWN ON PLAN SHALL COMPLY WITH SECTION 550-21(F)(3)(i)(v) SUBSECTIONS (A) AND (B).

OPEN SPACE NOTE
 THE OPEN SPACE AND ACTIVE OPEN SPACE DEPICTED ON THE PLANS DO NOT CONTAIN ANY AREAS THAT CONSIST OF FLOODPLAINS OR WETLANDS. APPROXIMATELY 282,600 S.F. OF THE OPEN SPACE CONSISTS OF LAND IN EXCESS OF 25% SLOPES.
 THE OPEN SPACE AREAS WILL BE PRIVATELY OWNED AND MAINTAINED.

COMMERCIAL USES NOTE
 EACH COMMERCIAL USE WILL BE REQUIRED TO PULL OCCUPANCY PERMITS WITH THE TOWNSHIP IN ORDER TO DEMONSTRATE THEIR COMPLIANCE WITH THE UNDERLYING HC ZONING DISTRICT AS WELL AS APPLICABLE SPECIFIC USE REQUIREMENTS LISTED IN THE ZONING ORDINANCE.
 EACH COMMERCIAL USE WILL NEED TO HAVE PARKING REQUIREMENTS REVIEWED AT THE TIME OF OCCUPANCY PERMIT SUBMISSION BUT SHALL BE LIMITED BY CALCULATIONS SHOWN ON THIS PLAN.

OWNER/APPLICANT CERTIFICATION
 I, THE UNDERSIGNED, AM THE APPLICANT AND LEGAL OWNER OF THE LAND SHOWN HEREON. THE LAND IS NOT SUBJECT TO ANY LITIGATION OR LENS. THIS PLAN HAS BEEN PREPARED WITH FREE CONSENT.

NICK BIZAT, MEMBER
 E & B HOTEL PARTNERSHIP, LP



610.388.0904
 bary@bissett.com
 85 South Route 100
 Allentown, PA 18106

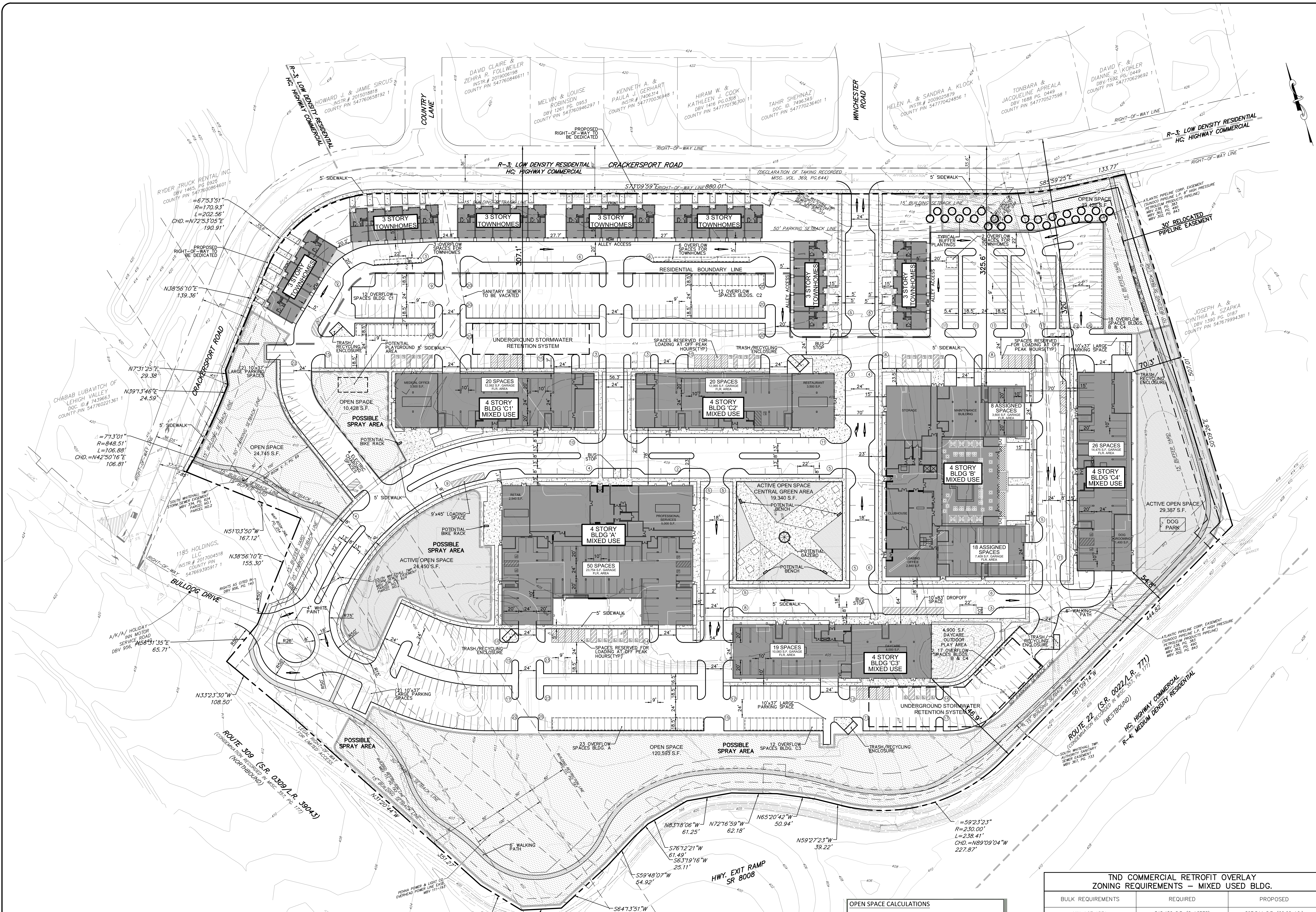
BARRY B I S E T T & associates
 ARCHITECTS, ENGINEERS AND CONSULTANTS

CONDITIONAL USE - SITE PLAN
 PREMIER CENTER LUXURY APARTMENTS
 E&B HOTEL PARTNERSHIP, LP
 SOUTH WHITEHALL TOWNSHIP
 LEHIGH COUNTY, PA

DATE: 11/19/2020
 SCALE: CHK
 DRAWN: JAZ
 JOB: 1015920.000
 SHEET: 3 OF 5

DSGN: KPM
 APPR: KPM
 PMGR: KPM
 COPYRIGHT 2020

CD-1



TND COMMERCIAL RETROFIT OVERLAY ZONING REQUIREMENTS - MIXED USED BLDG.

BULK REQUIREMENTS	REQUIRED	PROPOSED
MIN. LOT AREA	348,480 S.F. (8 ACRES)	897,544 S.F. (20.60 AC.)
MIN. LOT FRONTAGE	90 FT.	>1500 FT.
	MIN. BUILDING SETBACKS	
BUILDING SEPARATION	MIN. 20 FT.	MIN. 20 FT. (SEE PLAN)
BUILD TO LINE	MIN. 10 FT. / MAX. 15 FT.	MIN. 10 FT. / MAX. 15 FT.
SIDE (EA)	10 FT.	>10 FT.
REAR	20 FT.	>20 FT.
MAX. BLDG. HEIGHT	60 FT. (0' 300 FT. FROM LOT LINE)	<60 FT.
MAX. LOT COVERAGE	75%	61.7% (553,816 S.F.)

TND COMMERCIAL RETROFIT OVERLAY ZONING REQUIREMENTS - RESIDENTIAL

BULK REQUIREMENTS	REQUIRED	PROPOSED
MIN. LOT AREA	MIN. 10% / MAX. 25%	11.7% 120,968 S.F. (2.78 AC.)
MIN. LOT FRONTAGE	20 FT./UNIT	>20 FT.
MAX. DU/AC	15 DU/AC	12.6 DU/AC
	MIN. BUILDING SETBACKS	
BUILDING SEPARATION	MIN. 15 FT.	MIN. 15 FT. (SEE PLAN)
BUILD TO LINE	MIN. 10 FT. / MAX. 15 FT.	MIN. 10 FT. / MAX. 15 FT.
SIDE (EA)	15 FT.	>15 FT.
REAR	45 FT.	>45 FT.
MAX. BLDG. HEIGHT	35 FT.	MAX. 35 FT.
MAX. LOT COVERAGE	65%	61.8% (74,710 S.F.)

TND COMMERCIAL RETROFIT OVERLAY ZONING REQUIREMENTS - OVERALL

BULK REQUIREMENTS	REQUIRED	PROPOSED
MIN. LOT AREA	348,480 S.F. (8 ACRES)	1,018,512 S.F. (23.38 ACRES)
MIN. OPEN SPACE	15%	24.8% (252,269 S.F.)
MIN. ACTIVE OPEN SPACE	5%	7.2% (73,177 S.F.)
AREA OF RESIDENTIAL USE (EXCLUDES OPEN SPACE USE)	MIN. 10% / MAX. 25%	11.7% 119,115 S.F. (2.73 AC.)
MAX. LOT AREAS OF COMMERCIAL (EXCLUDES OPEN SPACE USE)	75%	63.35% 647,028 S.F. (14.85 AC.)

OPEN SPACE CALCULATIONS

- OPEN SPACE REQUIRED: 15% INCLUDES ACTIVE OPEN SPACE
- ACTIVE OPEN SPACE REQUIRED: 5%
- OPEN SPACE REQUIRED: 15% x 23.38 AC. = 3.51 AC. (152,765 S.F.)
- ACTIVE OPEN SPACE REQUIRED: 5% x 23.38 AC. = 1.17 AC. (50,922 S.F.)
- OPEN SPACE PROPOSED: 5.79 AC. (252,369 S.F.)
- ACTIVE OPEN SPACE PROPOSED: 1.68 AC. (73,177 S.F.)

- PARKING REQUIREMENTS**
- TOWNHOUSE: 2.25 SPACES PER UNIT
 - APARTMENTS: 2.25 SPACES PER UNIT PLUS 1 LARGE SPACE IN LOT WITH 50 SPACES
 - DAYCARE: 1 SPACE PER 500 SF PLUS 1 SPACE PER EMPLOYEE
 - MEDICAL OFFICE: 1 SPACE PER 200 SF
 - OPEN SPACE: 1 SPACE PER 0.1 ACRES
 - PERSONAL SERVICE BUSINESS: 1 SPACE PER 250 SF
 - DOG GROOMING (PET SHOP): 1 SPACE PER 200 SF
 - ST. DOWN RESTAURANT: 1 SPACE PER 80 SF PLUS 1 LARGE SPACE
 - RETAIL: 1 SPACE PER 200 SF
 - CLUBHOUSE/LEASING OFFICE: 1 SPACE PER 300 SF OF OFFICE SPACE FOR PUBLIC ASSEMBLY; 1 SPACE FOR EACH PERMANENT SEAT PLUS 1 SPACE PER 50 SF OF ADDITIONAL ROOMS USED FOR ASSEMBLY OF RESIDENTS & GUESTS, EXCLUDING LOBBIES, VESTIBULES & SIMILAR AREAS
 - MAINTENANCE BUILDING: 1 SPACE PER EMPLOYEE
 - 15% PARKING REDUCTION CAN BE APPLIED TO NON-RESIDENTIAL CALCULATIONS TOTAL

- PARKING CALCULATIONS RESIDENTIAL**
- TOWNHOUSE: 2.25 SPACES X 35 UNITS = 79 SPACES
 - TOTAL REQUIRED: 79 SPACES
- PARKING CALCULATIONS NON-RESIDENTIAL/COORDINATED DEVELOPMENT**
- APARTMENTS: 2.25 SPACES X 360 UNITS = 810 SPACES
 - DAYCARE: 1 SP/700SF X 8000 SF + 20 EMPLOYEES = 36 SPACES
 - DOG GROOMING: 1 SP/200SF X 1400 SF = 7 SPACES
 - MEDICAL OFFICE: 1 SP/200SF X 3500 SF = 18 SPACES
 - PERSONAL SERVICE BUSINESS: 1 SP/250SF X 5000 SF = 20 SPACES
 - ST. DOWN RESTAURANT: 1 SP/80SF X 8000SF = 44 SPACES
 - RETAIL: 1 SP/200SF X 2540 SF = 13 SPACES
 - CLUBHOUSE: 1 SP/300SF X 2,840SF = 10 SPACES
 - MAINTENANCE BUILDING: 1 SP/EMPLOYEE X 4 EMPLOYEE = 4 SPACES
 - ACTIVE OPEN SPACE: 15% X 163,126 S.F. = 25
 - TOTAL REQUIRED: 977 SPACES
 - TOTAL REQUIRED W/ 15% REDUCTION OF PARKING: 830 SPACES
 - TOTAL OVERALL PARKING REQUIRED: 909 SPACES (79 + 830)

- PARKING PROVIDED:**
- PARKING STRUCTURE (MIXED USE BLDGS): 343 SPACES
 - TOWNHOUSE GARAGES: 2 CAR PER GARAGE X 35 GARAGES = 70 SPACES
 - SURFACE PARKING: 488 SPACES
 - TOTAL PARKING PROVIDED: 811 SPACES
 - TOTAL PARKING PROVIDED - 811 SPACES
 - LARGE PARKING SPACES: 4 SPACES
 - ELECTRIC VEHICLE PARKING: 4 SPACES

OVERFLOW PARKING CALCULATIONS

BUILDING A: 25 SPACES X 90 UNITS = 225 SPACES
 BUILDING B: 25 SPACES X 90 UNITS = 225 SPACES
 BUILDING C1: 25 SPACES X 48 UNITS = 120 SPACES
 BUILDING C2: 25 SPACES X 48 UNITS = 120 SPACES
 BUILDING C3: 25 SPACES X 48 UNITS = 120 SPACES
 BUILDING C4: 25 SPACES X 48 UNITS = 120 SPACES
 TOWNHOMES: 25 SPACES X 35 UNITS = 875 SPACES

NOTE: OVERFLOW PARKING IS ALREADY INCLUDED IN THE TOTAL PARKING CALCULATIONS SHOWN. DELINEATED OVERFLOW PARKING SPACES ARE WITHIN 300 FEET OF EACH BUILDING.

SLANTED TEXT INDICATES EXISTING FEATURES
 VERTICAL TEXT INDICATES PROPOSED FEATURES

Spotts, Stevens and McCoy

Roma Corporate Center, Suite 106

1605 N. Cedar Crest Blvd. > Allentown PA 18104

610.849.9700 > F. 610.621.2001 > SSMGROUP.COM



December 16, 2020

Kevin Markell
Barry Isett and Associates, Inc.
85 South Rte. 100
Allentown PA 18106

Email: kmarkell@barryisett.com

Re: Bizate Park View Development
Conditional Use Water & Sewer Service
SSM File 103400.00

Dear Mr. Markell:

We are in receipt of your request to South Whitehall Township for correspondence on water and sewer service to the proposed redevelopment of the former Days Inn Hotel a.k.a. Bizate Park View in conjunction with a Conditional Use application to South Whitehall Township. We are responding on behalf of South Whitehall Township. The site is currently served by Township owned public water and sanitary sewer and the Township intends to serve the proposed redevelopment with water and sanitary sewer.

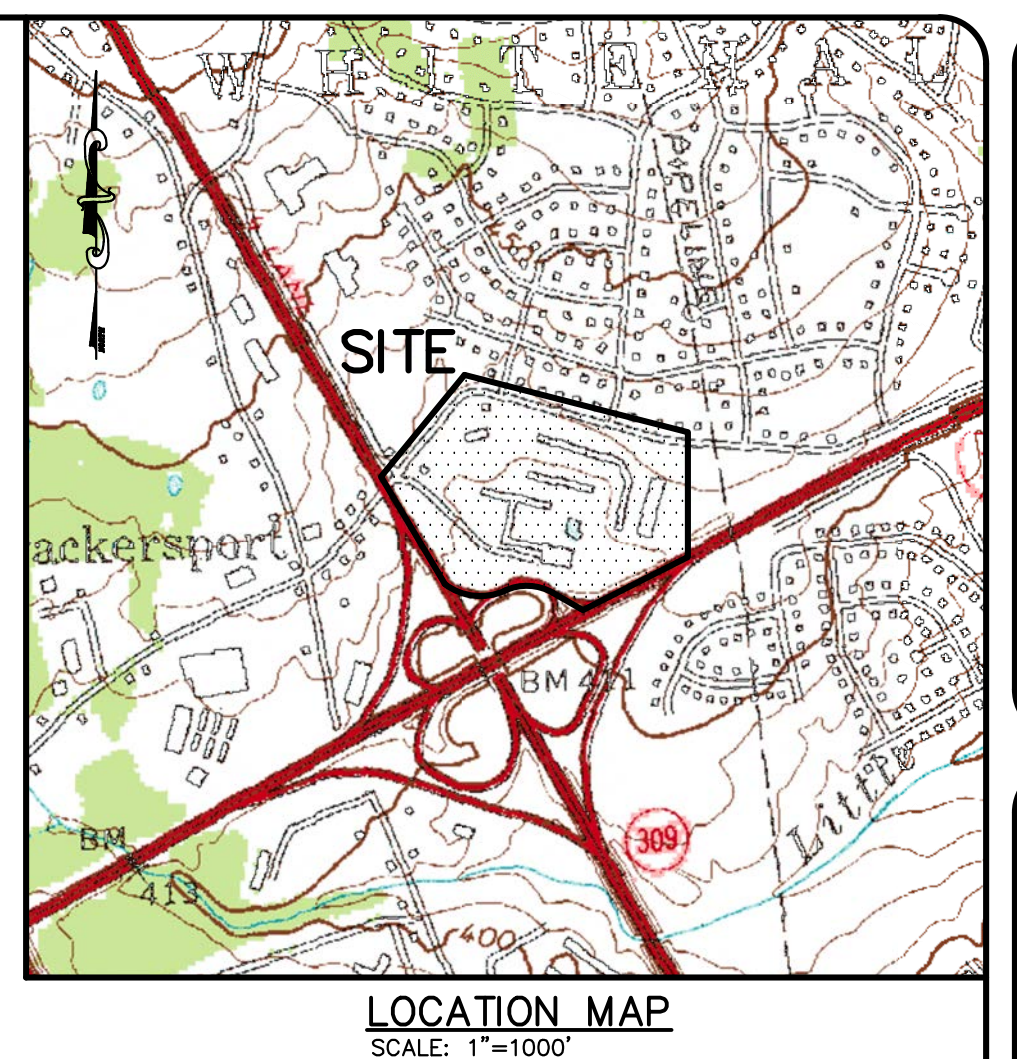
Please contact our office should you have any questions or comments.

Sincerely,
Spotts, Stevens and McCoy

A handwritten signature in blue ink that reads "Jason M. Newhard".

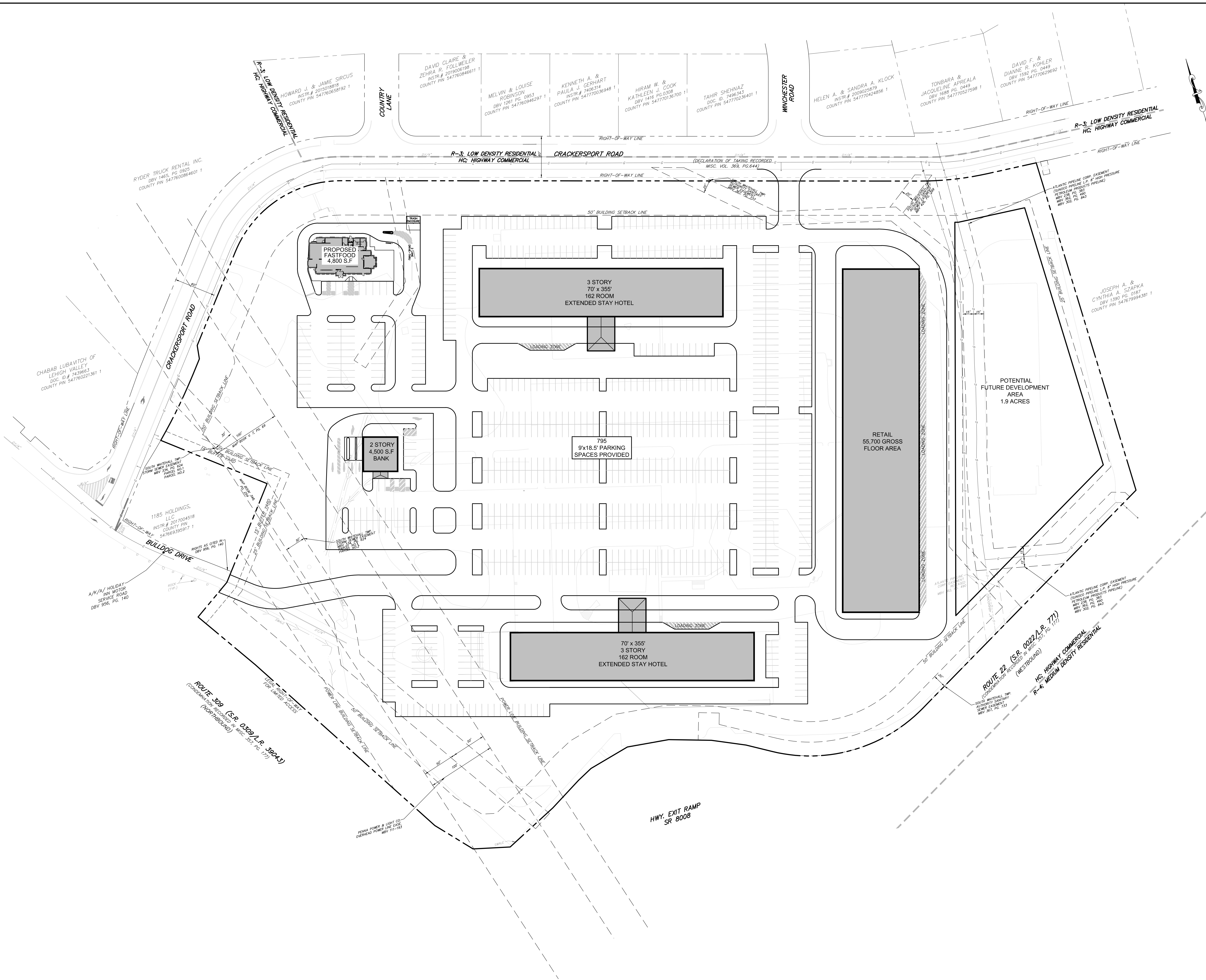
Jason M. Newhard, CMIT
Construction Services Administrator
Water and Wastewater Engineering
jason.newhard@ssmgroup.com

cc: SWT



HC - HIGHWAY COMMERCIAL		
BULK REQUIREMENTS	REQUIRED	PROPOSED
MIN. LOT AREA	43,560 S.F. (1 ACRE)	23.4 ACRES
MIN. LOT FRONTAGE	200 FT.	>1500 FT.
MIN. BUILDING SETBACKS		
BUILD TO LINE	50 FT.	>50 FT.
SIDE (EA.)	25 FT.	>25 FT.
REAR	25 FT.	>25 FT.
MAX. BLDG. HEIGHT	35 FT./50 FT.(EXTENDED STAY)	<35 FT. / <50 FT.
MAX. LOT COVERAGE	75%	11.85 AC.(50.6%)

- GENERAL PARKING REQUIREMENTS**
- FAST FOOD: 1 SPACE PER 100 S.F. OF TOTAL FLOOR AREA
 - RETAIL: 1 SPACE PER 200 GROSS FLOOR AREA
 - EXTENDED STAY HOTEL: 1 PER GUEST ROOM, 1 PER 100 S.F. OF MEETING SPACE
 - BANK: 1 SPACE PER 200 S.F.
- PARKING PROVIDED:**
- FAST FOOD: 4800 S.F. / 150 = 48 REQUIRED, 55 PROVIDED
 - RETAIL: 55,700 S.F. / 200 = 279 REQUIRED, 305 PROVIDED
 - EXTENDED STAY HOTEL: 1 PER 324 ROOMS = 400 / 100 MTG. SPACE = 364 REQUIRED, 405 PROVIDED
 - BANK: 4,500 S.F. / 200 = 23 SPACES, 30 PROVIDED



	AM PEAK	PM PEAK	DAILY
EXTENDED STAY HOTEL (324 ROOMS)	156	168	2022
FAST FOOD W/ DRIVE THRU (4,800 S.F.)	193	157	2262
RETAIL BUILDING (55,700 S.F.)	52	212	2104
BANK W/ DRIVE THRU (4,500 S.F.)	43	92	450
TOTAL	444	629	6838

LEGEND

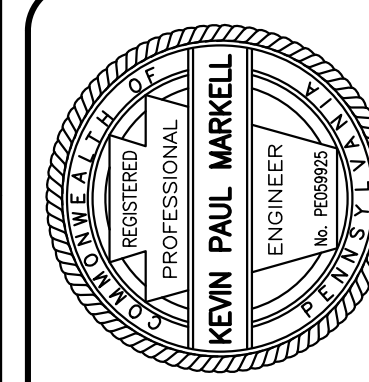
PROPERTY BOUNDARY	---
LOT LINE	---
BUILDING SETBACK	---
ULTIMATE RIGHT-OF-WAY	---
LEGAL RIGHT-OF-WAY	---
CASHEMENT	---
UTILITY POLE	○
OVERHEAD ELECTRIC	---
OVERHEAD TELEPHONE	---
OVERHEAD TELEVISION	---
UNDERGROUND ELECTRIC	---
UNDERGROUND TELEPHONE	---
UNDERGROUND TELEVISION	---
WATER MAIN & VALVE	○
FIRE HYDRANT	○
GAS MAIN & VALVE	○
SANITARY SEWER	○
STORMSEWER	○
CHAIN-LINK FENCE	---
SIGN	---
CONTOUR	---
SPOT ELEVATION	---
DOOR SILL	---
ELECTRIC	---
EDGE OF PAVEMENT	---
EDGE OF SHOULDER	---
CONCRETE	---
DEPRESSED CURB	---
BITUMINOUS	---
TYPICAL	---



NOTE:
 PURSUANT TO THE REQUIREMENTS OF PA ACT 287, AS AMENDED, ISETT CONTACTED ONE CALL, INC. FOR A DESIGN PHASE LOCATION REQUEST. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN DEVELOPED FROM EXISTING UTILITY RECORDS AND/OR ABOVE-GROUND EXAMINATIONS OF THE SITE. COMPLETENESS, ACCURACY, LOCATION AND DEPTH OF UNDERGROUND UTILITIES OR STRUCTURES CANNOT BE GUARANTEED. THE CONTRACTORS, AT LEAST THREE (3) DAYS PRIOR TO PERFORMING ANY EXCAVATIONS, SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS AND DEPTHS OF ALL UNDERGROUND FACILITIES LOCATED WITHIN THE VICINITY OF THE WORK SITE IN ACCORDANCE WITH ACT 121. (PA ONE CALL SYSTEM, INC. 1-800-342-8770.)

THE SITE SERIAL NUMBER IS 20200632730, 20200632781, 20200632826, 20200632815, 20200632944.

DATE	DATE
REVISIONS	REVISIONS



610.388.0904
 barry@isett.com
 85 South Route 100
 Allentown, PA 18106

ISETT & associates
 CIVIL ENGINEERS AND CONSULTANTS

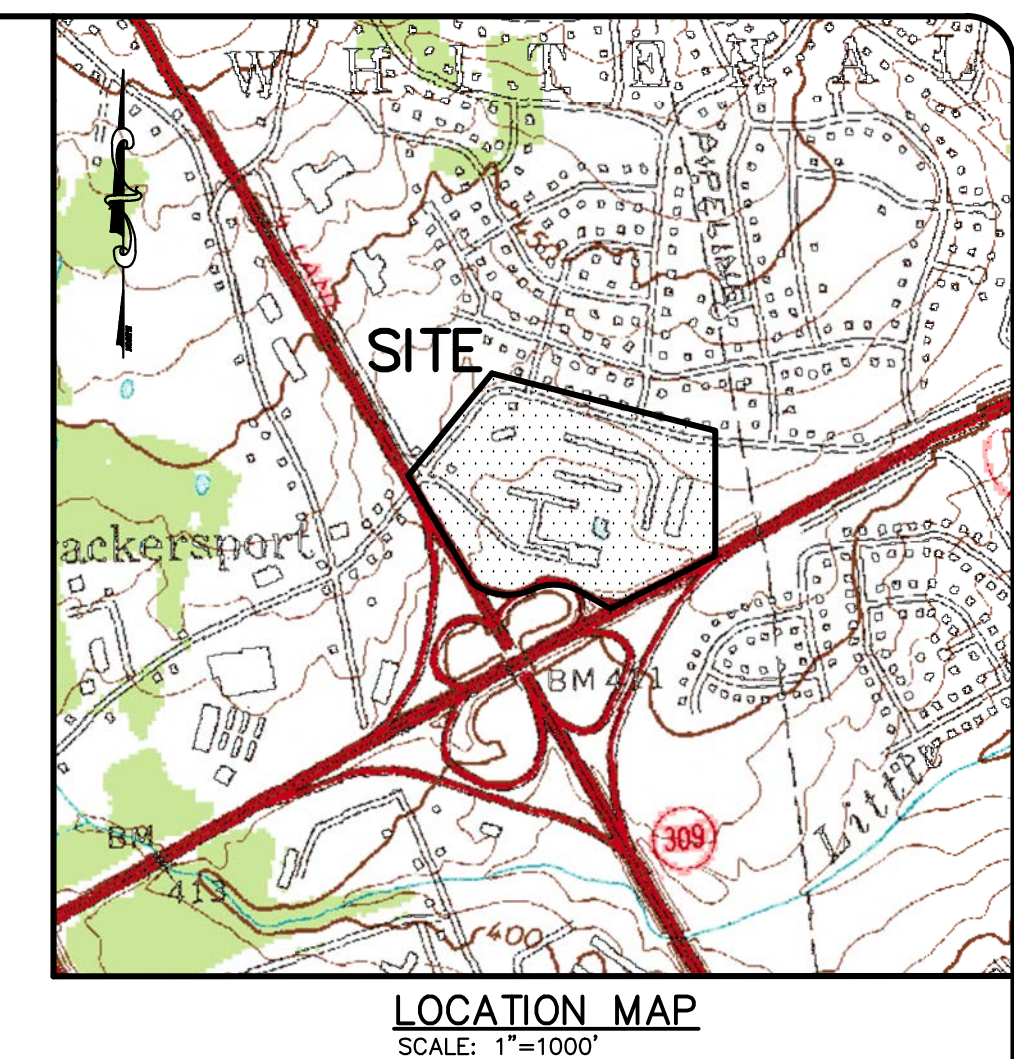
EXTENDED STAY HOTEL, FAST FOOD, RETAIL, BANK - OPTION 2

E&B HOTEL PARTNERSHIP, LP
 SOUTH WHITEHALL TOWNSHIP
 LEHIGH COUNTY, PA

DATE	DSGN
SCALE	CHK
DRAWN	APPR
JOB	P MGR
COPYRIGHT 2021	
SHEET: 1 OF 1	

SK-2

SCALE: 1"=50'



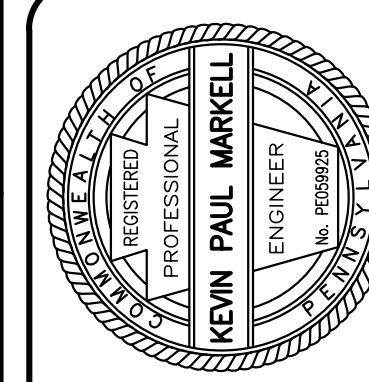
HC - HIGHWAY COMMERCIAL		
BULK REQUIREMENTS	REQUIRED	PROPOSED
MIN. LOT AREA	43,560 S.F. (1 ACRE)	23.4 ACRES
MIN. LOT FRONTAGE	200 FT.	>1500 FT.
MIN. BUILDING SETBACKS		
BUILD TO LINE	50 FT.	>50 FT.
SIDE (E.A.)	25 FT.	>25 FT.
REAR	25 FT.	>25 FT.
MAX. BLDG. HEIGHT	35 FT./50 FT.(EXTENDED STAY)	<35 FT. / <50 FT.
MAX. LOT COVERAGE	75%	12.5 ACRES(53.4%)

- GENERAL PARKING REQUIREMENTS**
- FASTFOOD: 1 SPACE PER 100 S.F. OF TOTAL FLOOR AREA
 - SHOPPING CENTER: 1 SPACE PER 225 S.F. GROSS FLOOR AREA
 - GENERAL OFFICE: 1 PER 300 S.F. OF USABLE OFFICE SPACE
 - BANK: 1 SPACE PER 200 S.F. OF FLOOR AREA
- PARKING PROVIDED:**
- FASTFOOD: 4800 S.F. / 100 = 48 REQUIRED, 55 PROVIDED
 - SHOPPING CENTER: 102,000 S.F. / 225 = 454 REQUIRED, 459 PROVIDED
 - GENERAL OFFICE: 86,000 S.F. / 300 = 287 REQUIRED, 287 PROVIDED
 - BANK: 2,500 S.F. / 200 = 13 REQUIRED, 17 PROVIDED

	AM PEAK	PM PEAK	DAILY
SHOPPING CENTER (102,000 S.F.)	96	389	3852
FAST FOOD W/ DRIVE THRU (4,800 S.F.)	193	157	2262
GENERAL OFFICE BUILDING (86,000 S.F.)	107	99	918
BANK W/ DRIVE THRU (2,500 S.F.)	24	51	250
TOTAL	420	696	7282

- LEGEND**
- PROPERTY BOUNDARY
 - LOT LINE
 - BUILDING SETBACK
 - ULTIMATE RIGHT-OF-WAY
 - LEGAL RIGHT-OF-WAY
 - EASEMENT
 - BUFFER YARD
 - UTILITY POLE
 - OVERHEAD ELECTRIC
 - OVERHEAD TELEPHONE
 - OVERHEAD TELEVISION
 - UNDERGROUND ELECTRIC
 - UNDERGROUND TELEPHONE
 - UNDERGROUND TELEVISION
 - WATER MAIN & VALVE
 - FIRE HYDRANT
 - GAS MAIN & VALVE
 - SANITARY SEWER
 - STORMSEWER
 - CHAIN-LINK FENCE
 - SIK
 - CONTOUR
 - SPOT ELEVATION
 - DOOR SILL
 - ELECTRIC
 - EDGE OF PAVEMENT
 - EDGE OF SHOULDER
 - CONCRETE
 - DEPRESSED CURB
 - BITUMENUS
 - TYPICAL

DATE	3/5/2021
BY	KPM
REVISIONS	



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barysett.com
85 South Route 100
Allentown, PA 18106



GENERAL OFFICE BUILDING, FAST FOOD, RETAIL, BANK - OPTION 3

E&B HOTEL PARTNERSHIP, LP
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PA

DATE	3/5/2021	DSGN	KPM
SCALE	1"=50'	CHK	KPM
DRAWN	JAZ	APPRO	KPM
JOB	1015920000	PMGR	KPM
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SHEET 1 OF 1			

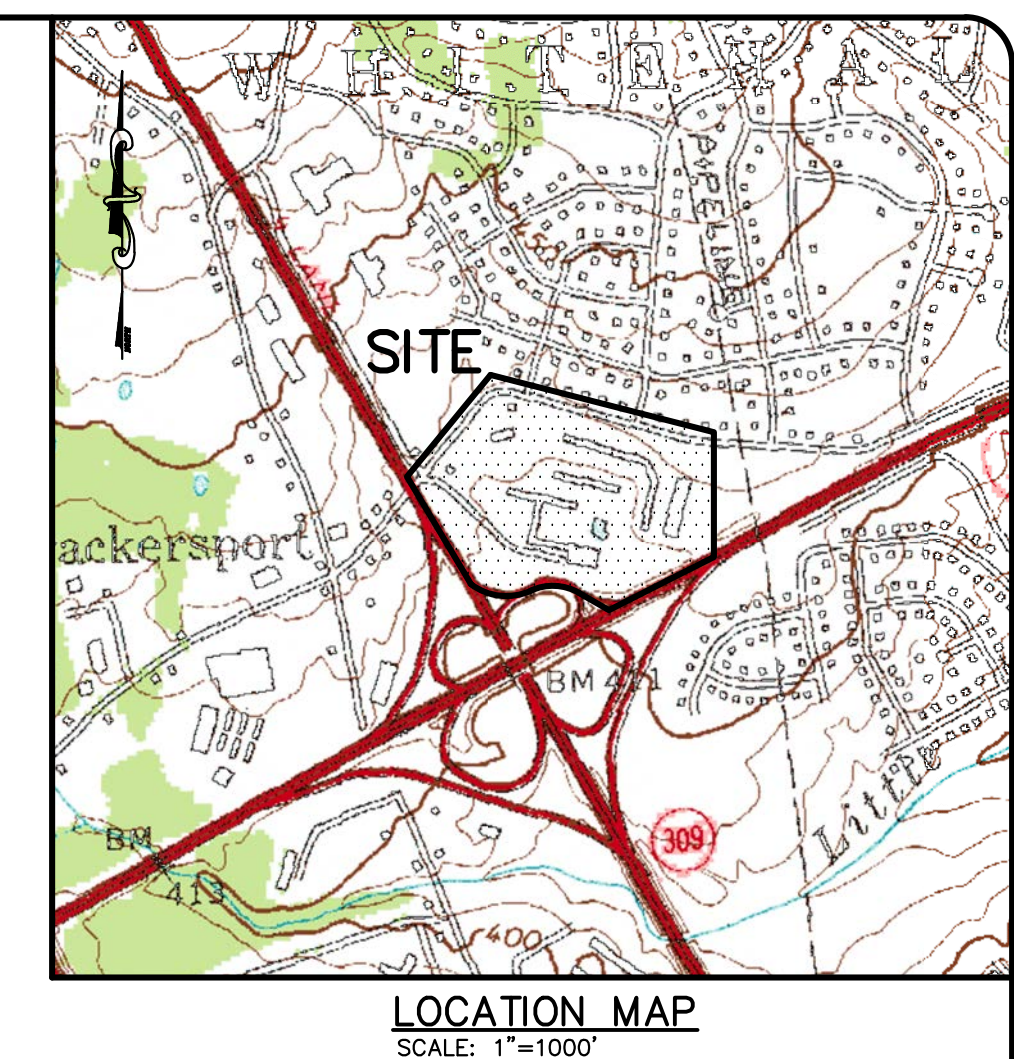
SK-3



NOTE:
PURSUANT TO THE REQUIREMENTS OF PA ACT 287, AS AMENDED, I/SETT CONTACTED ONE CALL, INC. FOR A DESIGN PHASE LOCATION REQUEST. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN DEVELOPED FROM EXISTING UTILITY RECORDS AND/OR ABOVE-GROUND EXAMINATIONS OF THE SITE. COMPLETENESS, ACCURACY, LOCATION AND DEPTH OF UNDERGROUND UTILITIES OR STRUCTURES CANNOT BE GUARANTEED. THE CONTRACTOR, AT LEAST THREE (3) DAYS PRIOR TO PERFORMING ANY EXCAVATIONS, SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS AND DEPTHS OF ALL UNDERGROUND FACILITIES LOCATED WITHIN THE VICINITY OF THE WORK SITE IN ACCORDANCE WITH ACT 121. (PA ONE CALL SYSTEM, INC. 1-800-342-7770.)

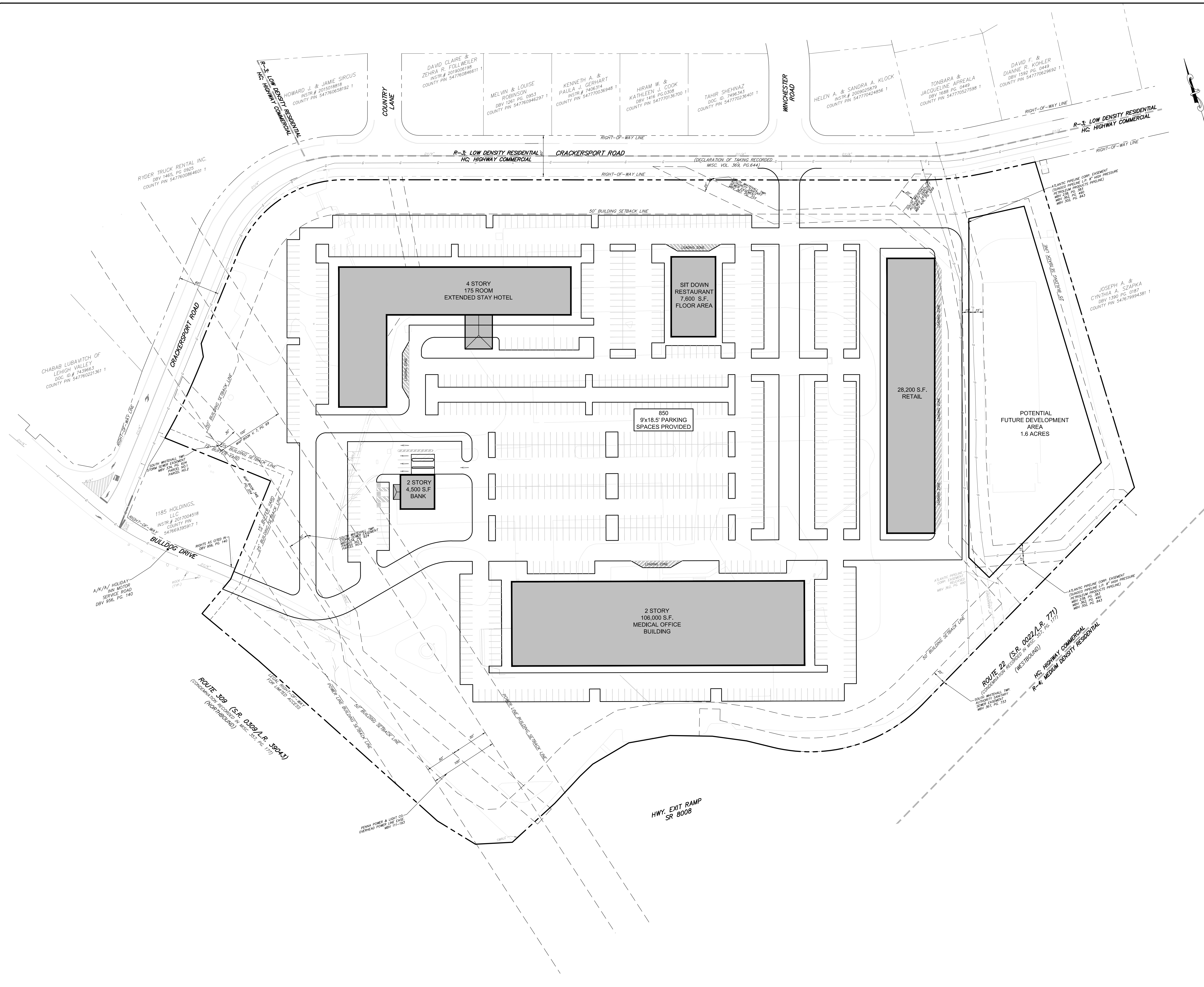
THE SITE SERIAL NUMBER IS 20200632730, 20200632781, 20200632826, 20200632915, 20200632944.

SCALE: 1"=50'



HC - HIGHWAY COMMERCIAL		
BULK REQUIREMENTS	REQUIRED	PROPOSED
MIN. LOT AREA	43,560 S.F. (1 ACRE)	23.4 ACRES
MIN. LOT FRONTAGE	200 FT.	>1500 FT.
MIN. BUILDING SETBACKS		
BUILD TO LINE	50 FT.	>50 FT.
SIDE (EA.)	25 FT.	>25 FT.
REAR	25 FT.	>25 FT.
MAX. BLDG. HEIGHT	35 FT./50 FT.(EXTENDED STAY)	<35 FT. / <50 FT.
MAX. LOT COVERAGE	75%	11.5 ACRES(49.1%)

- GENERAL PARKING REQUIREMENTS**
- RESTAURANT: 1 SPACE PER 80 S.F. OF TOTAL FLOOR AREA
 - RETAIL: 1 SPACE PER 200 GROSS FLOOR AREA
 - EXTENDED STAY HOTEL: 1 PER GUEST ROOM, 1 PER 100 S.F. OF MEETING SPACE
 - MEDICAL OFFICE: 1 PER 250 OF USABLE OFFICE AREA
 - BANK: 1 SPACE PER 200 S.F. OF FLOOR AREA
- PARKING PROVIDED:**
- RESTAURANT: 7500 S.F. / 80 - 95 REQUIRED, 95 PROVIDED
 - RETAIL: 28,200 S.F. / 200 - 141 REQUIRED, 141 PROVIDED
 - EXTENDED STAY HOTEL: 1 PER 175 ROOMS, 2000 / 1000 S.F. SPACE = 200 REQUIRED, 200 PROVIDED
 - MEDICAL OFFICE: 100,000 / 400 / 250 - 382 REQUIRED, 388 PROVIDED
 - BANK: 4,500 S.F. / 200 - 23 SPACES REQUIRED, 28 SPACES PROVIDED



	AM PEAK	PM PEAK	DAILY
EXTENDED STAY HOTEL (175 ROOMS)	84	91	1092
SIT DOWN RESTAURANT (7,600 S.F.)	76	74	854
RETAIL/COMMERCIAL BUILDING (28,200 S.F.)	27	107	1066
MEDICAL OFFICE BUILDING (106,000 S.F.)	235	361	3984
BANK W/ DRIVE THRU (4,500 S.F.)	43	92	450
TOTAL	465	725	7446

LEGEND

PROPERTY BOUNDARY	---
LOT LINE	---
BUILDING SETBACK	---
ULTIMATE RIGHT-OF-WAY	---
LEGAL RIGHT-OF-WAY	---
EASEMENT	---
BUFFER YARD	---
UTILITY POLE	○
OVERHEAD ELECTRIC	---
OVERHEAD TELEPHONE	---
OVERHEAD TELEVISION	---
UNDERGROUND ELECTRIC	---
UNDERGROUND TELEPHONE	---
UNDERGROUND TELEVISION	---
WATER MAIN & VALVE	○
GAS MAIN & VALVE	○
SANITARY SEWER	○
STORMSEWER	○
CHAIN-LINK FENCE	---
SIGN	---
CONTOUR	---
SPOT ELEVATION	---
DOOR SILL	---
ELECTRIC	---
EDGE OF PAVEMENT	---
EDGE OF SHOULDER	---
CONCRETE	---
DEPRESSED CURB	---
BITUMINOUS	---
TYPICAL	---

811
Know what's below.
Call before you dig.

NOTE:
PURSUANT TO THE REQUIREMENTS OF PA ACT 287, AS AMENDED, ISETT CONTACTED ONE CALL, INC. FOR A DESIGN PHASE LOCATION REQUEST. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN DEVELOPED FROM EXISTING UTILITY RECORDS AND/OR ABOVE-GROUND EXAMINATIONS OF THE SITE. COMPLETENESS, ACCURACY, LOCATION AND DEPTH OF UNDERGROUND UTILITIES OR STRUCTURES CANNOT BE GUARANTEED. THE CONTRACTOR, AT LEAST THREE (3) DAYS PRIOR TO PERFORMING ANY EXCAVATIONS, SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS AND DEPTHS OF ALL UNDERGROUND FACILITIES LOCATED WITHIN THE VICINITY OF THE WORK SITE IN ACCORDANCE WITH ACT 121. (PA ONE CALL SYSTEM, INC. 1-800-342-8770.)

THE SITE SERIAL NUMBER IS 20200632730, 20200632781, 20200632826, 20200632815, 20200632944.

DATE: 3/2/2021 DSGN: KPM
SCALE: 1"=50' CHK: KPM
DRAWN: JAK APPRD: KPM
JOB: 1015920.000 P/MGR: KPM
SHEET: 1 OF 1 COPYRIGHT 2021

SK-4

MOB., EXTENDED STAY HOTEL, RESTAURANT, RETAIL, BANK - OPTION 4

E&B HOTEL PARTNERSHIP, LP
SOUTH WHITEHALL TOWNSHIP
LEHIGH COUNTY, PA

610.388.0904
barry@isett.com
85 South Route 100
Allentown, PA 18106

BARRY ISETT & ASSOCIATES
REGISTERED PROFESSIONAL ENGINEERS AND CONSULTANTS



Seth A. Shapiro

Principal / Director of Urban Design

PROFILE

- Urban Land Institute (ULI)
- Delaware Valley Smart Growth Alliance - Vice President
- Villanova University - Guest Lecturer
- Drexel University - Co-Professor
- Temple University - Co-Lecturer
- Cliveden Annual Gathering - Guest Speaker
- CNU XV, Philadelphia - Steering Committee
- Nutter for Mayor - Zoning Board of Adjustment Reform Committee

Serving as the Director of Urban Design, Seth has more than 12 years of experience and a broad range of experience including residential (both affordable and market rate), mixed-use development, as well as expertise in public outreach and land entitlement. Seth has worked with private developers and public agencies throughout the country, including the Pennsylvania Real Estate Investment Trust, Brandywine Realty Trust, BPG Properties, LTD, and multiple housing and redevelopment authorities. His recent focus has been transit oriented development and traditional neighborhood design, with a specific concentration on the mixed-use redevelopment of suburban shopping centers.

SELECT PROJECTS

Concord Plaza

Wilmington, DE

Rockford Falls

Wilmington, DE

Liberty on the River

Philadelphia, PA

Franklin Master Plan

Franklin, NJ

Carpenter Park Mixed Use

Ithaca, NY

Dwell Apartments

Philadelphia, PA

PARC Apartments

Plymouth Meeting, PA

(*prior to joining BartonPartners)

Madison New Britain

Chalfont, PA

Madison French Creek

Phoenixville, PA

Berkley Town Center

Tom's River, NJ

Sharswood Redevelopment

Philadelphia, PA

Port Saint George's Mixed Use

New Castle County, DE

Keansburg Visioning

Keansburg, NJ

Saugatuck TOD

Westport, CT

Spring Oak TND

Charlestown, PA

Village of Olde Hickory

Lancaster, PA

Providence Town Center

Collegeville, PA

Orlando Fashion Square Mall

Orlando, FL*

Gloucester City Southport

Gloucester City, NJ*

Roosevelt Manor HOPE VI/Phase I

Camden, NJ*

Elizabeth Master Plan/HOPE VI

Elizabeth, NJ*

EDUCATION

Harvard University

Master of Architecture in Urban Design

Thesis: "Bridging the Gap: Rail Transit in a Commercial Edge City" -- a morphological investigation of the consequences of light rail transit retrofit into the commercial center of King of Prussia, PA.

University of Miami

Bachelor of Architecture





***PREMIER CENTER
LUXURY APARTMENTS***
*General Manual of Written and
Graphic Design Standards*

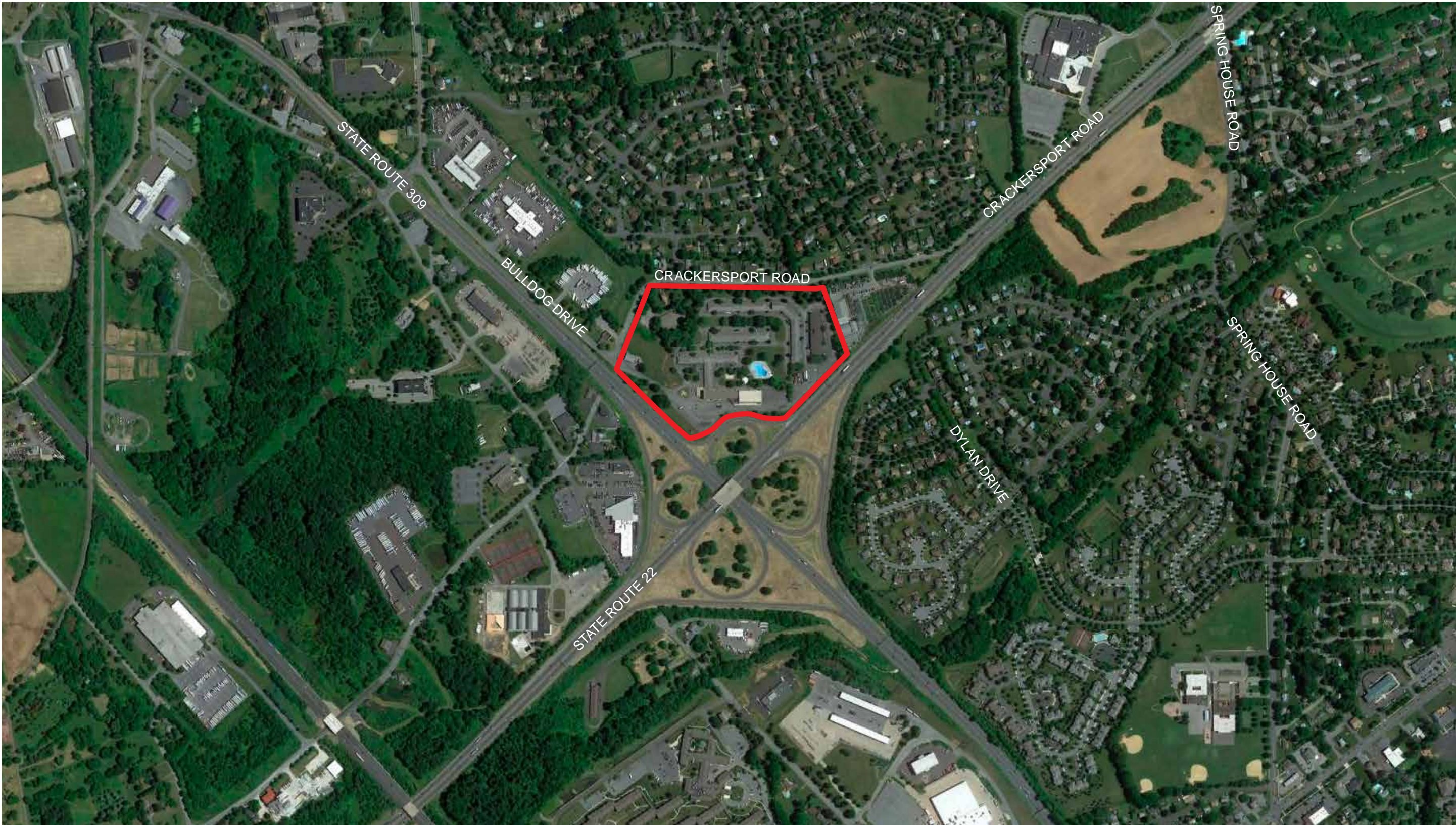
SOUTH WHITEHALL TWP, LEHIGH COUNTY

June 25th, 2021

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E&B HOTEL PARTNERSHIP, LP





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C-1 OVERALL GOALS.....03

C-2 BUILDING LOCATION.....05

C-3 BUILDING HEIGHT.....06

C-4 MAIN STREET ENVIRONMENT (MSE).....07

C-5 MSE - ANCHOR STORE/PARKING GARAGE.....08

C-6 MSE - COMMERCIAL USE WITH DRIVE-THROUGH.....N/A

C-7 MSE - CONVENIENCE STORE WITH FUEL PUMPS.....N/A

C-8 PARKING LOCATION.....11

C-9 ALLEYS.....12

C-10 PUBLIC REALM: OVERVIEW.....13

C-11 PUBLIC REALM: GREENS, SQUARES AND PLAZAS.....14

C-12 PUBLIC REALM: CLOSE.....15

C-13 STREETSAPES.....16

C-14 INDUSTRIAL DEVELOPMENTS.....N/A

TABLE OF CONTENTS

On behalf of the Premier Center Luxury Apartments Development Team, we are pleased to present this General Manual of Written and Graphic Design Standards for the property located at 1151 Bulldog Drive, in South Whitehall, PA.

C-1

Legislative Intent

- 1.1 This Manual is intended to comply with Section 708-A of the Pennsylvania Municipalities Planning Code titled: Manual of Written and Graphic Design Guidelines.
- 1.2 This Manual is intended to help protect and enhance the character of South Whitehall Township and promote preferred development types.
- 1.3 This Manual is intended to depict and illustrate the Design Standards and Development Regulations for preferred development outcomes.
- 1.4 The graphics provided are intended to illustrate the primary design element listed for each page and no other.

Design Standards

- 1.5 This Manual shall be applied to the Innovation Overlay Districts, as specified within certain zoning districts.
- 1.6 This Manual shall be utilized to plan, design, construct and maintain buildings, structures, streetscapes, and common open space.
- 1.7 The Design Standards depicted in the places, spaces, buildings, and streetscapes shown in this Manual shall be emulated.
- 1.8 This Manual shall be used in conjunction with the full text of the Zoning Ordinance and that of the Subdivision and Land Development Ordinance.
- 1.9 The pictures accompanying the text of this Appendix are for illustrative purposes only and shall not regulate any land use activity. An application's similarity or dissimilarity to any picture contained in this Appendix shall not be a basis of approval or denial of said application. Rather an application shall be judged solely on the basis of its compliance with the text of the Ordinance, including, without limitation, the text of this Appendix.

The mixed-use community proposed here is intended as a transformative redevelopment of an under-utilized and highly visible parcel located just to the northwest of the interchange of Routes 22 and 309 in South Whitehall Township, Lehigh County, PA. The site is zoned HC, or Highway Commercial, but is also afforded the option of utilizing the standards and guidelines outlined within the TND Commercial Retrofit Overlay District. When applying that option, this document entitled "General Manual of Written and Graphic Standards", is a requirement as part of a Conditional Use Submission.

Indeed, we have formatted this booklet to precisely mirror the outline provided in Appendix C of the South Whitehall Township Zoning Ordinance which provides the framework for this deliverable. As will be evident, not all categories within that document are applicable to this project. Those items are listed in the table of contents but assigned N/A as a page number.

While the entirety of the internal network of streets, parks and opens spaces are located on private property inside this project, we have designed these elements to comply

with the guidelines in Appendix C, understanding that the intent of those standards are to frame the public realm. As an example, we have designed our central boulevard to comply with the Main Street Environment (MSE) standards and we have designated our central open space as a "Close."

Finally, while the proposed project is indeed mixed use and includes program other than residential on the ground floor as is required by the ordinance, the project site's limited access characteristics prevent this project from being designed as a town center with copious and continuous ground level retail as envisioned in the guidelines. We have therefore attempted to carefully strike a balance between the need for active, non-residential uses on the ground floor, and the economic and practical realities associated with this location.

In the end, we believe we have met the spirit and intent of Appendix C of the South Whitehall Township Zoning Ordinance and look forward to working with the municipality on implementation of this exciting project.

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OVERALL GOALS



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C-2

Legislative Intent

- 2.1 Buildings are intended to be located close to sidewalks and in general alignment with other buildings on a block.
- 2.2 Buildings located along a Build-to Line are intended to help define a pedestrian friendly Streetscape.
- 2.3 Buildings located at corners are intended to provide "anchors" or "bookends" along both streets.

Design Standards

- 2.4 New buildings shall be placed at Build-to Lines in accordance with the TND Overlay Districts. A Build-to Line shall be established for each block and shall fall within the following ranges:
 - Neighborhood Infill Overlay Districts:
 - Broadway: 10 feet
 - Greenwalds: 15 to 20 feet
 - Clifford Park: 25 feet
 - All TND-Residential Areas: 10 to 15 feet
 - All TND- Nonresidential Areas: 5 to 15 feet
- 2.5 In the TND Overlay Districts, Build-to Lines shall progress from a shallower depth in the area of highest development intensity (i.e., the Main Street Environment, other nonresidential area, or highest density residential) to a less shallow Build-to Line in the less intense areas of development (typically the lowest density residential option).
- 2.6 New buildings on corner lots shall be placed along both Build-to Lines, unless an approved Green, Plaza, or Square is provided at the same street corner.
- 2.7 A maximum of 25% of the linear frontage of an individual building Facade may be offset from the Build-to Line by four (4) to twenty (20) feet in order to provide to provide visual diversity, architectural enhancement, or Open Space in the form of a Pedestrian Gathering Area or Plaza.

C-2 2.2 - All Townhomes along Crackersport Road are located along the Build-to Line in order to help create a pedestrian-friendly Streetscape.

C-2 2.3 & C-2 2.6- All buildings located on street corners are designed to anchor these intersections, and are placed at the Build-to Line.



C-2 2.1 - All buildings are close to sidewalks and align with one another on each block.

C-2 2.4 - All Build-to Lines within the site comply with being 10 to 15 feet from the internal street right of way.

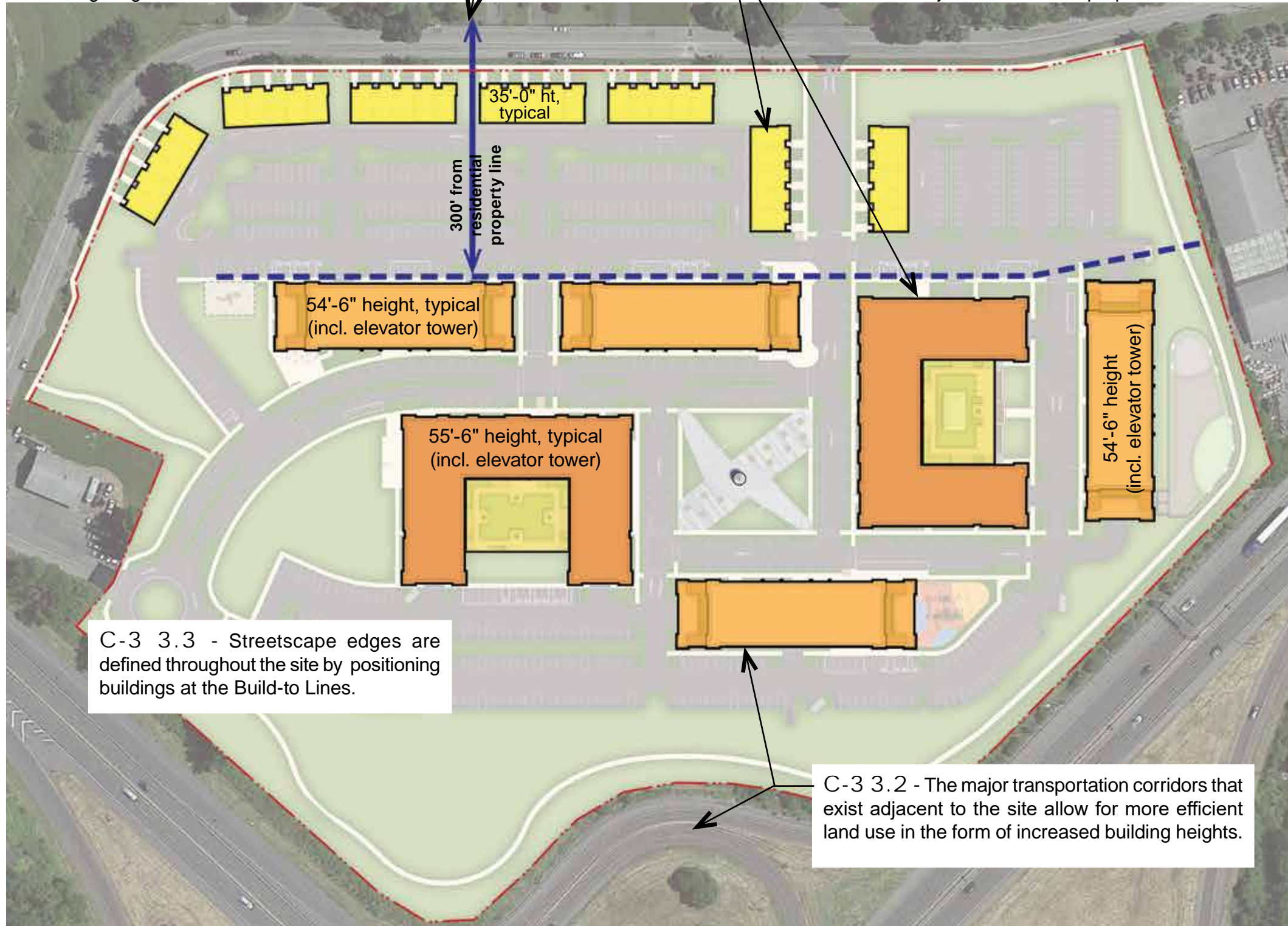
C-2 2.5 - All Build-to Lines within the site are most shallow along the main drive, which is the area of highest development intensity.

C-2 2.7 - All building facades have offsets less than 25% of the facade length from the Build-to Line.

BUILDING LOCATION

C-3 3.6 - All building heights higher than 35' are set back accordingly. A 300' setback is necessary for building heights between 45' and 60'.

C-3 3.1 - Building heights vary based on internal and external road hierarchy. Specifically, the lot's relation to Route 22 and adjacent residential properties.



C-3 3.3 - Streetscape edges are defined throughout the site by positioning buildings at the Build-to Lines.

C-3 3.2 - The major transportation corridors that exist adjacent to the site allow for more efficient land use in the form of increased building heights.

C-3

Legislative Intent

- 3.1 Maximum Building Height is intended to vary by Overlay District and location in relation to major commercial corridors.
- 3.2 Higher building heights are intended to induce more efficient land use while providing opportunities for a vertical mix of uses, particularly along major transportation corridors.
- 3.3 Minimum building heights along Build-to Lines are intended to help define more recognizable Streetscape edges.

Design Standards

- 3.4 A minimum Principal Building height of twenty (20) feet shall be provided in all Innovation Overlay Districts.
- 3.5 Maximum Principal Building heights permitted in the following Overlay Districts shall be:
 - Neighborhood Infill Overlay Districts/TND-Residential Cluster Overlay: 3 stories or 45 feet
 - TND-Commercial Retrofit: 3 stories and 45 feet, except along Arterial or Collector Roads: 4 stories and 60 feet; within 2000 feet of intersection with Route 22: 5 stories or 75 feet
 - TND-Industrial Infill: 3 stories and 45 feet, except along Arterial or Collector Roads: 4 stories and 60 feet
- 3.6 Buildings, or portions of Buildings, with heights greater than 35 feet shall be setback a minimum distance from existing residential uses or districts on adjacent non-TND lots, as measured from the lot line of such residential use or district:

Height	Setback
• 35 to 45 feet:	minimum of 50 feet;
• 45 to 60 feet:	minimum of 300 feet;
• 60 to 75 feet:	minimum of 500 feet.

C-3 3.4 - All building heights are above 20'.

C-3 3.5 - N/A; maximum building height for those above 35' are determined by setbacks, per C-3 3.6.

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BUILDING HEIGHT

C-4

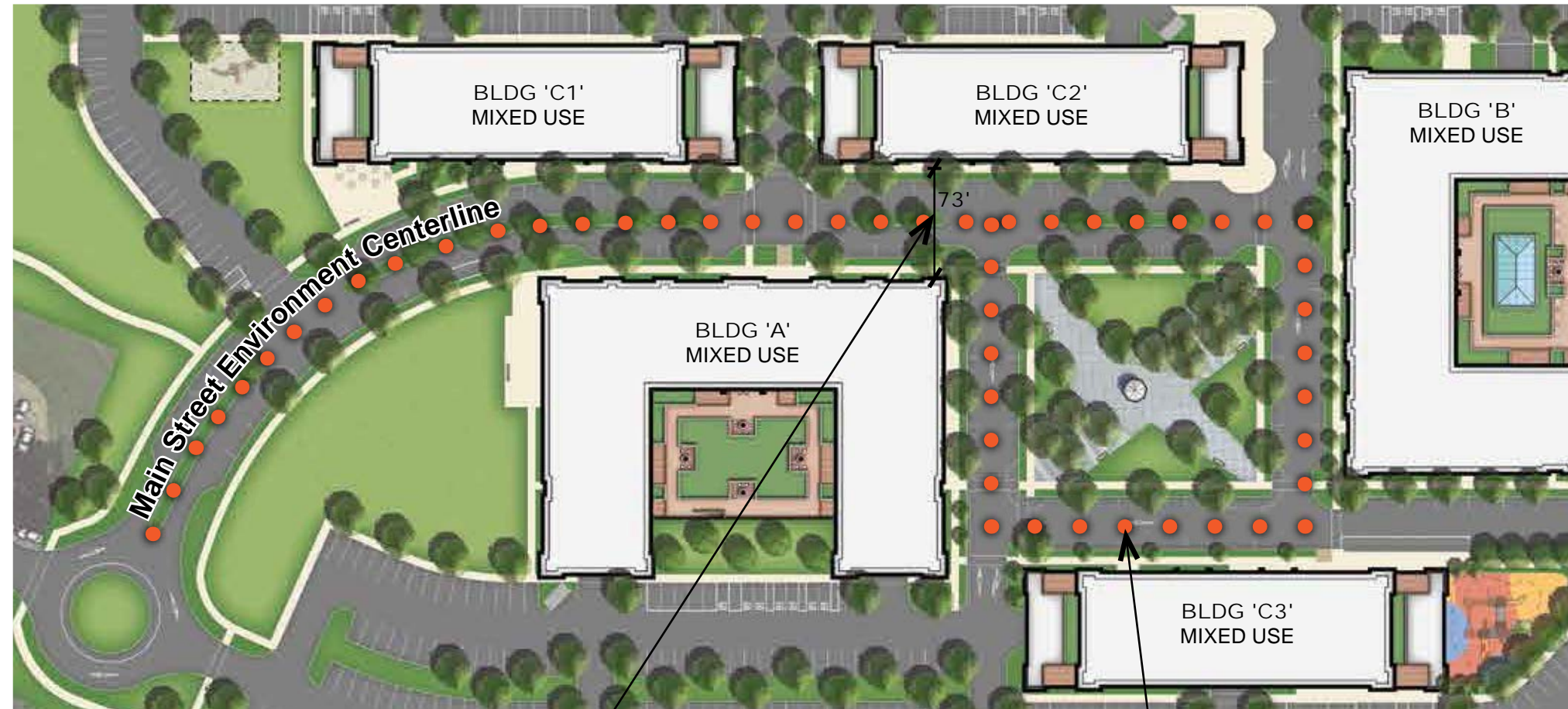
Legislative Intent

- 4.1 A Main Street Environment (MSE) is intended to serve as the focal point of a neighborhood.
- 4.2 A Main Street Environment is intended to be comprised of a mix of commercial, residential, and public uses, including open spaces, in a pedestrian friendly setting.
- 4.3 A Main Street Environment is intended to be provided in all Commercial Retrofit TND or where commercial uses are proposed in an Industrial TND.

Design Standards

- 4.4 The blocks that comprise the Main Street Environment shall be designed for a mix of commercial, residential and public uses, including common open space, in a series of attached and detached buildings located along a common Build-to Line.
- 4.5 The Streetscape Width in a Main Street Environment shall be between sixty (60) and one hundred (100) feet.
- 4.6 Buildings shall line the entire length of the Build-to Line along a Main Street Environment, except along curb cuts or where a Common TND Open Space is located.
- 4.7 The Main Street Environment shall provide on-street parking on at least one side of the street.
- 4.8 Off-street parking shall be located to the rear of buildings.
- 4.9 A minimum of 50% of the buildings in the MSE shall provide a second floor useable for apartments or office space.

C-4 4.1, C-4 4.2, & C-4 4.3- The main street through Premier Center Luxury Apartments is intended to emulate a Main Street Environment and provides a focal point for the neighborhood. This focal point is exhibited through using a mixture of first floor uses along the length of the street, as well as providing pedestrian friendly Open Spaces.



C-4 4.4 & C-4 4.6 - The MSE provides a mix of commercial, residential and public uses along its length, as well as providing building frontages along the same Build-to Line. The only breaks between buildings are due to curb cuts and TND Common Open Spaces.

C-4 4.5 - The proposed MSE streetscape width is between 60' & 100'.

C-4 4.9 - 100% of the buildings along the MSE have their second floor useable for apartments or office space.

C-4 4.7 & C-4 4.8 - The MSE provides on-street parking along both sides of the road, as well as off-street parking in the rear of buildings.

MAIN STREET ENVIRONMENT (MSE)

C-4

- 4.10 When anchor stores (larger than 75,000 square feet ground floor area), parking garages, commercial with drive-through service, or convenience stores with fuel pumps are located along a Main Street Environment, the buildings shall comply with the Lot Diagrams shown on the following pages.
- 4.12 Parking Garages and anchor stores shall meet the applicable build-to line, and where applicable, anchor corners.
- 4.13 Liner shops are strongly encouraged to be incorporated along the "Main Street" frontage of an anchor store in order to break up the facade, maintain a pedestrian friendly Streetscape, and provide a more traditional building width interval.
- 4.14 Parking Garages shall be "wrapped" by liner buildings or shops on the ground floor and shall be designed to have a facade that is consistent with the facades of the surrounding buildings.

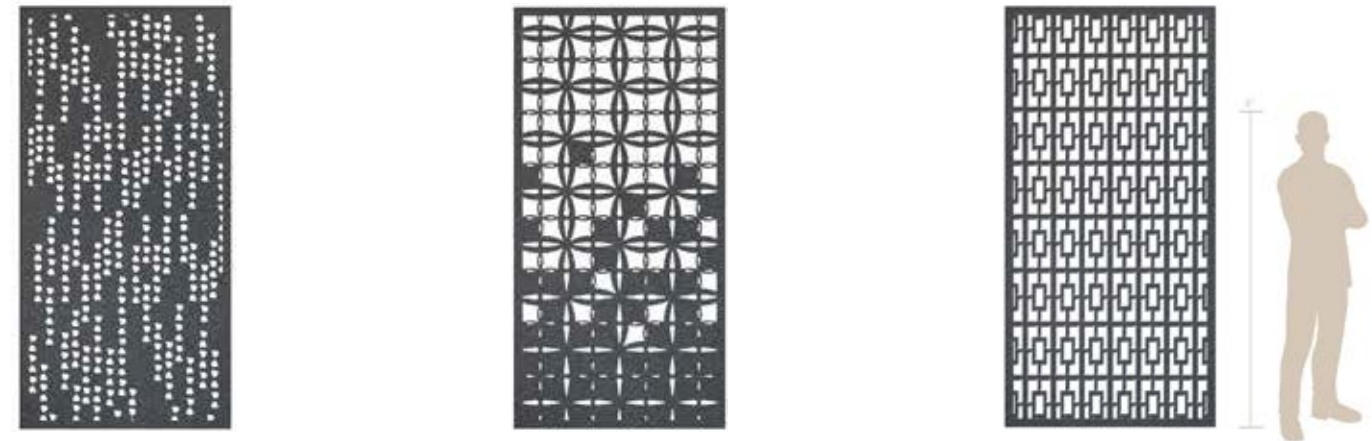
C-4 4.10 - Proposed buildings with ground-level podium parking are located along the Main Street Environment.

C-4 4.12 - All buildings, including those that have parking on their ground floor, meet the applicable build-to-line.

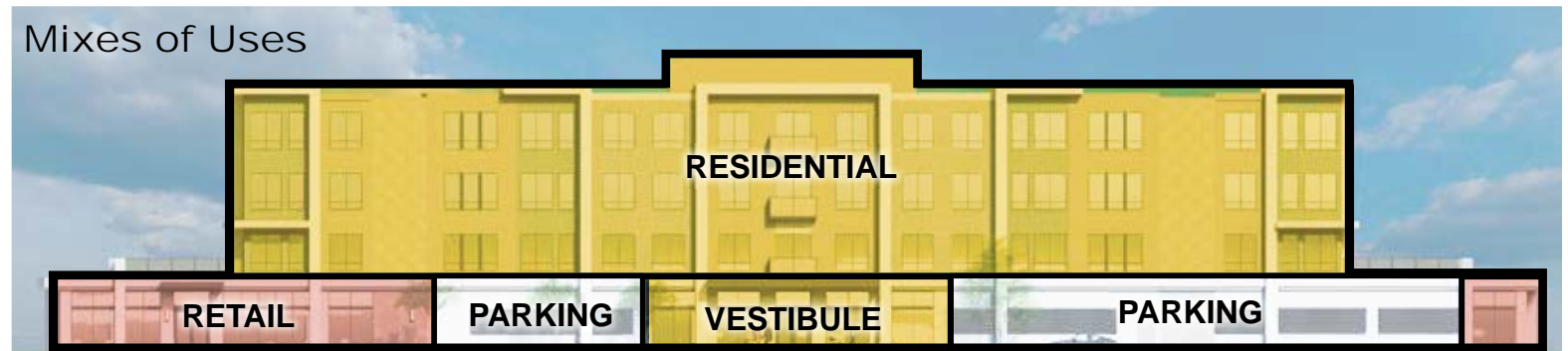
C-4 4.13 - Liner shops are not utilized since parking is only on the ground floor. Rather, the facades of the ground floor coordinates with that of the above floors' facade

C-4 4.14 - All podium parking areas are "wrapped" in facades that are consistent with the facades of adjacent/connected buildings.

Screening Examples



Mixes of Uses



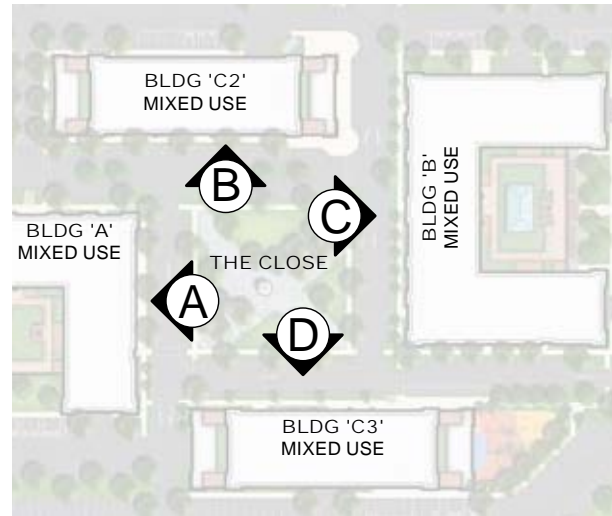
BUILDING C1 - Mixed Use with podium parking.

Screening to visually block parking area

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TYPICAL BUILDING FEATURES

Facades Surrounding the Close
Key Plan



ELEVATION A - Ground floor uses along the facade facing The Close include parking and commercial. The facade is consistent despite the shift in uses within the building.



ELEVATION B - Ground floor uses along the facade facing The Close include parking and commercial. The facade is consistent despite the shift in uses within the building.

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TYPICAL BUILDING FEATURES



ELEVATION C - Ground floor uses along the facade facing The Close include parking and commercial. The facade is consistent despite the shift in uses within the building.



ELEVATION D - Ground floor uses along the facade facing The Close include parking and commercial. The facade is consistent despite the shift in uses within the building.

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TYPICAL BUILDING FEATURES

C-8

Legislative Intent

- 8.1 Off-street parking areas are intended to be located to the rear of buildings.
- 8.2 Residential off-street parking is intended to be accessed via alleys to the greatest extent feasible to minimize curb cuts and preserve the streetscape character.
- 8.3 On-street parking is intended to provide necessary convenience parking spaces, while buffering pedestrians from passing vehicular traffic.

Design Standards

- 8.4 Off-street parking areas shall be located to the rear of buildings.
- 8.5 Off-street parking areas shall not be located at street corners.
- 8.6 A minimum of eighty (80) percent of off-street parking spaces for townhouse units, including garage access, shall be accessed via alleys.
- 8.7 All off-street parking for apartment buildings shall be located to the side or rear of the residential building.
- 8.8 On-street parking shall be provided where feasible, and be used to meet guest parking needs.

C-8 8.1 C-8 8.4, & C-8 8.5 - Off-street parking is located to the rear of buildings and avoids street corners.

C-8 8.2, C-8 8.6, & C-8 8.7 - All off-street parking, including garage spaces, are accessed via alleys and secondary streets.

C-8 8.3 & C-8 8.8 - On-street parking is proposed where feasible, and provides a pedestrian buffer while providing convenience spaces.

→ Off-street Parking: Garage Entry
 Off-street Parking
 ●●● Primary Street
 On-street Parking
 ●●● Alley



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PARKING LOCATION

● ● ● Alley



C-9

Legislative Intent

- 9.1 Alleys are intended to provide a secondary means of access to the side and/or rear of lots, provide access to required off-street parking, including garages, and installation of utilities.
- 9.2 Alleys are intended to minimize curb cuts and preserve a pedestrian oriented streetscape along the fronts of buildings.

Design Standards

- 9.3 A minimum of eighty (80) percent of off-street parking spaces for townhouse units, including garage access, shall be accessed via Alleys.
- 9.4 Alleys shall not terminate in a dead end or cul-de-sac.
- 9.5 Alleys shall be designed to have a minimum right-of-way width of eighteen (18) feet and minimum cartway width of sixteen (16) feet.
- 9.6 Garages and other structures shall be set back a minimum of four (4) feet from the alley.
- 9.7 Alleys shall meet the Intersection Standards and Construction Standards contained in the Subdivision and Land Development Ordinance for local roads, except that curbs and sidewalks shall not be required.
- 9.8 Alleys shall be privately owned and operated. The ownership and maintenance document shall be recorded prior to final approval of the Plan.

C-9 9.1, C-9 9.4 - The proposed alleys provide rear lot access to off-street parking. No alleys terminate in dead ends but rather connect to the greater off-street parking lot and secondary street grid.

C-9 9.2 & C-9 9.3 - 100% of off-street parking spaces for townhomes are accessed via alleys. These off-street parking are utilized for minimizing curb cuts.

C-9 9.5 & C-9 9.6 -All proposed alleys have a cartway width of 20', and all garages have access 2' off the alley.

C-9 9.7 -All proposed alleys meet the required Intersection Standards and Construction Standards.

C-9 9.8 -All proposed alleys will be privately owned and operated.

ALLEYS

C-10

Legislative Intent _____

10.1 The Public Realm is intended to be comprised of the complete network of sidewalks, crosswalks, public parks, and Common TND Open Space.

10.2 Useable Open Space is intended to be in the form of a Plaza(s); Green(s) or Square(s), Close, or like-type Pedestrian Gathering Area(s).

Design Standards _____

10.3 Provide Common Open Space and Useable Open Space in accordance with the TND Overlay Districts of South Whitehall Township.

10.4 Greens, Squares, Plazas, Closes, and other Pedestrian Gathering Areas shall comply with the Design Standards on the following pages.

C-10 10.1 & C-10 10.2 - The Public Realm includes sidewalks, crosswalks as well as TND Open Spaces. Active Open Spaces are proposed in the form of Greens and Closes, as well as a larger Open Space trail network.

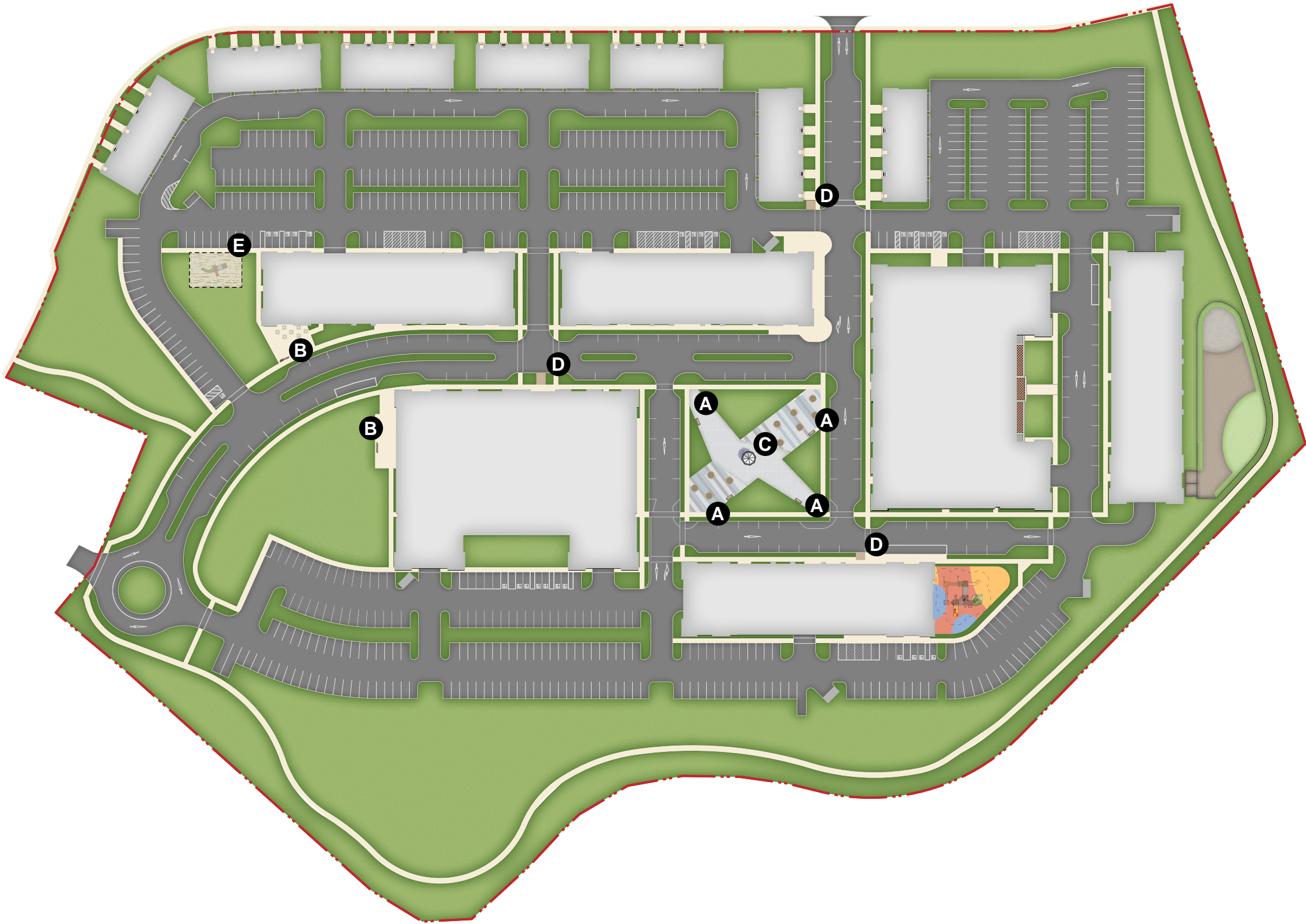
C-10 10.3 - Active Open Space for this site is required to be 1.17 acres; this site plan proposes 1.73 acres.

C-10 10.4 - The proposed Greens and Closes comply with the requirements on the following pages.



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PUBLIC REALM: OVERVIEW



C-11

Legislative Intent

11.1 Greens, Squares, and Plazas are intended to provide important public space to add balance and attractiveness to a proposed development.

Design Standards

11.2 Unless otherwise specified, Greens and Squares shall be sized in the range of 4,000 to 30,000 square feet.

11.3 Unless otherwise specified, Plazas shall be sized in the range of 1,000 to 4,000 square feet.

11.4 Greens, Squares, and Plazas shall have benches, shade trees, pavilions, gazebos, and other pedestrian amenities.

C-11 11.1 & C-11 11.2 - The proposed Greens are an invitation for public use and to balance the space between the buildings in a intentional way. All Greens are within 4,000 to 30,000 square feet.

C-11 11.3 - Non-Applicable, no Plazas are proposed.

C-11 11.4 - All Greens will have pedestrian amenities such as benches, shade trees, and open structures such as pavilions.

AMENITY KEY

- A** Potential Benches
- B** Potential Bike Racks
- C** Potential Gazebo
- D** School Bus Stop
- E** Potential Playground Area

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PUBLIC REALM: GREENS, SQUARES AND PLAZAS

C-12

Legislative Intent

- 12.1 The Close is intended as a public realm feature that provides green space in the center of the vehicular travel lanes.
- 12.2 The Close is intended to serve as an alternative to a conventional cul-de-sac, and to provide the opportunity for a Pedestrian Gathering Area in the center.
- 12.3 The Close is intended to be enclosed with buildings on three sides.

Design Standards

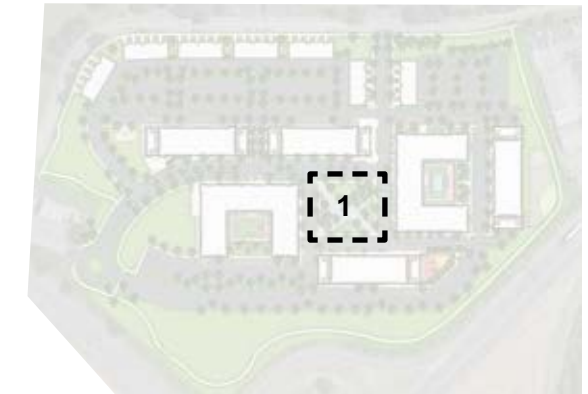
- 12.4 The Close shall be designed for one lane of counter-clockwise vehicular travel, with on-street parking on the building sides of the vehicular travel lane.
- 12.5 On-Street parking may be angled or parallel with the curb.
- 12.6 Green space of at least 4,500 square feet shall be created in the center of the Close.
- 12.7 The average width (shorter dimension) of the green space shall not be less than 25% of its average length (longer dimension).
- 12.8 The Close shall be wrapped with buildings on three sides, and the buildings shall be a minimum of two (2) stories or twenty (20) feet in height.
- 12.9 The Close may be utilized for development of tracts of 10 acres and greater.
- 12.10 The Close shall be used in lieu of a cul-de-sac.



1) Proposed Close - 19,340 SF

Key Plan

Locations of C-12 Open Spaces



C-12 12.1, C-12 12.2, & C-12 12.10 - The proposed Close is a green area designed to provide diagonal pedestrian access to opposite corners of the blocks surrounding the Close, while minimizing the number of times a pedestrian needs to cross vehicular traffic. The cartway provides the opportunity for vehicles to turn around as well as access both primary streets.

C-12 12.4, C-12 12.5, C-12 12.6 & C-12 12.7 - The proposed Close is surrounded by one lane travel on three sides, which is buffered by parallel parking spaces. Proposed green space within the close (not including proposed paving) is approximately 9,492 square feet. The width and length are equal.

C-12 12.3 & C-12 12.8 - There are buildings on four sides of the Close, as the two primary streets that converge at the Close are not centered upon it. All four buildings are greater than 20' in height.

C-12 12.9 - The greater site is 23.38 acres in size.



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PUBLIC REALM: CLOSE



C-13

Legislative Intent _____

- 13.1 The Streetscape is intended to be a pedestrian friendly area defined by Mixed-Use Buildings located along Build-to Lines, in close proximity to sidewalks, and buffered by on-street parking.
- 13.2 The Streetscape is intended to be enhanced with such features as street trees, street lights, benches, and like-type amenities.

Design Standards _____

- 13.3 A Streetscape, defined by buildings located in alignment and close to the sidewalk and curb, shall be established and maintained.
- 13.4 Where existing buildings are not located along the Build-to Line, a fence, pier and hedge combination, or a low, free-standing wall shall be installed and maintained along the Build-to Line.
- 13.5 The Streetscape shall be embellished with street trees and street lights, and enhanced with other street furniture and amenities.
- 13.6 Streetscape Width shall range in size from 60 feet to 100 feet, whereby Bookend Buildings opposite one another help to create the outdoor room character of the Streetscape.

C-13 13.1, C-13 13.3 & C-13 13.6 - The Streetscape's architectural elements encourage pedestrian traffic in multiple ways. The position and orientation of mixed-use buildings create a sense of enclosure which directly interacts with those walking next to them.

C-13 13.2 & C-13 13.5 - The Streetscape will be furnished with pedestrian-oriented amenities such as pedestrian and street lights, street trees, and benches.

C-13 13.4 - Non-Applicable; all buildings are on the Build-to Line.



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STREETSCAPE



ROBERT HOFFMAN, PE, PTOE

Regional Manager

YEARS OF EXPERIENCE

24 Years

EDUCATION

Widener University
B.S.E. / 1996 / Civil Engineering

REGISTRATIONS

Professional Engineer – PA, NJ, MD, SC, NC

PA License # PE-07751

NJ License # 24GE04728600

MD License # 47864

SC License # 35531

NC License # 050411

Professional Traffic Operations Engineer
Certificate #2725

PROFESSIONAL AFFILIATIONS

Institute of Transportation Engineers (ITE), Mid-Atlantic Section

National Society of Professional Engineers

Pennsylvania Society of Professional Engineers

CONTINUING EDUCATION

PSU, Transportation Engineering and Safety Conference

Northwestern University Traffic Institute, Intersection Design & Channelization Workshop

ITE, Roundabout Design & Construction

PERSONAL EXPERIENCE

Mr. Hoffman is a Senior Project Manager with experience in various aspects of traffic engineering work, serving municipal, agency and private sector clients. He has worked on a variety of projects of varying scope throughout the states of Pennsylvania and New Jersey, including commercial, residential, office, educational, recreational, and industrial land uses. His experience includes intersection/roadway geometric design, ADA compliant pedestrian facilities design, traffic impact studies, intersection analysis and design, traffic signalization and electrical design, signing and pavement marking plan preparation, maintenance and protection of traffic plan design and highway lighting design. He has also conducted parking demand and design studies, trip generation studies and traffic signal warrant analyses.

Mr. Hoffman has qualified and been accepted as an expert witness in municipalities throughout Pennsylvania and New Jersey.

PROJECT EXPERIENCE

Center Square Analysis

City of Easton, Northampton County, PA

As project manager, Mr. Hoffman oversaw the preparation the traffic and pedestrian analysis for the Center Square Traffic Circle in the City of Easton. An alternatives analysis was prepared and conceptual roadway plans were developed for several alternatives. Alternatives varied from configurations similar to existing operations with minor enhancements to more conventional roundabout designs, meeting current design standards.

Hamilton Crossings

Lower Macungie Township, Lehigh County, PA

As project manager, Mr. Hoffman oversaw the preparation the traffic analyses, roadway construction plans, traffic signal permit and construction plans and associated PennDOT permitting and municipal approvals. The project consists of a 570,000 square foot upscale shopping center. The project involved the realignment/redesign of a local road (Krocks Road) with the construction of multiple signalized site access locations. Additionally, a new collector-distributor roadway was designed and constructed along S.R. 0222, with access provided to the shopping center. Along Hamilton Boulevard, an additional two access locations were designed and constructed including a signalized access. The project also involved the design and development of an In Sync Traffic



Adaptive traffic signal system along Hamilton Boulevard, Krocks Road and S.R. 0222 including 6 signalized intersections.

KRE Springview Development

South Whitehall Township, Lehigh County, PA

As project manager, Mr. Hoffman oversaw the preparation the traffic impact study, roadway construction plans and associated PennDOT permitting and municipal approvals. The development consisted of a residential apartment complex with supporting retail uses. The project involved the design of corridor improvements along the Cetronia Road corridor between Schantz Road and Route 309, consisting of roadway widening, resurfacing and traffic signal improvements.

Allentown Arena and City Center Development

City of Allentown, Lehigh County, PA

As project manager, Mr. Hoffman oversaw the preparation the Master Plan Traffic Analysis and Parking Study for the redevelopment of Center City Allentown. The project includes a 10,000-seat arena, 168 luxury apartments, and more than 900,000 square feet of commercial and office development. The Traffic Analysis included evaluation of 16 key downtown intersections. The Parking Study included an analysis of daily and hourly parking demand at five existing public parking garages and several proposed parking garages.

SR 0145 Betterment, Section 07M

City of Allentown & Whitehall Township, Lehigh County, PA

Mr. Hoffman was the Lead Design Engineer for the PennDOT SR 0145 Betterment project in the City of Allentown and Whitehall Township. The project involved the design of a roadway overlay, ADA curb ramp designs, pavement design and traffic signal revisions along SR 0145 between the Sumner Avenue Bridge and Union Street.

Lowe's Home Improvement Stores

Various Municipalities throughout Pennsylvania

Mr. Hoffman, has managed various projects for the development of Lowe's Home Improvement stores throughout various municipalities in Pennsylvania. These projects included the preparation of Traffic Impact Studies, Parking Demand Studies, Roadway Improvement Designs, Traffic Signal Designs and Right-of-Way Dedication Plans. Additionally, all associated State and Local permits were obtained and expert testimony was provided.

Cabela's Retail Store

Tilden Township, Berks County, PA

Cabela's, the world's foremost outfitter of hunting, fishing, and outdoor gear, constructed a 250,000 square-foot store in Tilden Township, Pennsylvania, which opened for business as scheduled in Fall of 2003. Mr. Hoffman was responsible for the preparation of the preliminary traffic studies for two alternative sites in Pennsylvania. Once the Tilden Township site was selected, TPD prepared a comprehensive Traffic Impact Study for the project area, and then coordinated with the project

team, the Township, PennDOT, and FHWA to develop a two-phase traffic improvement plan for Route 61 and the I-78 interchange. Design challenges included an aggressive schedule, an interchange that was built in the 1950's, a Township road (Mountain Road) running through the site that both PennDOT and the Township had identified for relocation, and a store that would attract roughly 6 million visitors per year. Mr. Hoffman oversaw the preparation of the Traffic Impact Study and associated data collection, volume development, analyses and approvals.

Larry Holmes Drive Riverfront Revitalization

City of Easton, Northampton County, PA

Traffic Impact Study

Forks Township – Township Wide Transportation Study

Forks Township, Northampton County, PA

Roadway Sufficiency Analysis, Transportation Capital Improvements Plan

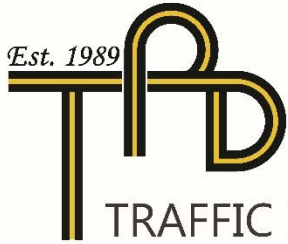
S.R. 0061/ S.R 0078 Improvements

Tilden Township, Berks County, PA

Project Manager responsible for the preparation of a Traffic Impact Study and Point of Access Study for the 264,000 square foot Cabela's Retail Store. The project involved modifications to an existing interchange to increase capacity and safety, as well as meeting current design standards. Additionally, Mr. Hoffman has played a key role in meetings with PennDOT and the Township. Other responsibilities included preparation of preliminary design concepts and resolution of on-site access management issues.

EXPERT TESTIMONY

Mr. Hoffman has qualified and served as an expert witness in municipalities throughout Pennsylvania and New Jersey including but not limited to, Bethel Township-Berks County, Ruscombmanor Township-Berks County, Spring Township-Berks County, Athens Township-Bradford County, Perkasio Borough-Bucks County, Quakertown Borough-Bucks County, Richmond Township-Bucks County, Tredyffrin Township-Chester County, South Whitehall Township-Lehigh County, Upper Macungie Township – Lehigh County, Whitehall Township-Lehigh County, Polk Township-Monroe County, Stroudsburg Borough - Monroe County, Towamencin Township - Montgomery County, Whitmarsh Township-Montgomery County, Forks Township-Northampton County, Lower Nazareth Township-Northampton County, Plainfield Township-Northampton County & Union Township – Hunterdon County.



TRAFFIC PLANNING AND DESIGN, INC.



Traffic Impact Study

Parkview Inn Redevelopment
South Whitehall Township, Lehigh County, PA

For Submission To:
South Whitehall Township

PARKVIEW INN REDEVELOPMENT TRANSPORTATION IMPACT STUDY

FOR SUBMISSION TO:

South Whitehall Township, Lehigh County, PA

Prepared For:

Boyle Construction, Inc
1209 Hausman Road, Suite B
Allentown, PA 18104

January 19, 2020

TPD # BOYC.00003

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Robert Hoffman, P.E., PTOE
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- Appendix B: Study Area Photographs
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EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed Parkview Inn redevelopment on the roadway network in South Whitehall Township, Lehigh County, PA. Based on this evaluation, the following conclusions were reached:

1. The project scope and the extent of the study area were confirmed with representatives from the Township via email correspondence. The study area intersections included in this TIS are as follows:
 - » Route 309 & Ridgeview Drive;
 - » Ridgeview Drive & Bulldog Drive;
 - » Ridgeview Drive & Walbert Avenue;
 - » Bulldog Drive & Crackersport Road;
 - » Crackersport Road & Winchester Road;
 - » Crackersport Road & Springhouse Road;
 - » Springhouse Road & Winchester Road.
2. The proposed project site is to be located on the property of the Parkview Inn. The proposed site is bound by Route 309 (S.R. 0309) to the west, Route 22 (S.R. 0022) to the south and Crackersport Road to the north.
3. The proposed mixed-use development will consist of the following land uses: 360 apartments, 35 low-rise townhomes, an 8,000 SF daycare facility and 15,540 square feet (SF) of retail space.
4. Access to the site will be served by two full-access driveways: one existing driveway at the intersection of Bulldog Drive and Crackersport Road and one proposed driveway on Crackersport Road aligned directly opposite Winchester Road.
5. Under the 2025 projected conditions all approaches and turning movements at the site driveway intersections with the external roadway network will operate at LOS B or better during weekday A.M. and weekday P.M. peak hours.
6. The available sight distance at the proposed new site driveway location will exceed PennDOT's desirable and safe stopping sight distance (SSSD) criteria.
7. Upon full build-out, the proposed development is expected to generate 330 new vehicle-trips during the weekday A.M. peak hour and 333 new vehicle-trips during the weekday P.M. peak hour.
8. All study area intersections will operate at an acceptable overall intersection level of service (ILOS) D or better under the 2025 projected condition scenarios with the exception of the intersection of Route 309 & Ridgeview Drive during the AM peak hour.
9. Traffic Planning and Design Inc. (TPD) recommends the following roadway improvements at the site access study area intersection with Crackersport Road:

Crackersport Road & Winchester Road/Proposed Full-Access Driveway

- » Provide a stop sign (PennDOT designation R1-1) to control traffic;
 - » Design the driveway with sufficient width and radii to accommodate the anticipated traffic utilizing the access.
10. TPD has prepared an all-way stop control warrant analysis for the intersection of Springhouse Road and Crackersport Road. Given the current configuration and the results of the all-way stop analysis

performed at the intersection of Springhouse Road & Crackersport Road, the Township may wish to consider pursuing the installation of all-way stop control at this intersection.

11. Levels of Service (LOS) for the study area intersections have been summarized in matrix form. **Table I** details the overall intersection LOS for each study area intersection.

TABLE I
LEVELS OF SERVICE (DELAY) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Conditions	Opening Year 2025		Existing Conditions	Opening Year 2025	
			Base	Projected		Base	Projected
Route 309 & Ridgeview Drive	EB L	C (23.2)	C (26.9)	C (27.6)	C (23.9)	C (24.3)	C (24.8)
	EB T	C (22.1)	C (25.1)	C (25.2)	C (24.1)	C (24.1)	C (24.2)
	EB R	B (15.0)	B (17.1)	B (17.1)	B (15.4)	B (15.5)	B (15.5)
	WB L	D (44.1)	F (133.2)	F (209.7)	D (36.3)	E (58.2)	F (96.6)
	WB TR	C (22.8)	C (26.1)	C (26.5)	C (23.7)	C (23.6)	C (23.9)
	NB L	C (23.3)	E (68.1)	E (68.1)	C (20.2)	D (53.5)	D (53.5)
	NB TR	C (26.2)	C (29.7)	C (33.4)	C (24.6)	D (45.2)	F (68.6)
	SB L	C (30.7)	C (34.2)	D (39.0)	C (30.7)	D (46.7)	E (55.4)
	SB TR	D (35.5)	D (41.9)	D (41.9)	C (28.6)	D (43.2)	D (43.2)
	ILOS	C (30.7)	D (50.8)	E (64.9)	C (25.0)	D (41.4)	D (51.0)
Ridgeview Drive & Bulldog Drive	WB L	B (10.1)	B (10.4)	B (10.6)	B (10.7)	B (11.2)	B (11.7)
	NB L/R	C (17.9)	C (21.0)	D (33.9)	C (19.2)	C (24.0)	E (37.5)
	ILOS	A (1.7)	A (1.9)	A (4.8)	A (1.5)	A (1.6)	A (3.9)
Walbert Avenue (S.R. 1006) & Ridgeview Drive	EB L	A (6.0)	A (6.8)	A (6.8)	B (10.5)	B (11.4)	B (11.4)
	EB TR	A (5.9)	A (6.3)	A (6.3)	A (8.6)	A (9.0)	A (9.0)
	WB L	A (7.9)	A (9.9)	A (9.9)	B (10.9)	B (13.2)	B (13.2)
	WB TR	A (5.7)	A (6.2)	A (6.2)	A (9.4)	A (9.7)	A (9.7)
	NB LT	B (10.2)	B (12.1)	B (12.1)	B (10.9)	B (13.2)	B (13.2)
	NB R	B (15.0)	B (17.8)	B (17.8)	B (11.2)	B (16.0)	B (16.0)
	SB L/T/R	B (10.7)	B (12.5)	B (12.5)	A (8.4)	B (10.3)	B (10.3)
	ILOS	A (8.5)	A (9.9)	A (9.9)	B (10.0)	B (12.0)	B (12.0)
Bulldog Drive & Crackersport Rod	WB L	A (8.4)	A (8.4)	A (8.7)	A (8.2)	A (8.2)	A (8.5)
	NB L/R	A (9.5)	A (9.5)	B (10.8)	A (8.8)	A (8.8)	A (9.6)
	ILOS	A (0.9)	A (0.9)	A (3.6)	A (2.0)	A (1.9)	A (3.1)
Crackersport Road & Winchester Road/ Proposed Site Driveway	EB L/T/R	A (8.4)	A (8.4)	A (8.4)	A (8.2)	A (8.2)	A (8.2)
	WB L/T/R	A (0.0)	A (0.0)	A (8.3)	A (0.0)	A (0.0)	A (8.3)
	NB L/T/R	--	--	B (10.3)	--	--	B (10.5)
	SB L/T/R	A (8.4)	A (8.4)	B (10.9)	A (8.6)	A (8.6)	B (11.4)
	ILOS	A (2.4)	A (2.3)	A (7.8)	A (1.6)	A (1.5)	A (7.1)
Crackersport Road & Springhouse Road	EB L	D (28.6)	D (32.4)	E (47.9)	C (24.2)	D (26.8)	D (33.8)
	EB R	B (11.6)	B (12.2)	B (12.8)	B (11.9)	B (12.3)	B (12.8)
	NB L	B (10.7)	B (11.0)	B (11.6)	A (9.8)	A (9.9)	B (10.2)
	NB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB R	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	ILOS	A (3.0)	A (3.0)	A (4.4)	A (1.3)	A (1.3)	A (2.2)
Springhouse Road & Winchester Road	EB L/T/R	A (10.0)	B (10.3)	B (11.2)	B (10.9)	B (11.4)	B (12.6)
	WB L/T/R	B (10.5)	B (10.8)	B (11.5)	C (17.2)	C (18.9)	C (22.3)
	NB L/T/R	B (11.0)	B (11.8)	B (13.0)	D (26.0)	E (35.7)	E (48.7)
	SB L/T/R	B (12.8)	B (14.2)	C (16.6)	B (14.2)	C (16.0)	C (19.3)
	ILOS	B (11.6)	B (12.5)	B (14.1)	C (20.0)	D (25.3)	D (32.1)

Base = No-Build scenario / Projected = Build scenario,

INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Study (TIS) for the proposed redevelopment of the Parkview Inn site in South Whitehall Township, Lehigh County, Pennsylvania. The proposed site is bounded by Route 309 (S.R. 0309) to the west, Route 22 (S.R. 0022) to the south and Crackersport Road to the north, as depicted in **Figure 1**.

As shown in **Figure 2**, The proposed mixed-use development will consist of the following land uses: 360 apartments, 35 low-rise townhomes, an 8,000 SF daycare facility and 15,540 square feet (SF) of retail space. Access to the site will be served by two full-access driveways: one existing driveway at the intersection of Bulldog Drive and Crackersport Road and one proposed driveway on Crackersport Road aligned directly opposite Winchester Road.

The scope of the Traffic Impact Study was confirmed with representatives from the Township via email correspondence. All relevant correspondence pertaining to this project has been included in **Appendix A**.

Internal Site Circulation

The internal street system design for the development includes traffic calming techniques such as a mini-roundabout, curb bump-outs, medians, and on-street parking. Implementation of these design techniques will result in lower vehicular speeds, which in turn will provide an environment conducive to bike and pedestrian activities. The plan includes a limited number of one-way internal streets, but the primary roadways through the development have been designed to accommodate two-way traffic.

EXISTING ROADWAY NETWORK

A field review of the existing roadway system in the study area was conducted. The existing roadway characteristics within the study area are summarized in **Table 1**. The existing lane configuration and intersection controls for the study area intersections are shown in **Figure 3**. Photographs of the study area intersections are included in **Appendix B**. The traffic signal permit plans are included in **Appendix C**.

TABLE 1
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	Functional Classification/ Roadway Type	Predominant Directional Orientation	Average Daily Traffic	Posted Speed Limit
Route 309	State (S.R. 0309)	Principal Arterial Highway	North-South	17,684	55 mph
Ridgeview Drive ¹	Township	Local	North-South	Not Available	35 mph
Walbert Avenue	State (S.R. 1006)	Urban Collector	East-West	9,384	45 mph
Bulldog Drive	Township	Local	North-South	Not Available	35 mph
Crackersport Road	Township	Local	East-West	Not Available	35 mph
Winchester Road ²	Township	Local	East-West	422	25/35 mph
Springhouse Road	Township	Urban Minor Arterial	North-South	7,311	30 mph

Land Use Context

In Chapter 4 of the *Smart Transportation Guidebook*, dated March 2008, there is guidance pertaining to defining the land use context(s) for a given area. Based upon review of this information, the land uses surrounding the proposed site best fits the Suburban Neighborhood designation, as described below:

Suburban Neighborhood, “predominately low density residential communities... typically arranged in a curvilinear internal system of streets with limited connections to regional road network or surrounding streets. . . .Neighborhoods can include community facilities such as schools, churches, recreational facilities, and some other stores and offices. When suburban houses line and arterial roadway but have their primary access to frontage roads or rear access roads, it is possible to classify this area as a suburban corridor.”

Roadway Type

In Chapter 5 of the *Smart Transportation Guidebook*, there is guidance pertaining to defining the transportation context(s) for a given area. Comparing the existing condition roadway characteristics to the various options presented in Table 5.1 of the *Smart Transportation Guidebook*, the study area roadways best fit the following categories, as described below:

Community Arterial, traffic volumes of 5,000 to 25,000 vehicles per day, intersection spacing of 300 to 1,320 feet, a desired operating speed of 25-55 mph, and a description as follows: “often classified as Minor Arterial in traditional classification but may include road segments classified as Principal Arterial.”

- Route 309 (S.R. 0309).

Community Collector, traffic volumes of 5,000 to 15,000 vehicles per day, intersection spacing of 300 to 660 feet, a desired operating speed of 25-55 mph, and a description as follows: “often similar in appearance to a community arterial. Typically classified as Major Collector.”

- Walbert Avenue (S.R. 1006).

Neighborhood Collector, traffic volumes of <6,000 vehicles per day, intersection spacing of 300 to 660 feet, a desired operating speed of 25-35 mph, and a description as follows: “similar in appearance to local roadways. Typically classified as Minor Collector.”

- Springhouse Road

Local Road, traffic volumes of <3,000 vehicles per day, intersection spacing of 000 to 660 feet, a desired operating speed of 20-30 mph.

- Ridgeview Drive;
- Bulldog Drive;
- Crackersport Road;
- Winchester Road.

EXISTING TRAFFIC CONDITIONS

Intersection Turning Movement Counts

TPD conducted intersection turning movement counts on 15-minute intervals during the weekday morning (7:00 to 9:00 A.M.) and the weekday evening (4:00 to 6:00 P.M.) peak periods. Data pertaining to heavy vehicles and pedestrians were also recorded. Peak hours and count dates for the study area intersections are identified in **Table 2**. The peak hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.

TABLE 2
TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour
Route 309 & Ridgeview Drive ¹	Thursday, June 1, 2017	Weekday A.M.	7:30 to 8:30 A.M.
		Weekday P.M.	4:45 to 5:45 P.M.
Ridgeview Drive & Bulldog Drive	Thursday, October 15, 2020	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:30 to 5:30 P.M.
Walbert Avenue (S.R. 1006) & Ridgeview Drive ¹	Thursday, June 1, 2017	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	4:45 to 5:45 P.M.
Bulldog Drive & Crackersport Road	Thursday, October 15, 2020	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	5:00 to 6:00 P.M.
Crackersport Road & Winchester Road	Thursday, October 15, 2020	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
Crackersport Road & Springhouse Road	Thursday, October 15, 2020	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:00 to 5:00 P.M.
Springhouse Road & Winchester Road	Thursday, October 15, 2020	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	4:00 to 5:00 P.M.

¹ = TPD utilized 2017 traffic counts since they were the most recent counts on record prior to COVID-19

Existing condition traffic volumes for the weekday A.M. and the weekday P.M. peak hours are illustrated in **Figures 4 & 5**, respectively. Traffic count data sheets are provided in **Appendix D**.

Automatic Traffic Recorder Counts

TPD also conducted Automatic Traffic Recorder (ATR) counts along the following roadways in the vicinity of the proposed site in order to determine the existing traffic volumes/patterns on a 24-hour weekday basis:

- » Existing Parkview Inn Driveway ("Bulldog Drive"), East of Park Manor Automotive;
- » Winchester Road between Crackersport Road and Valley Drive.

The ATR counts were conducted from Wednesday, October 14, 2020 until Wednesday, October 21, 2020.

Due to technical issues with the first set of counts, the following roadway was counted again:

- » Springhouse Road between Trexler Boulevard and Highland Street.

The additional ATR count was conducted from Tuesday, January 5, 2021 until Wednesday, January 13, 2021. Traffic count data sheets are provided in **Appendix D**.

COVID-19 Adjustments

TPD conducted new traffic counts at all study area intersections in October 2020. However, since traffic patterns have been impacted by COVID-19, TPD compared the 2020 traffic counts to historic traffic counts to assess whether it was appropriate to apply a traffic adjustment factor.

TPD compared the traffic counts at the two signalized intersections to 2017 traffic counts at the same locations. The results are summarized in **Table 3**.

TABLE 3
TRAFFIC COUNT COMPARISON

Intersection	Time Period	2017 Volumes	2020 Volumes	Difference
Route 309 & Ridgeview Drive	Weekday A.M.	2,786	2,092	-25%
	Weekday P.M.	2,883	2,366	-18%
Walbert Avenue (S.R. 1006) & Ridgeview Drive	Weekday A.M.	984	594	-40%
	Weekday P.M.	1,301	921	-29%

To be conservative, at locations where they were available TPD utilized the 2017 traffic counts as the “existing conditions” volumes for this traffic study. TPD adjusted the existing traffic volumes at the intersection of Ridgeview Drive & Bulldog Drive to balance with the intersection of Route 309 & Ridgeview Drive.

Since historic traffic counts were not available at the other study area intersections, TPD reviewed 2018 traffic counts from PennDOT’s TIRe database at two locations: Springhouse Road between Highland Street and Trexler Boulevard and along Winchester Road between Crackersport Road and Valley Drive. TPD then compared the 2018 traffic counts to ATR counts conducted by TPD at the same locations in 2020 and 2021. A comparison is summarized in **Table 4**.

TABLE 4
TRAFFIC COUNT COMPARISON

Roadway	Time Period	2018 Volumes	2020/2021 Volumes	Difference	Adjustment Factor
Springhouse Road	Weekday A.M.	672	528	-21%	1.27
	Weekday P.M.	867	716	-17%	1.21
Winchester Road	Weekday A.M.	47	33	-30%	1.42
	Weekday P.M.	43	45	--	0.96

Based on this data, TPD applied an adjustment factor of 1.27 to AM peak hour traffic counts and an adjustment factor of 1.21 to PM peak hour counts at the following intersections:

- » Crackersport Road & Bulldog Drive;
- » Crackersport Road & Winchester Road;
- » Crackersport Road & Springhouse Road;
- » Winchester Road & Springhouse Road.

It should be noted that the traffic adjustment methodology was provided and discussed with the Township Engineer prior to implementation in this study. It was agreed that the aforementioned adjustment methodology was appropriate. Traffic count data sheets are provided in **Appendix D**.

BASE (NO-BUILD) CONDITIONS

Annual Background Growth

A background growth factor for the roadways in the study area was developed based on growth factors for August 2020 to July 2021 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.38% per year in Lehigh County for urban non-interstate roadways. As such, the background growth factor was applied annually to yield overall growth percentages of 1.91% (0.38% per year, compounded over 5 years) for the year 2025.

Nearby Proposed Developments

Base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the year (2025) for the full-build out of the proposed development. Based on the scoping process and discussions with the Township Engineer, the following nearby planned developments were specifically included in this study:

Crackersport Road DC is a proposed flex warehouse project split into two sites. The total project consists of 898,800 sf. of warehouse space. The site is located on Crackersport Road and Eck Road. Trip distributions for this development were developed based on data provided in the Transportation Impact Study, dated January 3, 2018, prepared by Langan Engineering and Environmental Services, Inc. Excerpts from the study can be found in **Appendix E**.

4741 Chapmans Road is a proposed 156,000 s.f. flex warehouse facility. The site is located on Chapmans Road west of Route 309. Trip distributions for this development were developed based on data provided in the Supplement to the Transportation Impact Assessment Report, dated August 13, 2019, prepared by Keystone Consulting Engineers. Excerpts from the study can be found in **Appendix E**.

Parkland Manor Phase 4 is a proposed senior living facility consisting of 64 1-bedroom units and 16 studios. The site is located along Crackersport Road west of Hausman Road. Trip distributions for this development were developed based on data provided in the Trip Generation Analysis, dated January 30, 2020, prepared by Penn Technology Consulting, LLC. Excerpts from the study can be found in **Appendix E**.

1215 Hausman Road is a proposed flex warehouse facility consisting of 90,100 s.f. of warehouse/light industrial space. The site is located on Hausman Road between Crackersport and Ridgeview Drive. Trip distributions for this development were developed based on data provided in the Trip Generation Assessment for the Hausman Road Warehouse Development, dated April, 2019, prepared by McMahon Associates, Inc. Excerpts from the study can be found in **Appendix E**.

The Hills at Winchester is a proposed age-restricted residential and restaurant development consisting of 42 single family detached dwelling units, 118 detached senior housing units, 88 attached senior housing units, and a 5,000 s.f. quality restaurant. The site is located on the north side of Walbert Avenue (S.R. 1006) west of Cedar Crest Boulevard (S.R. 1019) and east of S.R. 309. Access is proposed via three proposed access locations from the site directly onto Walbert Avenue (S.R. 1006), two of which are opposite Hampton Road and 40th Street. Trip distributions for this development were developed based on data provided in Lehigh Engineering's *Traffic Impact Study for the Hills at Winchester*, last revised November 2015. Trip generation and trip distribution data for the site is included in **Appendix E**.

The Ridge Farm is a proposed mixed-use development consisting of approximately 181 single family homes and 280 twin homes, 408 apartments, 17,200 SF of restaurant space, 20,000 SF of retail space and 30,000 SF of medical office space. The site is located on both the west and east sides of Cedar Crest Boulevard (S.R. 1019), north of Walbert Avenue (S.R. 1006). Access is proposed as follows:

- » One full access driveway to Walbert Avenue (S.R. 1006), aligned with Office Center Road;
- » One right-in/right-out driveway to Walbert Avenue (S.R. 1006);
- » Two right-in/right-out/left-in driveways to Cedar Crest Boulevard (S.R. 1019);
- » Two full access driveways to Huckleberry Road east of Cedar Crest Boulevard (S.R. 1019);
- » One full access driveway to Huckleberry Road west of Cedar Crest Boulevard (S.R. 1019);

- » Seven single-family home driveways to Huckleberry Road west of Cedar Crest Boulevard (S.R. 1019);
- » Connection to Buchman Street at Roosevelt Street;
- » One full access driveway to the Yellowstone Road extension (being created by this project);
- » One connection to Ridge Lane.

Trip distributions for this development were developed based on data provided in Traffic Planning & Design's *Traffic Impact Study for the Ridge Farm Development*, last revised January 21, 2020. Trip generation and trip distribution data for the site is included in **Appendix E**

The additional traffic volumes due to background growth and background developments were added to the existing traffic data to produce 2025 base (no-build) condition traffic volumes. 2025 base condition volumes for the weekday A.M. and the weekday P.M. peak hours are illustrated in **Figures 6 & 7**. Trip distribution information for the nearby developments are included in **Appendix E**.

SCHEDULED ROADWAY IMPROVEMENTS

Programmed Improvements

Based on a review of the Pennsylvania Transportation Improvement Program (TIP) there are no programmed roadway improvements in the vicinity of the proposed site.

The following is a summary of roadway improvements proposed in conjunction with nearby developments:

Ridge Farm Development

As outlined in the *Ridge Farm Development Traffic Impact Study*, prepared by TPD, last revised January 21, 2020, the planned roadway improvements associated with the development include the restriping of Ridgeview Drive to provide a 530-foot long left-turn lane at the intersection of Route 309 & Ridgeview Drive.

Crackersport Road DC/Eck Road Warehouses

As outlined in the *Crackersport Road DC/Eck Road Warehouses Traffic Impact Study*, prepared by Langan, last revised January 3, 2018 planned roadway improvements associated with the development include signal equipment and retiming, as well as radii improvements and restriping at the intersection of Route 309 & Ridgeview Drive.

The roadway improvements summarized above have been included in all future condition analyses (base and projected conditions). A copy of the conceptual design for the turn lane extension improvement is included in **Appendix F**. A copy of the updated signal timings is included in **Appendix C**.

PROPOSED SITE ACCESS

Access to the site will be served by two full-access driveways: one existing driveway at the intersection of Bulldog Drive and Crackersport Road and one proposed driveway on Crackersport Road aligned directly opposite Winchester Road.

Sight Distance Analysis

A sight distance analysis was prepared for the proposed site driveways. In general, recommended safe sight distances depend upon the posted speed limit and roadway grades. The existing sight distances at the proposed driveways were measured in accordance with PennDOT Publication 282 Highway Occupancy Permit Operations Manual and compared to PennDOT’s desirable sight distance standard, which is identified in 67 PA Code Chapter 441.8(h), “Access to and Occupancy of Highways by Driveways and Local Roads.” In addition, measured sight distances at the proposed driveways were compared to PennDOT’s safe stopping sight distance standard, which is calculated by the following equation:

$$SSSD = 1.47VT + V^2/[30(f \pm g)]$$

SSSD = safe stopping sight distance (acceptable sight distance)

V = Vehicle Speed

T = Perception Reaction Time of Driver (2.5 seconds)

f = Coefficient of Friction for Wet Pavements

g = Percent of Roadway Grade Divided by 100

Table 5 shows the measured, desirable, acceptable (SSSD), and required sight distances at the new site driveway along Crackersport Road for vehicles entering and exiting the site.

TABLE 5
SIGHT DISTANCE ANALYSIS
SITE DRIVEWAY TO CRACKERSPORT ROAD OPPOSITE WINCHESTER ROAD

	Direction	Speed	Grade ¹	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	35 mph	0%	440'	249'	500'+
	To the right	35 mph	-1%	350'	252'	500'+
Entering Left Turns	Approaching same direction	35 mph	-1%	300'	252'	375'
	Approaching opposite direction	35 mph	0%	300'	249'	500'+

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance
EXIST = Existing (measured) Sight Distance

¹ = Roadway Grade Approaching Driveway

As shown in **Table 5** above, the measured sight distances at the site driveway exceeds PennDOT’s desirable sight distance requirements.

TRIP GENERATION

The trip generation rates for the proposed development were obtained from the *Trip Generation Manual*, Tenth Edition, 2017, an institute of Transportation Engineers (ITE) Informational Report. The statistics in *Trip Generation* are empirical data based on more than 4,800 trip generation studies. The data are categorized by Land Use Codes, with total vehicular trips for a given land use estimated using an independent variable and statistically generated rates or equations.

For the proposed townhouses, TPD utilized Land Use Code 220 (Multifamily Housing – Low-Rise). For the proposed apartments, TPD utilized Land Use Code 221 (Multifamily Housing – Mid-Rise). For the proposed daycare center, TPD utilized Land Use 565 (Day Care Center), and for the remainder of the proposed commercial

space TPD utilized Land Use Code 820 (Shopping Center). **Table 6** shows the rates/equations and directional percentages for the analyzed time periods.

TABLE 6
ITE TRIP GENERATION DATA

Land Use	ITE #	Time Period	Independent Variable	Equations/Rates	Entering %	Pass-By %	Maximum Pass-by% ¹
Mid-Rise Multi-Family Housing	221	Average Weekday	360 units	$T = 3.44*(X)$	50%	0%	0%
		Weekday AM Peak Hour		$T = 0.30*(X)$	26%	0%	0%
		Weekday PM Peak Hour		$T = 0.36*(X)$	61%	0%	0%
Low-Rise Multi-Family Housing	220	Average Weekday	35 units	$T = 7.56*(X) - 40.86$	50%	0%	0%
		Weekday AM Peak Hour		$\ln(T) = 0.95 \ln(X) - 0.51$	23%	0%	0%
		Weekday PM Peak Hour		$\ln(T) = 0.89 \ln(X) - 0.02$	63%	0%	0%
Day Care Center	565	Average Weekday	8,000 SF	$T = 47.62*(X)$	50%	0%	0%
		Weekday AM Peak Hour		$T = 11.00*(X)$	53%	44%	25%
		Weekday PM Peak Hour		$T = 11.12*(X)$	47%	44%	22%
Shopping Center	820	Average Weekday	15,540 SF	$\ln(T) = 0.68 \ln(X) + 5.57$	50%	0%	0%
		Weekday AM Peak Hour		$T = 0.50*(X) + 151.78$	62%	24%	14%
		Weekday PM Peak Hour		$\ln(T) = 0.74 \ln(X) + 2.89$	48%	34%	19%

T = number of site-generated vehicular trips

X = independent variable

¹ = Maximum pass-by trips were calculated as 20% of total adjacent street volumes. The resulting percentages are based on pass-by trips vs. total trips

Pass-By Trips and Diverted Linked Trips

According to the *Trip Generation Manual*, not all of the trips generated by the proposed development will be new to the surrounding area. A distinction was made between “new” trips, which are trips made to/from the study area for the express purpose of visiting the site, “pass-by” trips, which are trips made to the site by traffic passing the retail center on the adjacent roadways en route to another destination, and “diverted-linked” trips, which are trips made to the site by traffic diverting from a nearby roadway or freeway. TPD assumed that all pass-by trips would occur on Crackersport Road but limited the number of pass-by trips to 20 percent of the existing traffic volumes.

The calculated trip generation for the proposed development is shown in **Table 7**.

TABLE 7
TRIP GENERATION SUMMARY

Land Use	Size	External Trips			Pass-By Trips			New Trips		
		Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Weekday										
Mid-Rise Multifamily Housing	360 units	1238	619	619	0	0	0	1238	619	619
Low-Rise Multifamily Housing	35 units	224	112	112	0	0	0	224	112	112
Daycare	8,000 SF	382	191	191	0	0	0	382	191	191
Shopping Center	15,540 SF	1696	848	848	0	0	0	1696	848	848
Total		3540	1770	1770	0	0	0	3540	1770	1770
Weekday A.M. Peak Hour										
Mid-Rise Multifamily Housing	360 units	108	30	78	0	0	0	108	30	78
Low-Rise Multifamily Housing	35 units	18	4	14	0	0	0	18	4	14
Daycare	8,000 SF	88	47	41	22	11	11	66	36	30
Shopping Center	15,540 SF	160	99	61	22	11	11	138	88	50
Total		374	180	194	44	22	22	330	158	172
Weekday P.M. Peak Hour										
Mid-Rise Multifamily Housing	360 units	130	91	39	0	0	0	130	91	39
Low-Rise Multifamily Housing	35 units	23	14	9	0	0	0	23	14	9
Daycare	8,000 SF	89	42	47	20	10	10	69	32	37
Shopping Center	15,540 SF	137	66	71	26	13	13	111	53	58
Total		379	213	166	46	23	23	333	190	143

Based on the trip generation analysis summarized in **Table 7**, the development will generate approximately **330** new trips during the weekday A.M. peak hour and **333** new trips during the weekday P.M. peak hour.

TRIP DISTRIBUTION

The trip distribution calculations for the residential portion of the development were based on an analysis of US Census Bureau data, as obtained from OnTheMap.com in November 2020. TPD analyzed data regarding the workplace location of all people who live in census tract 60.02. TPD determined what percentage of people who live in census tract 60.02 work in each of the surrounding municipalities and then assigned the trips based on the most direct travel route(s) to each municipality. The trip distribution calculations and a map of the census tract location is included in **Appendix G**. Based on feedback from the Township Engineer, it was agreed that the retail trip distribution would be adjusted to reflect a more localized service area for the retail uses.

The new trips for the proposed development were distributed to the local roadway network based on the percentages shown in **Table 8**.

TABLE 8
TRIP DISTRIBUTION PERCENTAGES

Direction (To/From)	Assignment (To/From)	Distribution Percentage	
		Residential	Retail
East	via Route 22 (using Route 309 Interchange)	10%	5%
	via Route 22 (using Cedar Crest Blvd. Interchange)	10%	5%
	via Winchester Road	0%	10%
	via Walbert Avenue	15%	30%
West	via Route 22 (using S.R. 309 Interchange)	25%	5%
	via Ridgeview Drive	5%	5%
North	via S.R. 309	5%	5%
South	via S. R. 309	20%	5%
	via Springhouse Road	10%	30%

A portion of retail trips were assumed to be local from adjacent neighborhoods due to the nature of the proposed land uses. Therefore, 10 percent of traffic traveling via Winchester to/from the east and 10 percent of traffic traveling via Walbert Avenue to/from the east were assumed to be local traffic which would be distributed into local streets off Winchester Road between Crackersport Road and Springhouse Road.

The site-generated retail trips for the weekday A.M. and P.M. peak hours are shown in **Figures 8 & 9**, and the site-generated residential trips are shown in **Figures 10 & 11**. The total site-generated trips are shown in **Figures 12 & 13**.

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2025 base (no-build) condition traffic volumes to develop 2025 projected (build) condition traffic volumes. Projected condition traffic volumes for the opening year of 2025 for the weekday A.M. and weekday P.M. peak hours are shown in **Figures 14 & 15**. Traffic volume development worksheets are contained in **Appendix G**.

LEVELS OF SERVICE FOR AN INTERSECTION

For analysis of intersections, level of service is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS criteria is stated in terms of control delay per vehicle for a one-hour analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The criteria are shown in **Table 9**. Delay, as it relates to level of service, is a complex measure and is dependent upon a number of variables. For signalized intersections, these variables include the quality of vehicle progression, the cycle length, the green time ratio, and the volume/capacity ratio for the lane group in question. For unsignalized intersections, delay is related to the availability of gaps in the flow of traffic on the major street and the driver's discretion in selecting an appropriate gap for a particular movement from the minor street (straight across, left or right turn).

TABLE 9
LEVEL OF SERVICE CRITERIA
UNSIGNALIZED AND SIGNALIZED INTERSECTIONS¹

Level of Service	Control Delay Per Vehicle (Seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10 and < 20	> 10 and < 15
C	> 20 and < 35	> 15 and < 25
D	> 35 and < 55	> 25 and < 35
E	> 55 and < 80	> 35 and < 50
F	> 80 or v/c > 1.0	> 50 or v/c > 1.0

¹ Obtained from Exhibits 18-4 and 19-1 of the Transportation Research Board's Highway Capacity Manual 2010

CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted for the weekday A.M. and weekday P.M. peak hours at the study area intersections. These analyses were conducted according to the methodologies contained in the *Highway Capacity Manual 6th Edition* (HCM) using *Synchro 10* software, a Trafficware product.

The following conditions were analyzed, as applicable:

- » Existing conditions;
- » 2025 Base conditions (Build-out year without development);
- » 2025 Projected conditions (Build-out year with development).

It should be noted that based on methodologies contained in Chapter 10 of PennDOT's Publication 46, TPD adjusted the HCM default values in the *Synchro 10* capacity analysis. These adjustments were made at both the signalized and unsignalized intersections within the study area for all time periods based on the study area location being classified as suburban. The capacity analysis worksheets are included in **Appendix H**. Critical and follow-up headway calculation worksheets are included in **Appendix I**.

LEVELS OF SERVICE IN THE STUDY AREA

Level of service (LOS) matrices for the study area intersections are shown in **Table 10** for the weekday A.M. and the weekday P.M. peak hours. Per PennDOT standards, the signal timings at the signalized study area intersections have been optimized under base conditions and projected conditions.

TABLE 10
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Conditions	Opening Year 2025		Existing Conditions	Opening Year 2025	
			Base	Projected		Base	Projected
Route 309 & Ridgeview Drive	EB L	C (23.2)	C (26.9)	C (27.6)	C (23.9)	C (24.3)	C (24.8)
	EB T	C (22.1)	C (25.1)	C (25.2)	C (24.1)	C (24.1)	C (24.2)
	EB R	B (15.0)	B (17.1)	B (17.1)	B (15.4)	B (15.5)	B (15.5)
	WB L	D (44.1)	F (133.2)	F (209.7)	D (36.3)	E (58.2)	F (96.6)
	WB TR	C (22.8)	C (26.1)	C (26.5)	C (23.7)	C (23.6)	C (23.9)
	NB L	C (23.3)	E (68.1)	E (68.1)	C (20.2)	D (53.5)	D (53.5)
	NB TR	C (26.2)	C (29.7)	C (33.4)	C (24.6)	D (45.2)	F (68.6)
	SB L	C (30.7)	C (34.2)	D (39.0)	C (30.7)	D (46.7)	E (55.4)
	SB TR	D (35.5)	D (41.9)	D (41.9)	C (28.6)	D (43.2)	D (43.2)
	ILOS	C (30.7)	D (50.8)	E (64.9)	C (25.0)	D (41.4)	D (51.0)
Ridgeview Drive & Bulldog Drive	WB L	B (10.1)	B (10.4)	B (10.6)	B (10.7)	B (11.2)	B (11.7)
	NB L/R	C (17.9)	C (21.0)	D (33.9)	C (19.2)	C (24.0)	E (37.5)
	ILOS	A (1.7)	A (1.9)	A (4.8)	A (1.5)	A (1.6)	A (3.9)
Walbert Avenue (S.R. 1006) & Ridgeview Drive	EB L	A (6.0)	A (6.8)	A (6.8)	B (10.5)	B (11.4)	B (11.4)
	EB TR	A (5.9)	A (6.3)	A (6.3)	A (8.6)	A (9.0)	A (9.0)
	WB L	A (7.9)	A (9.9)	A (9.9)	B (10.9)	B (13.2)	B (13.2)
	WB TR	A (5.7)	A (6.2)	A (6.2)	A (9.4)	A (9.7)	A (9.7)
	NB LT	B (10.2)	B (12.1)	B (12.1)	B (10.9)	B (13.2)	B (13.2)
	NB R	B (15.0)	B (17.8)	B (17.8)	B (11.2)	B (16.0)	B (16.0)
	SB L/T/R	B (10.7)	B (12.5)	B (12.5)	A (8.4)	B (10.3)	B (10.3)
	ILOS	A (8.5)	A (9.9)	A (9.9)	B (10.0)	B (12.0)	B (12.0)
Bulldog Drive & Crackersport Rod	WB L	A (8.4)	A (8.4)	A (8.7)	A (8.2)	A (8.2)	A (8.5)
	NB L/R	A (9.5)	A (9.5)	B (10.8)	A (8.8)	A (8.8)	A (9.6)
	ILOS	A (0.9)	A (0.9)	A (3.6)	A (2.0)	A (1.9)	A (3.1)
Crackersport Road & Winchester Road/ Proposed Site Driveway	EB L/T/R	A (8.4)	A (8.4)	A (8.4)	A (8.2)	A (8.2)	A (8.2)
	WB L/T/R	A (0.0)	A (0.0)	A (8.3)	A (0.0)	A (0.0)	A (8.3)
	NB L/T/R	--	--	B (10.3)	--	--	B (10.5)
	SB L/T/R	A (8.4)	A (8.4)	B (10.9)	A (8.6)	A (8.6)	B (11.4)
	ILOS	A (2.4)	A (2.3)	A (7.8)	A (1.6)	A (1.5)	A (7.1)
Crackersport Road & Springhouse Road	EB L	D (28.6)	D (32.4)	E (47.9)	C (24.2)	D (26.8)	D (33.8)
	EB R	B (11.6)	B (12.2)	B (12.8)	B (11.9)	B (12.3)	B (12.8)
	NB L	B (10.7)	B (11.0)	B (11.6)	A (9.8)	A (9.9)	B (10.2)
	NB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB R	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	ILOS	A (3.0)	A (3.0)	A (4.4)	A (1.3)	A (1.3)	A (2.2)
Springhouse Road & Winchester Road	EB L/T/R	A (10.0)	B (10.3)	B (11.2)	B (10.9)	B (11.4)	B (12.6)
	WB L/T/R	B (10.5)	B (10.8)	B (11.5)	C (17.2)	C (18.9)	C (22.3)
	NB L/T/R	B (11.0)	B (11.8)	B (13.0)	D (26.0)	E (35.7)	E (48.7)
	SB L/T/R	B (12.8)	B (14.2)	C (16.6)	B (14.2)	C (16.0)	C (19.3)
	ILOS	B (11.6)	B (12.5)	B (14.1)	C (20.0)	D (25.3)	D (32.1)

Given the current configuration of the intersection of Springhouse Road & Crackersport Road, the Township may wish to consider pursuing the installation of all-way stop control at this intersection.

95TH PERCENTILE QUEUE ANALYSIS

Queue analyses were conducted at the study area intersections using *Synchro 10* software. For this analysis, the 95th percentile queue is defined as the queue length that is exceeded in 5% of the signal cycles. As an example, for a signal with a 90-second cycle, this means that the 95th percentile queue length will be exceeded during 2 of the 40 signal cycles that occur during the peak hour. The queue analysis results are summarized in **Table 11** for the analyzed peak hours.

TABLE 11
95TH PERCENTILE QUEUE ANALYSIS

Intersection	Movement	Storage Lengths	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Opening Year 2025		Opening Year 2025	
			Base	Projected	Base	Projected
Route 309 (S.R. 309) & Ridgeview Drive	EB L	50	<25	<25	<25	<25
	EB T	--	<25	<25	63	70
	EB R	60	38	38	138	138
	WB L	530	738	1065	343	483
	WB TR	--	45	60	38	48
	NB L	225	315	315	328	328
	NB TR	--	428	465	588	783
	SB L	225	<25	<25	<25	35
	SB TR	--	430	430	363	363
Ridgeview Drive & Bulldog Drive	WB L	120	<25	<25	<25	<25
	NB L/R	--	35	100	30	83
Walbert Avenue (S.R. 1006) & Ridgeview Drive	EB L	85	<25	<25	<25	<25
	EB TR	--	30	30	60	60
	WB L	125	48	48	58	58
	WB TR	--	25	25	73	73
	NB LT	--	<25	<25	98	98
	NB R	275	63	63	100	100
Bulldog Drive & Crackersport Road	WB L	50	<25	<25	<25	<25
	NB L/R	--	<25	<25	<25	<25
Crackersport Road & Winchester Road/Proposed Site Driveway	EB L/T/R	--	<25	<25	<25	<25
	WB L/T/R	--	<25	<25	<25	<25
	NB L/T/R	--	<25	<25	<25	<25
	SB L/T/R	--	<25	<25	<25	<25
Crackersport Road & Springhouse Road	EB L	--	<25	<25	<25	<25
	EB R	55	<25	25	<25	<25
	NB L	225	<25	30	<25	<25
	NB T	--	<25	<25	<25	<25
	SB T	--	<25	<25	<25	<25
	SB R	225	<25	<25	<25	<25
Springhouse Road & Winchester Road	EB L/T/R	--	<25	<25	<25	<25
	WB L/T/R	--	<25	<25	98	118
	NB L/T/R	--	58	65	255	310
	SB L/T/R	--	88	110	75	100

Queue analysis worksheets are included with the capacity analysis worksheets provided in **Appendix H**.

AUXILIARY TURN LANE ANALYSIS

TPD evaluated auxiliary turn lane warrants at the new site access intersection. The warrant analysis methodology contained within Chapter 11 of PennDOT's *Publication 46*, Section 11.17 was utilized for this evaluation. The results are summarized in **Table 12** below.

TABLE 12
AUXILIARY TURN LANE ANALYSIS SUMMARY

Intersection	Auxiliary Lane	Warrant Satisfied?		Required Lane Length	Proposed Lane Length
		A.M. Peak	P.M. Peak		
Crackersport Road & Winchester Road/Site Driveway	WB Left-Turn Lane	No	No	--	--
	EB Right-Turn Lane	No	No	--	--

The calculations for the auxiliary turn lane warrants are included in **Appendix J**.

INTERSECTION CONTROL EVALUATION

The intersection of Springhouse Road & Crackersport Road currently has stop signs on the eastbound approach. TPD conducted data collection and field observations at the intersection to assess whether all-way stop control may be more appropriate at the intersection.

All-Way Stop Warrant Analysis

The *Manual on Uniform Traffic Control Devices (MUTCD)*, Section 2B.07, "Multi-Way Stop Applications" contains provisions regarding the application of multi-way stop control at an intersection. The following provisions from the MUTCD were considered in reviewing the intersection for the application of multi-way stop control:

- (A) *Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*

This criterion is not applicable at this location.

- (B) *Minimum volumes:*

- (1) *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and*
- (2) *The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the maximum hour, but*
- (3) *If the 85th percentile approach speed of the major street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70% of the above values.*

The relevant traffic data is summarized in **Table 13** below.

TABLE 13
ALL-WAY STOP CONTROL WARRANT SUMMARY

Time Period	Projected Traffic Volumes				Warrant Criteria	
	Nortbound (Major)	Southbound (Major)	Northbound & Southbound Combined	Eastbound (Minor)	Major Street	Minor Street
12:00 AM	15	10	25	7	300 (N)	200 (N)
1:00 AM	7	4	11	4	300 (N)	200 (N)
2:00 AM	5	4	9	1	300 (N)	200 (N)
3:00 AM	5	4	9	2	300 (N)	200 (N)
4:00 AM	8	6	14	3	300 (N)	200 (N)
5:00 AM	47	36	83	15	300 (N)	200 (N)
6:00 AM	169	136	305	51	300 (Y)	200 (N)
7:00 AM	473	380	853	145	300 (Y)	200 (N)
8:00 AM	418	304	722	144	300 (Y)	200 (N)
9:00 AM	472	313	785	181	300 (Y)	200 (N)
10:00 AM	520	308	828	229	300 (Y)	200 (Y)
11:00 AM	699	396	1095	320	300 (Y)	200 (Y)
12:00 PM	444	386	830	95	300 (Y)	200 (N)
1:00 PM	408	354	762	89	300 (Y)	200 (N)
2:00 PM	606	535	1141	113	300 (Y)	200 (N)
3:00 PM	628	555	1183	114	300 (Y)	200 (N)
4:00 PM	571	500	1071	110	300 (Y)	200 (N)
5:00 PM	455	393	848	98	300 (Y)	200 (N)
6:00 PM	289	246	535	72	300 (Y)	200 (N)
7:00 PM	190	160	350	50	300 (Y)	200 (N)
8:00 PM	126	104	230	35	300 (N)	200 (N)
9:00 PM	69	56	125	22	300 (N)	200 (N)
10:00 PM	45	38	83	11	300 (N)	200 (N)
11:00 PM	26	22	48	6	300 (N)	200 (N)

As shown in Table 13, the projected traffic volumes at the intersection do not satisfy Criteria C.1 or C.2.

(A) *Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

This criterion is not satisfied. Criteria C.1 and C.2 are not satisfied to 80 percent of the minimum values.

The MUTCD also lists the following additional criteria that may also be considered in an engineering study for a multi-way stop sign installation:

(A) *The need to control left-turn conflicts;*

Based on field observations there are no left-turn conflicts that would be mitigated by multi-way stop control.

(B) *The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;*

No significant vehicle/pedestrian conflicts were observed at the intersection.

- (C) Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop;

A sight distance evaluation was performed at the intersection. Results are shown below.

- (D) An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

The two streets are both residential through streets of similar design and operating characteristics. TPD performed a level of service analysis at the intersection to evaluate the operational impact of changing the intersection control. The results are detailed below.

Sight Distance Analysis

Table 14 shows the measured, desirable, acceptable (SSSD), and required sight distances at the eastbound approach of Crackersport Road at Springhouse Road.

TABLE 14
SIGHT DISTANCE ANALYSIS
CRACKERSPORT ROAD EASTBOUND APPROACH AT SPRINGHOUSE ROAD

	Direction	Speed	Grade ¹	Sight Distances (feet)		
				DES	SSSD	EXIST
Exiting Movements	To the left	30 mph	-2%	345	201	500'
	To the right	30 mph	+2%	273	191	164'
Entering Left Turns	Approaching same direction	30 mph	+2%	245	191	500+
	Approaching opposite direction	30 mph	-2%	245	201	500+

DES = PennDOT Desirable Sight Distance
SSSD = PennDOT Acceptable Sight Distance

¹ = Roadway Grade Approaching Driveway
EXIST = Existing (measured) Sight Distance

As shown in **Table 14**, the available sight distance at the intersection does not meet PennDOT's sight distance standards.

Levels of Service (Delay) Analysis

Table 15 shows the operational analysis of the intersection of Crackersport Road at Springhouse Road. The Base and Projected analyses consider the current stop control configuration. The Projected with Improvements column depicts the levels of service considering and all-way stop control configuration.

TABLE 15
ALL-WAY STOP CONTROL LEVEL OF SERVICE DELAY (SECONDS) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Opening Year 2025			Opening Year 2025		
		Base	Projected	Proj with Imps	Base	Projected	Proj with Imps
Crackersport Road & Springhouse Road	EB L	D (32.4)	E (47.9)	B (11.8)	D (26.8)	D (33.8)	B (11.3)
	EB R	B (12.2)	B (12.8)	B (12.4)	B (12.3)	B (12.8)	B (10.9)
	NB L	B (11.0)	B (11.6)	B (14.6)	A (9.9)	B (10.2)	A (9.9)
	NB T	A (0.0)	A (0.0)	C (21.7)	A (0.0)	A (0.0)	E (35.6)
	SB T	A (0.0)	A (0.0)	D (26.9)	A (0.0)	A (0.0)	D (31.7)
	SB R	A (0.0)	A (0.0)	A (8.9)	A (0.0)	A (0.0)	A (8.0)
	ILOS	A (3.0)	A (4.4)	C (20.2)	A (1.3)	A (2.2)	D (29.3)

RECOMMENDATIONS AND CONCLUSIONS

Based on the results of the transportation impact study, TPD offers the following conclusions:

- The project scope and the extent of the study area were confirmed with representatives from the Township via email correspondence. The study area intersections included in this TIS are as follows:
 - » Route 309 & Ridgeview Drive;
 - » Ridgeview Drive & Bulldog Drive;
 - » Ridgeview Drive & Walbert Avenue;
 - » Bulldog Drive & Crackersport Road;
 - » Crackersport Road & Winchester Road;
 - » Crackersport Road & Springhouse Road;
 - » Springhouse Road & Winchester Road.
- The proposed project site is to be located on the property of the Parkview Inn. The proposed site is bound by Route 309 (S.R. 0309) to the west, Route 22 (S.R. 0022) to the south and Crackersport Road to the north.
- The proposed mixed-use development will consist of the following land uses: 360 apartments, 35 low-rise townhomes, an 8,000 SF daycare facility and 15,540 square feet (SF) of retail space.
- Access to the site will be served by two full-access driveways: one existing driveway at the intersection of Bulldog Drive and Crackersport Road and one proposed driveway on Crackersport Road aligned directly opposite Winchester Road.
- Under the 2025 projected conditions all approaches and turning movements at the site driveway intersections with the external roadway network will operate at LOS B or better during weekday A.M. and weekday P.M. peak hours.
- The available sight distance at the proposed new site driveway location will exceed PennDOT's desirable and safe stopping sight distance (SSSD) criteria.

7. Upon full build-out, the proposed development is expected to generate 330 new vehicle-trips during the weekday A.M. peak hour and 333 new vehicle-trips during the weekday P.M. peak hour.
8. All study area intersections will operate at an acceptable overall intersection level of service (ILOS) D or better under the 2025 projected condition scenarios with the exception of the intersection of Route 309 & Ridgeview Drive during the AM peak hour.
9. Traffic Planning and Design Inc. (TPD) recommends the following roadway improvements at the site access study area intersection with Crackersport Road:

Crackersport Road & Winchester Road/Proposed Full-Access Driveway

- » Provide a stop sign (PennDOT designation R1-1) to control traffic;
 - » Design the driveway with sufficient width and radii to accommodate the anticipated traffic utilizing the access.
10. Given the current configuration of the intersection and the results of the all-way stop analysis performed at the intersection of Springhouse Road & Crackersport Road, the Township may wish to consider pursuing the installation of all-way stop control at this intersection.
 11. Levels of Service (LOS) for the study area intersections have been summarized in matrix form. **Table I** details the overall intersection LOS for each study area intersection.
 12. With the implementation of the site-related recommendations, it is TPD's opinion that the construction of the proposed development will not adversely affect the health, safety, and welfare of the community from a traffic engineering perspective.

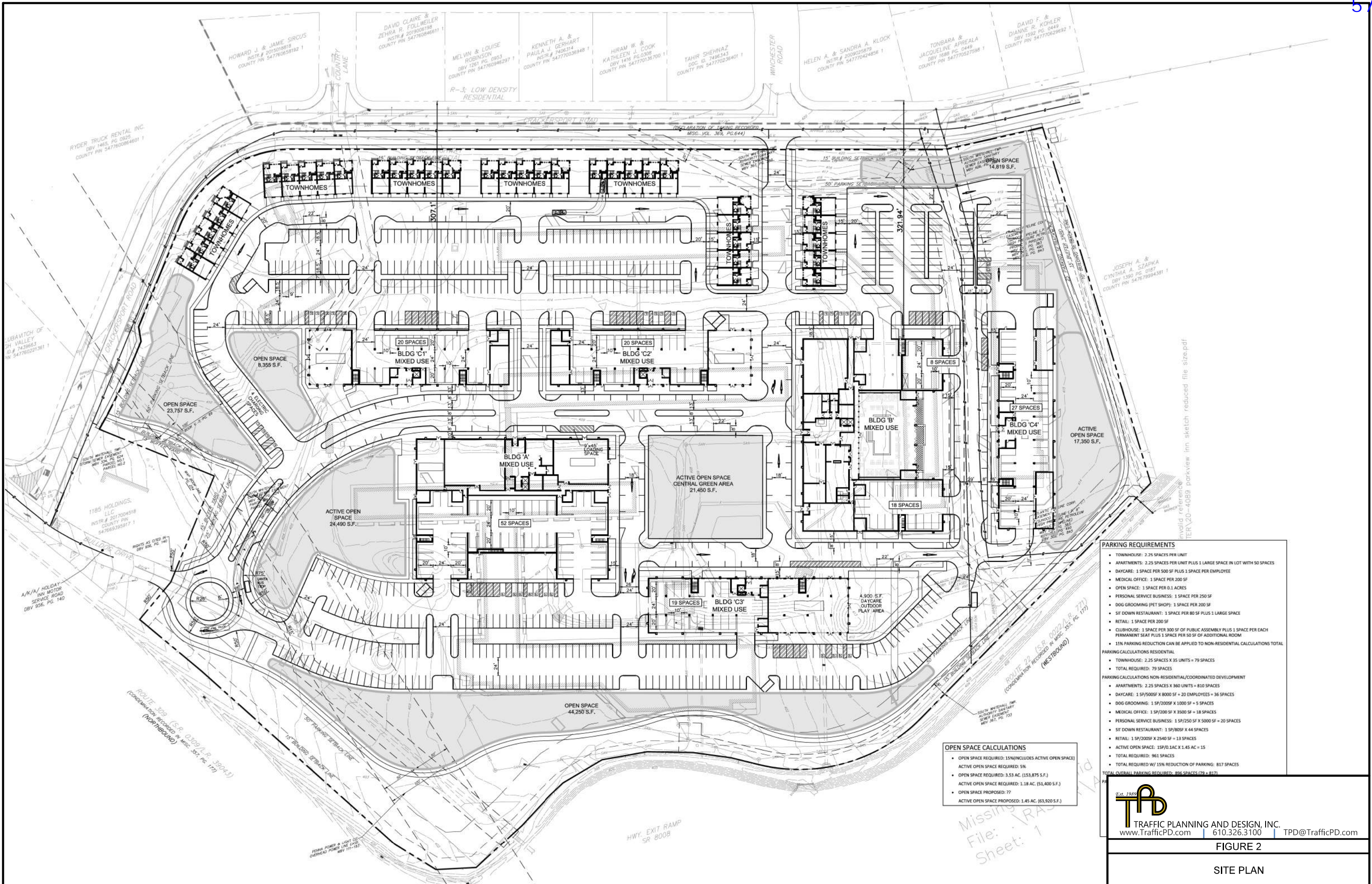


 = STUDY INTERSECTIONS


TRAFFIC PLANNING AND DESIGN, INC.
www.TrafficPD.com | 610.326.3100 | TPD@TrafficPD.com

FIGURE 1

PROJECT LOCATION



- PARKING REQUIREMENTS**
- TOWNHOUSE: 2.25 SPACES PER UNIT
 - APARTMENTS: 2.25 SPACES PER UNIT PLUS 1 LARGE SPACE IN LOT WITH 50 SPACES
 - DAYCARE: 1 SPACE PER 500 SF PLUS 1 SPACE PER EMPLOYEE
 - MEDICAL OFFICE: 1 SPACE PER 200 SF
 - OPEN SPACE: 1 SPACE PER 0.1 ACRES
 - PERSONAL SERVICE BUSINESS: 1 SPACE PER 250 SF
 - DOG GROOMING (PET SHOP): 1 SPACE PER 200 SF
 - SIT DOWN RESTAURANT: 1 SPACE PER 80 SF PLUS 1 LARGE SPACE
 - RETAIL: 1 SPACE PER 200 SF
 - CLUBHOUSE: 1 SPACE PER 300 SF OF PUBLIC ASSEMBLY PLUS 1 SPACE PER EACH PERMANENT SEAT PLUS 1 SPACE PER 50 SF OF ADDITIONAL ROOM
 - 15% PARKING REDUCTION CAN BE APPLIED TO NON-RESIDENTIAL CALCULATIONS TOTAL

- PARKING CALCULATIONS RESIDENTIAL**
- TOWNHOUSE: 2.25 SPACES X 35 UNITS = 79 SPACES
 - TOTAL REQUIRED: 79 SPACES
- PARKING CALCULATIONS NON-RESIDENTIAL/COORDINATED DEVELOPMENT**
- APARTMENTS: 2.25 SPACES X 360 UNITS = 810 SPACES
 - DAYCARE: 1 SP/500SF X 8000 SF + 20 EMPLOYEES = 36 SPACES
 - DOG GROOMING: 1 SP/200SF X 1000 SF = 5 SPACES
 - MEDICAL OFFICE: 1 SP/200 SF X 3500 SF = 18 SPACES
 - PERSONAL SERVICE BUSINESS: 1 SP/250 SF X 5000 SF = 20 SPACES
 - SIT DOWN RESTAURANT: 1 SP/80SF X 44 SPACES
 - RETAIL: 1 SP/200SF X 2540 SF = 13 SPACES
 - ACTIVE OPEN SPACE: 1SP/0.1AC X 1.45 AC = 15
 - TOTAL REQUIRED: 961 SPACES
 - TOTAL REQUIRED W/ 15% REDUCTION OF PARKING: 817 SPACES
 - TOTAL OVERALL PARKING REQUIRED: 896 SPACES (79 + 817)

- OPEN SPACE CALCULATIONS**
- OPEN SPACE REQUIRED: 15%(INCLUDES ACTIVE OPEN SPACE)
 - ACTIVE OPEN SPACE REQUIRED: 5%
 - OPEN SPACE REQUIRED: 3.53 AC. (153,875 S.F.)
 - ACTIVE OPEN SPACE REQUIRED: 1.18 AC. (51,400 S.F.)
 - OPEN SPACE PROPOSED: ??
 - ACTIVE OPEN SPACE PROPOSED: 1.45 AC. (63,920 S.F.)

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FIGURE 2

SITE PLAN

Missing: TRAFFIC PLAN
 File: TRAFFIC PLAN
 Sheet: 1

Invalid reference
 TRF\20-4089 parkview lin sketch reduced file size.pdf

HWY. EXIT RAMP
 SR 8008

ROUTE 308 (S.R. 0202) (R. 38043)
 (CONGRESSIONAL RECORD IN MISC. 557, PG. 177)
 (NORTHBOUND)

ROUTE 22 (S.R. 0022) (R. 77)
 (CONGRESSIONAL RECORD IN MISC. 557, PG. 177)
 (WESTBOUND)

RYDER TRUCK RENTAL INC.
 DBV 1485, PG. 0525
 COUNTY PIN 547760084601

LUBAVITCH OF
 CH. VALLEY
 ID # 7439663
 PIN 547760221961

1185 HOLDINGS,
 LLC
 INSTR # 2017004518
 COUNTY PIN 547669393917

A/K/A HOLIDAY
 INN MOTOR
 SERVICE ROAD
 DBV 956, PG. 140

PERNA POWER & LIGHT CO.
 SUBMITTAL TO THE
 STATE DEPARTMENT
 DBV 111-132

SOUTH WINTHALL IMP.
 SUBMITTAL TO THE
 STATE DEPARTMENT
 DBV 367, PG. 753

JOSEPH A. &
 CYNTHIA A. SZAFKA
 DBV 1390 PG. 0157
 COUNTY PIN 547679994391

HELEN A. & SANDRA A. KLOCK
 INSTR # 2020025579
 COUNTY PIN 547770424858 1

TONBARA &
 JACQUELINE APREALA
 DBV 1688 PG. 0449
 COUNTY PIN 547770527598 1

DAVID F. &
 DIANNE R. KOHLER
 DBV 1592 PG. 0449
 COUNTY PIN 547770629692 1

TAHIR SHEHNAZ
 SOC. ID. 7496343
 COUNTY PIN 547770236401 1

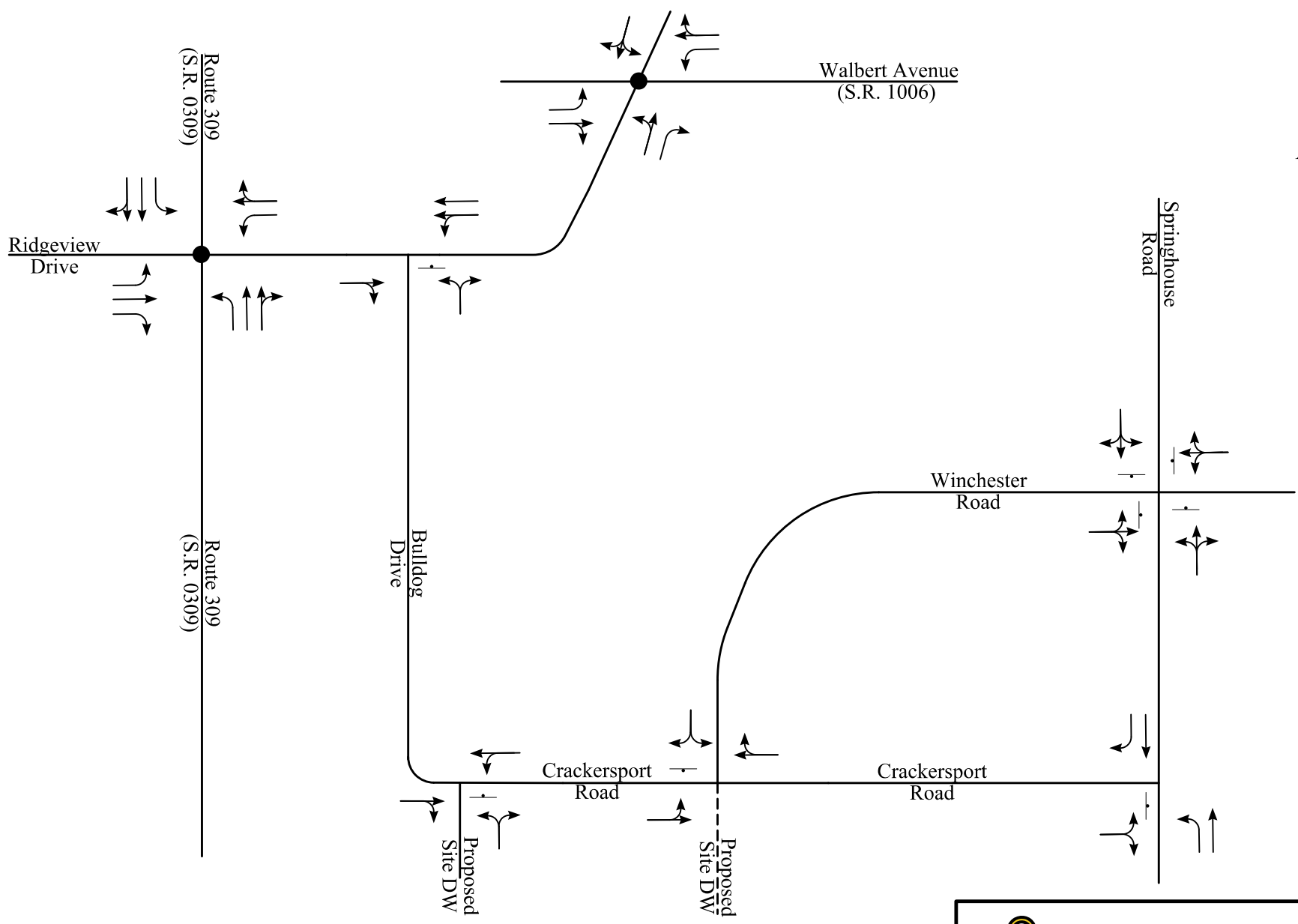
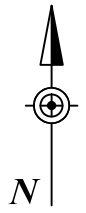
HIRAM W. &
 KATHLEEN J. COOK
 DBV 1416 PG. 0308
 COUNTY PIN 547770136700 1

KENNETH A. &
 PAULA J. GERHART
 INSTR # 7408314
 COUNTY PIN 547770039948 1

MELVIN & LOUISE
 ROBINSON
 DBV 1261 PG. 0953
 COUNTY PIN 547769946297 1

DAVID CLAIRE &
 ZEHRA R. FOLLWEILER
 INSTR # 2019006198
 COUNTY PIN 54776084611 1

HOWARD J. & JAMIE SIRCUS
 INSTR # 201508818
 COUNTY PIN 54776058192 1



KEY:
 T-junction symbol: STOP CONTROLLED
 ●: SIGNALIZED INTERSECTION
 - - - - : PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE


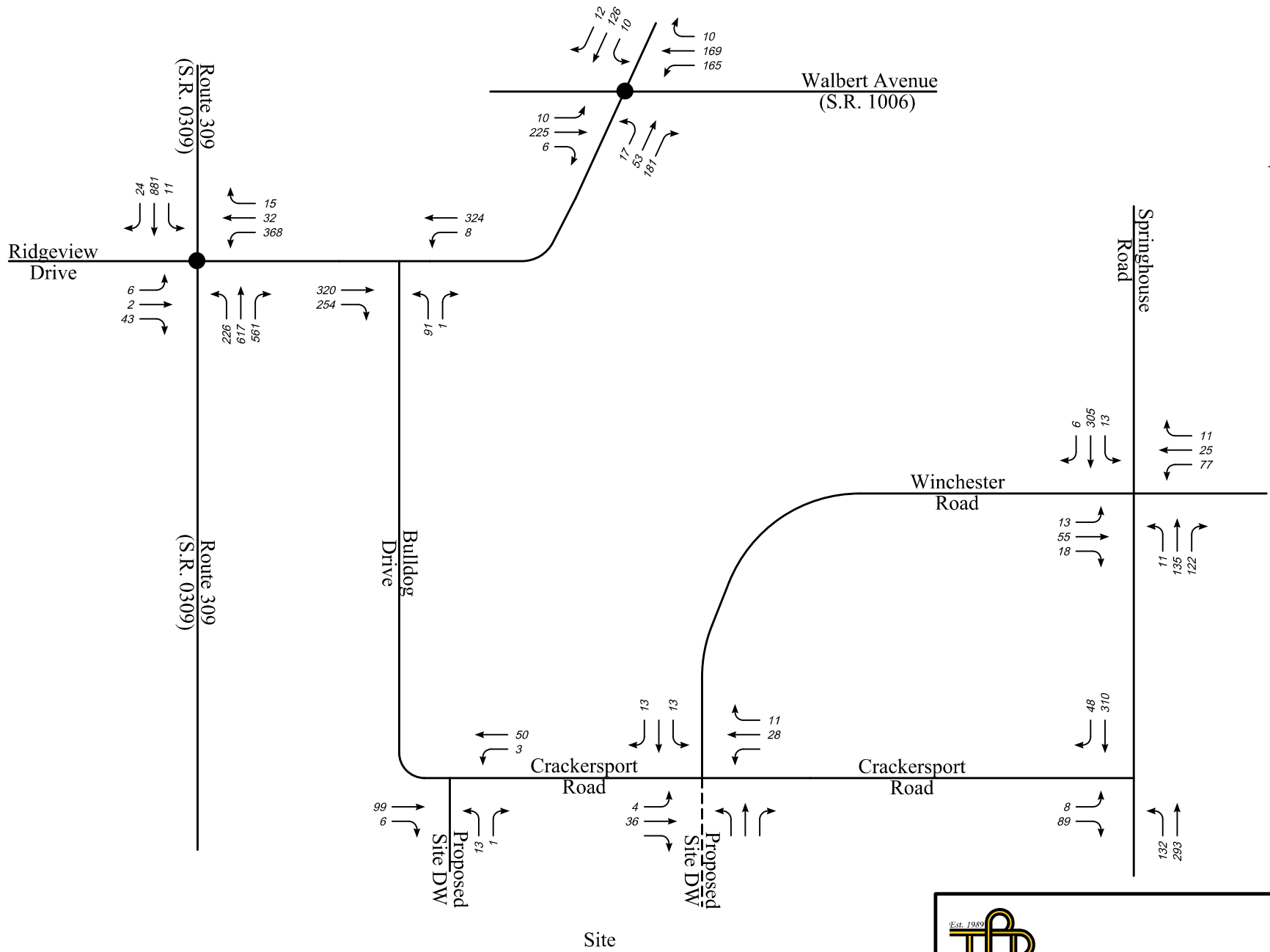
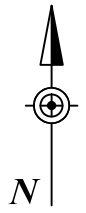

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FIGURE 3

EXISTING LANE CONFIGURATIONS AND INTERSECTION CONTROL



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE


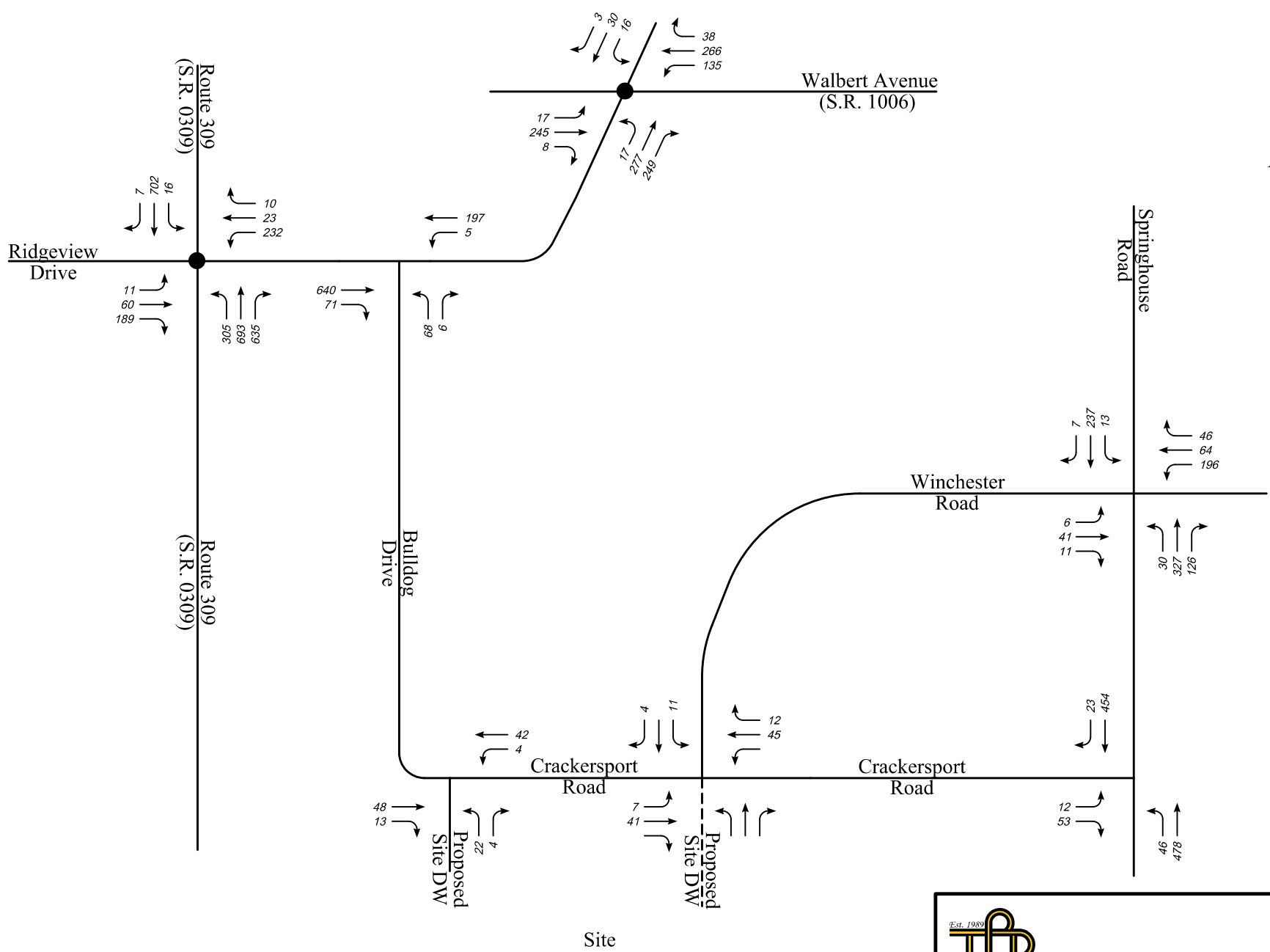
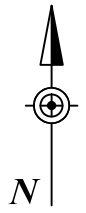

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FIGURE 4

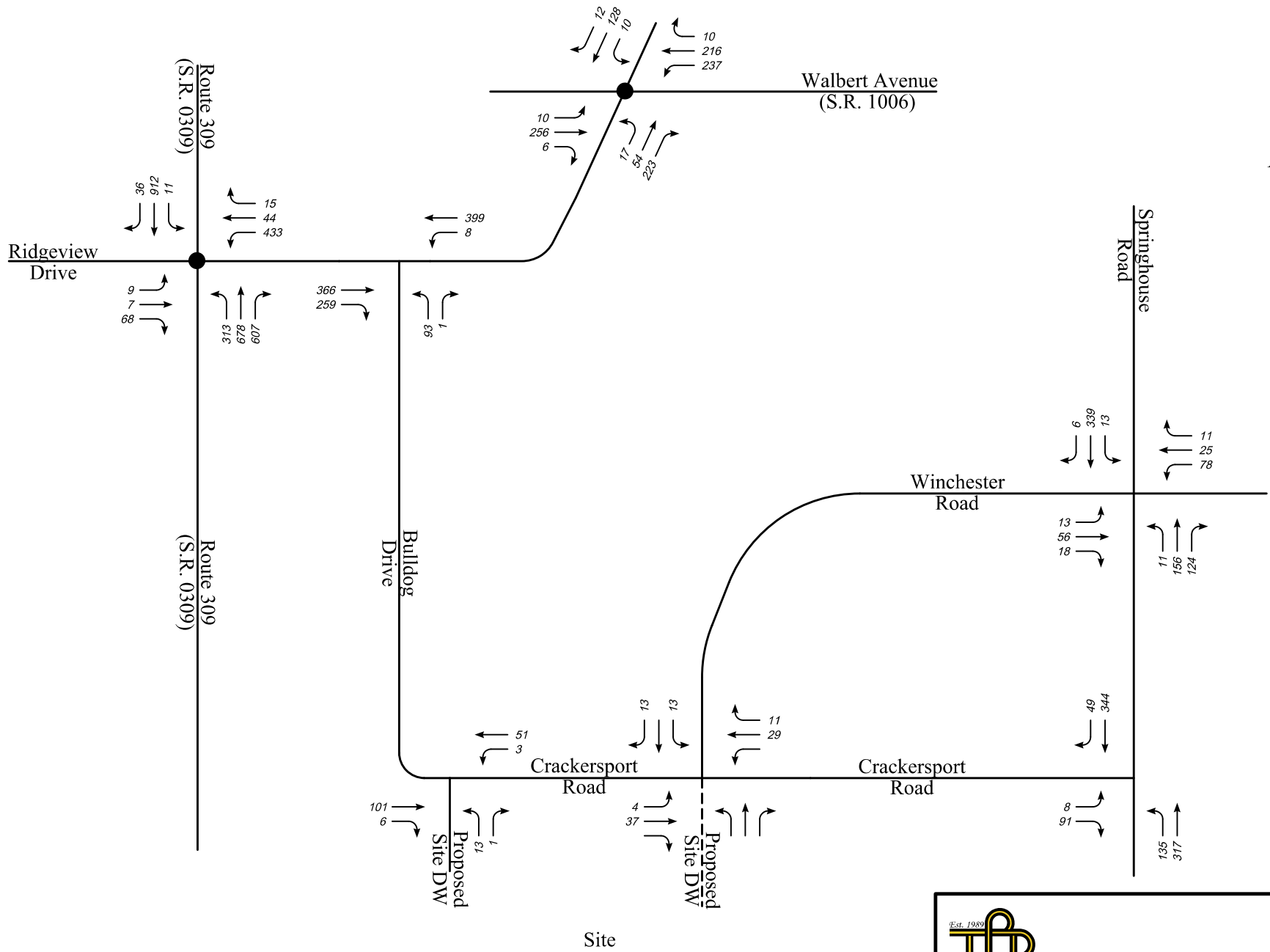
**EXISTING CONDITIONS
 WEEKDAY A.M. PEAK HOUR
 TRAFFIC VOLUMES**




KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

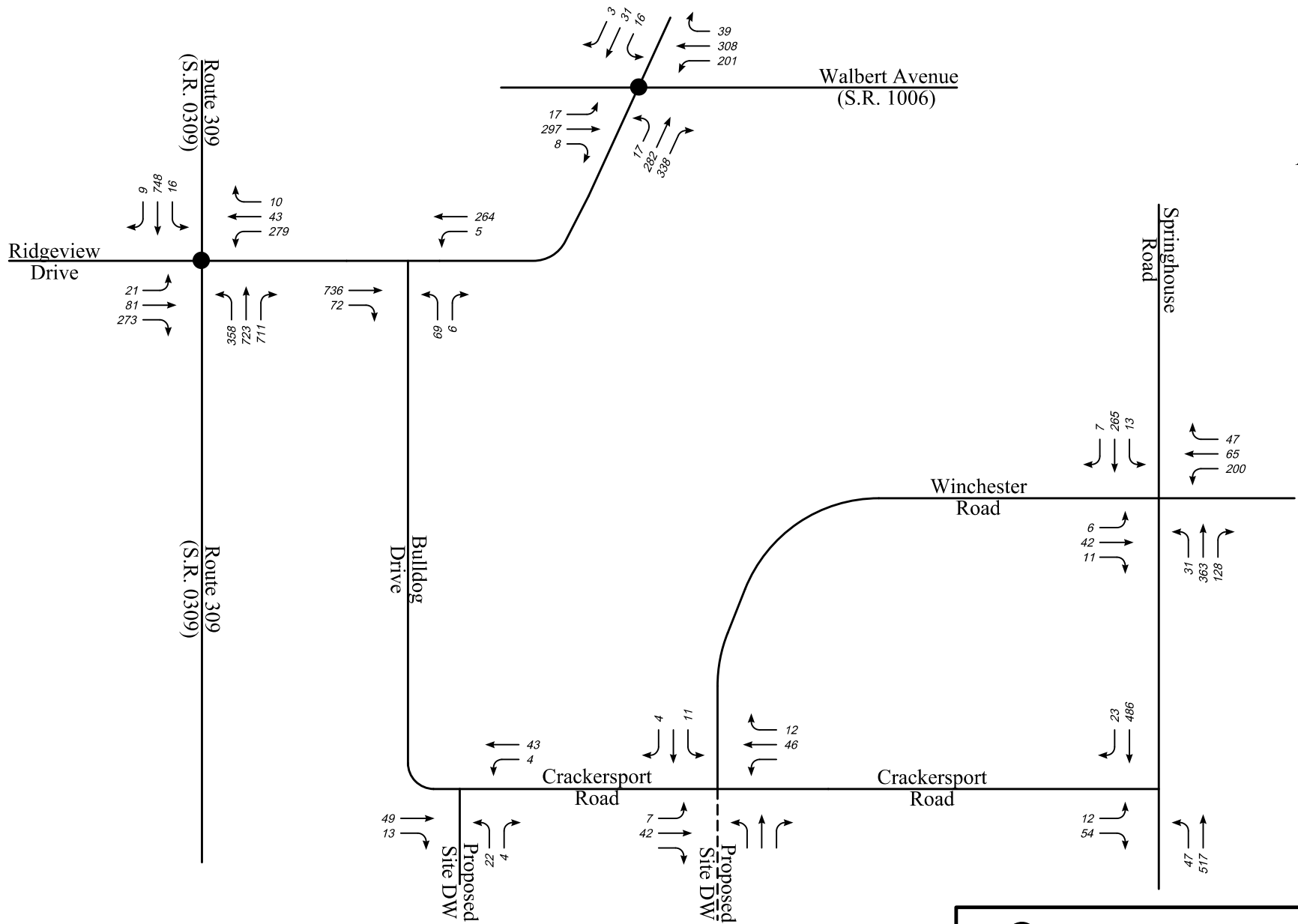
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FIGURE 5
 EXISTING CONDITIONS
 WEEKDAY P.M. PEAK HOUR
 TRAFFIC VOLUMES



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

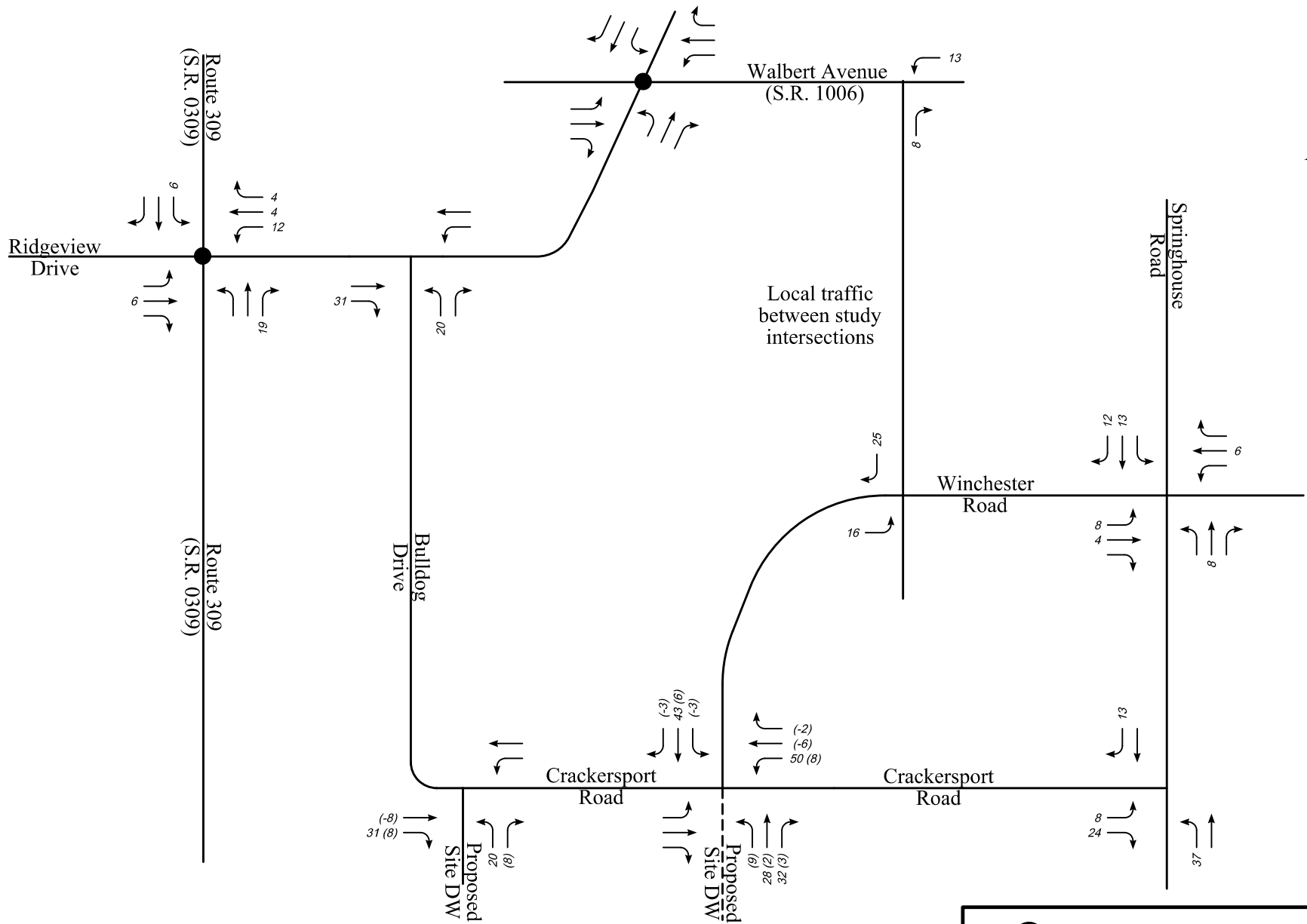

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FIGURE 6
 2025 BASE CONDITIONS
 WEEKDAY A.M. PEAK HOUR
 TRAFFIC VOLUMES



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 SCHEMATIC DRAWING: NOT TO SCALE

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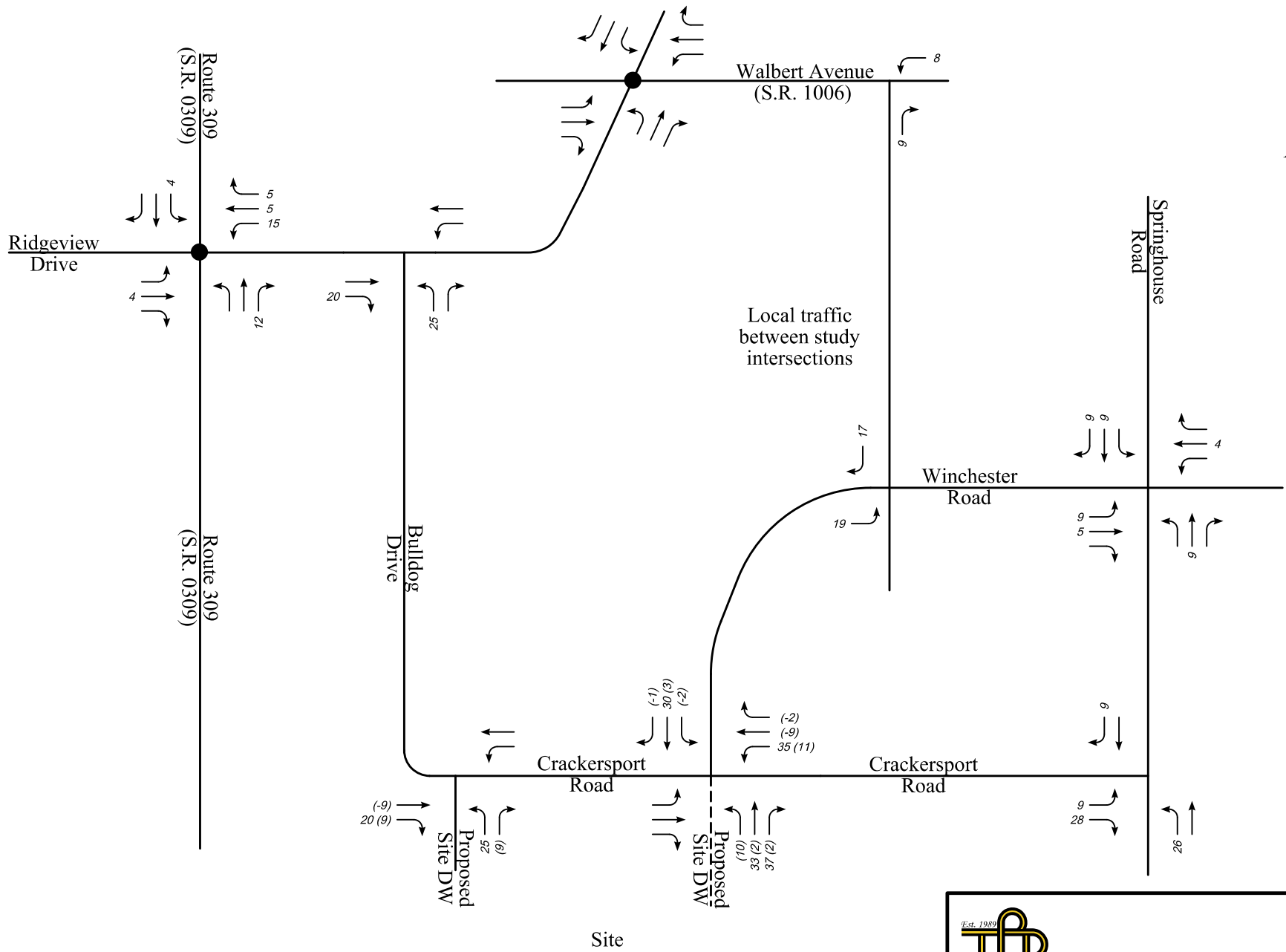
FIGURE 7
 2025 BASE CONDITIONS
 WEEKDAY P.M. PEAK HOUR
 TRAFFIC VOLUMES



Site
 ENTER: 124 (22)
 EXIT: 80 (22)

KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

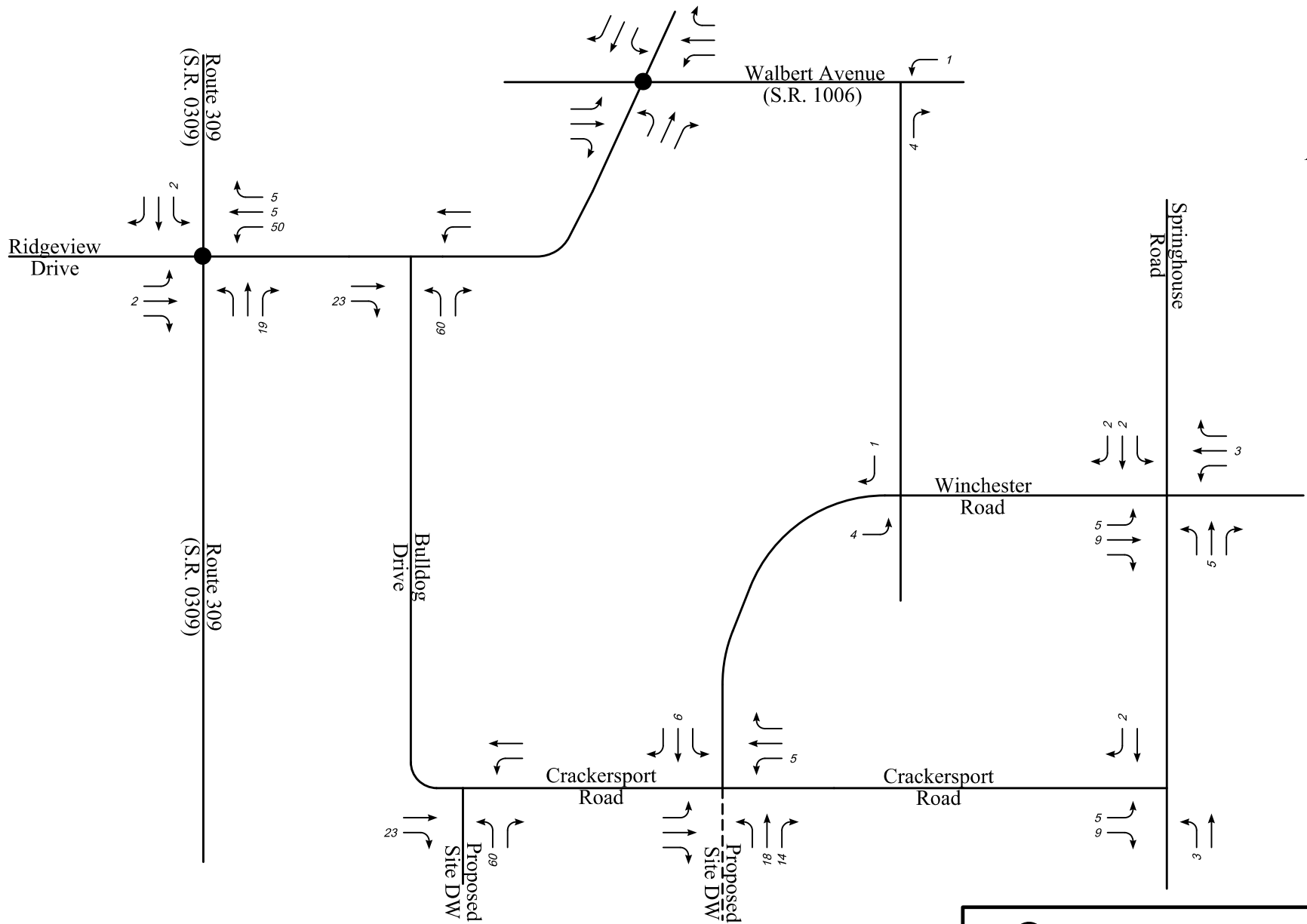
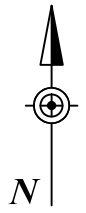
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 SCHEMATIC DRAWING: NOT TO SCALE


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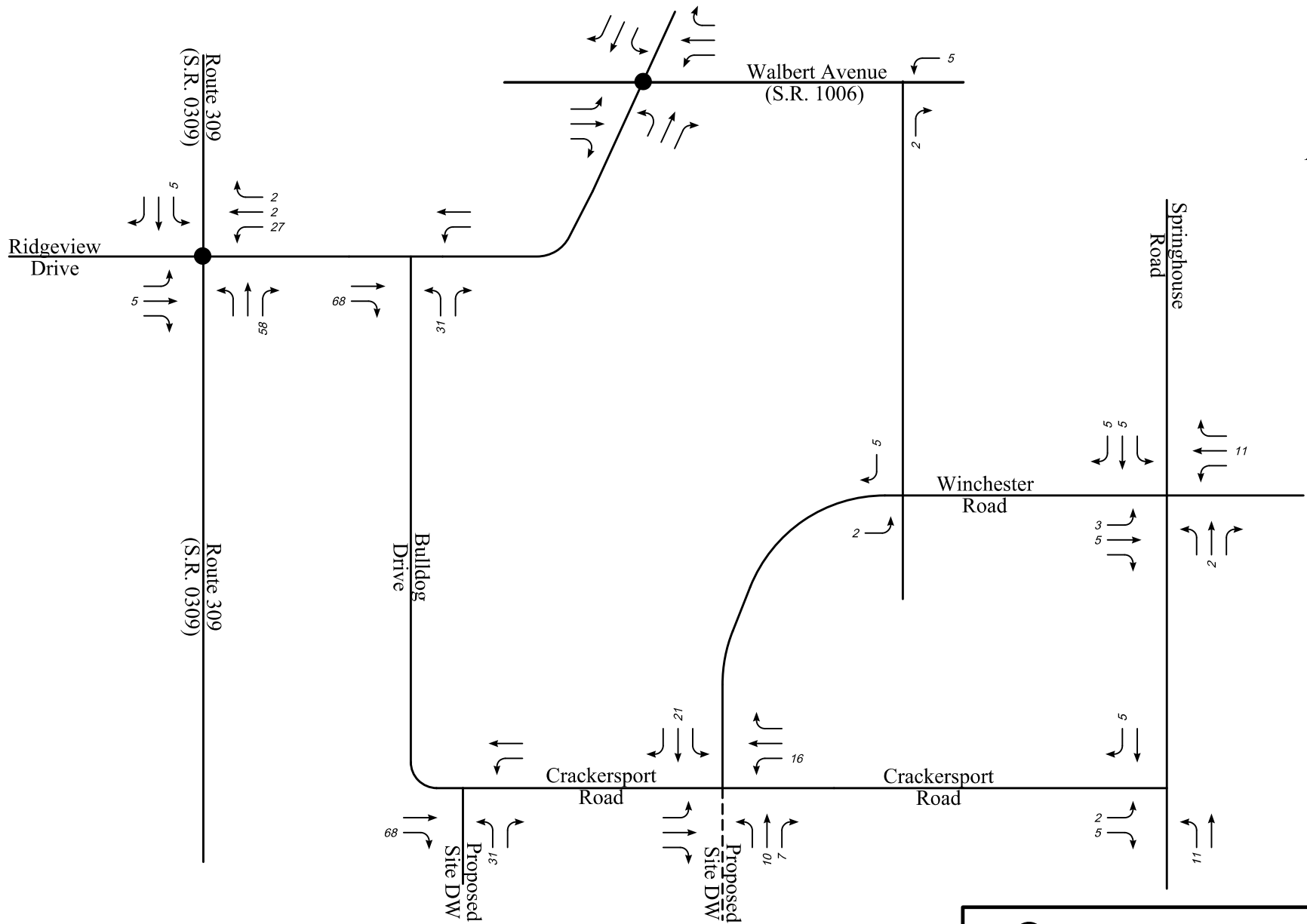
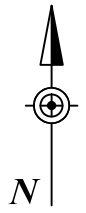
FIGURE 9
 RETAIL TRIP DISTRIBUTION
 WEEKDAY P.M. PEAK HOUR
 NEW (PASS-BY TRIPS)




Site
 ENTER: 34
 EXIT: 92

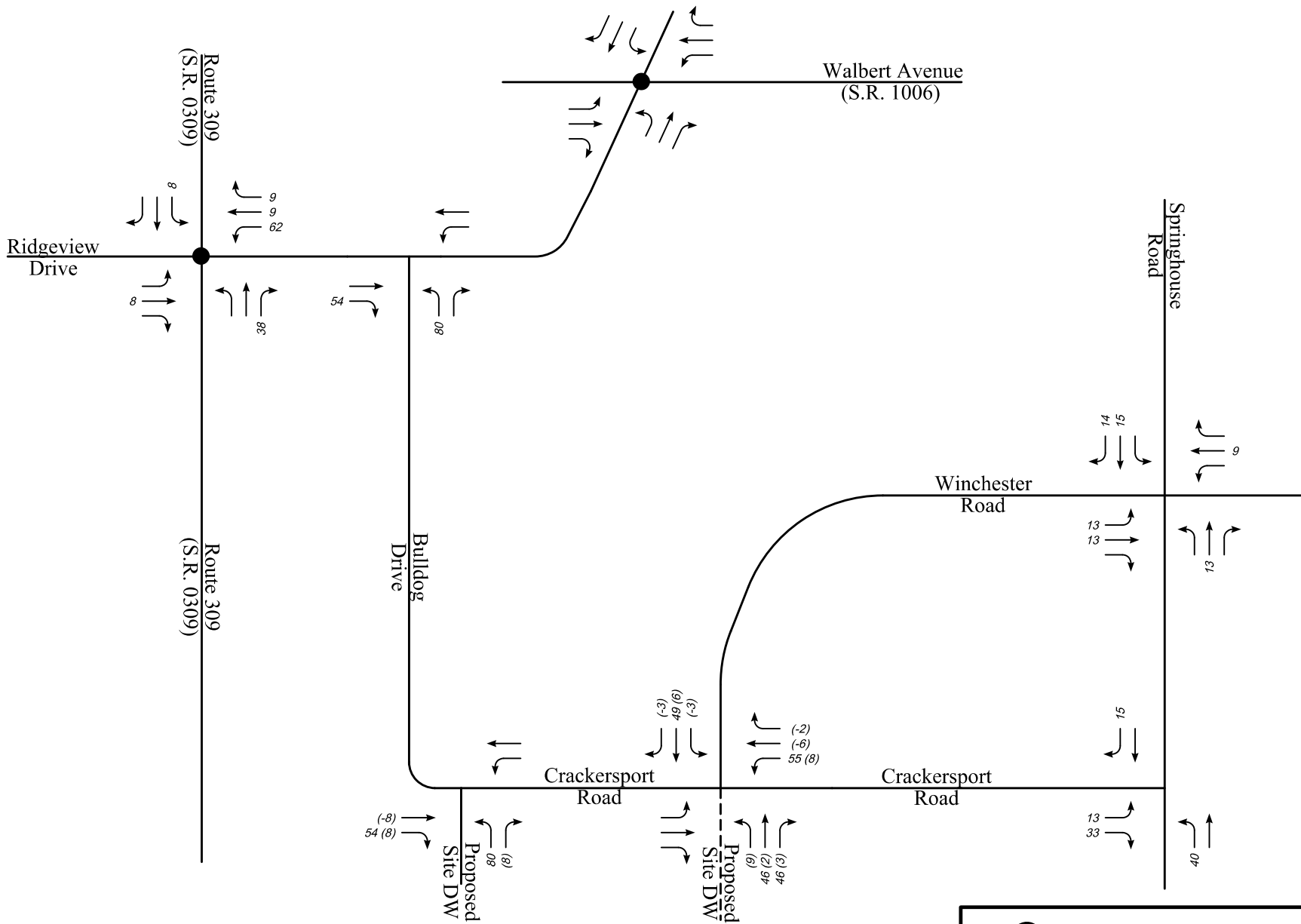
KEY:
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 SCHEMATIC DRAWING: NOT TO SCALE

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FIGURE 10
 RESIDENTIAL TRIP DISTRIBUTION
 WEEKDAY A.M. PEAK HOUR
 NEW TRIPS

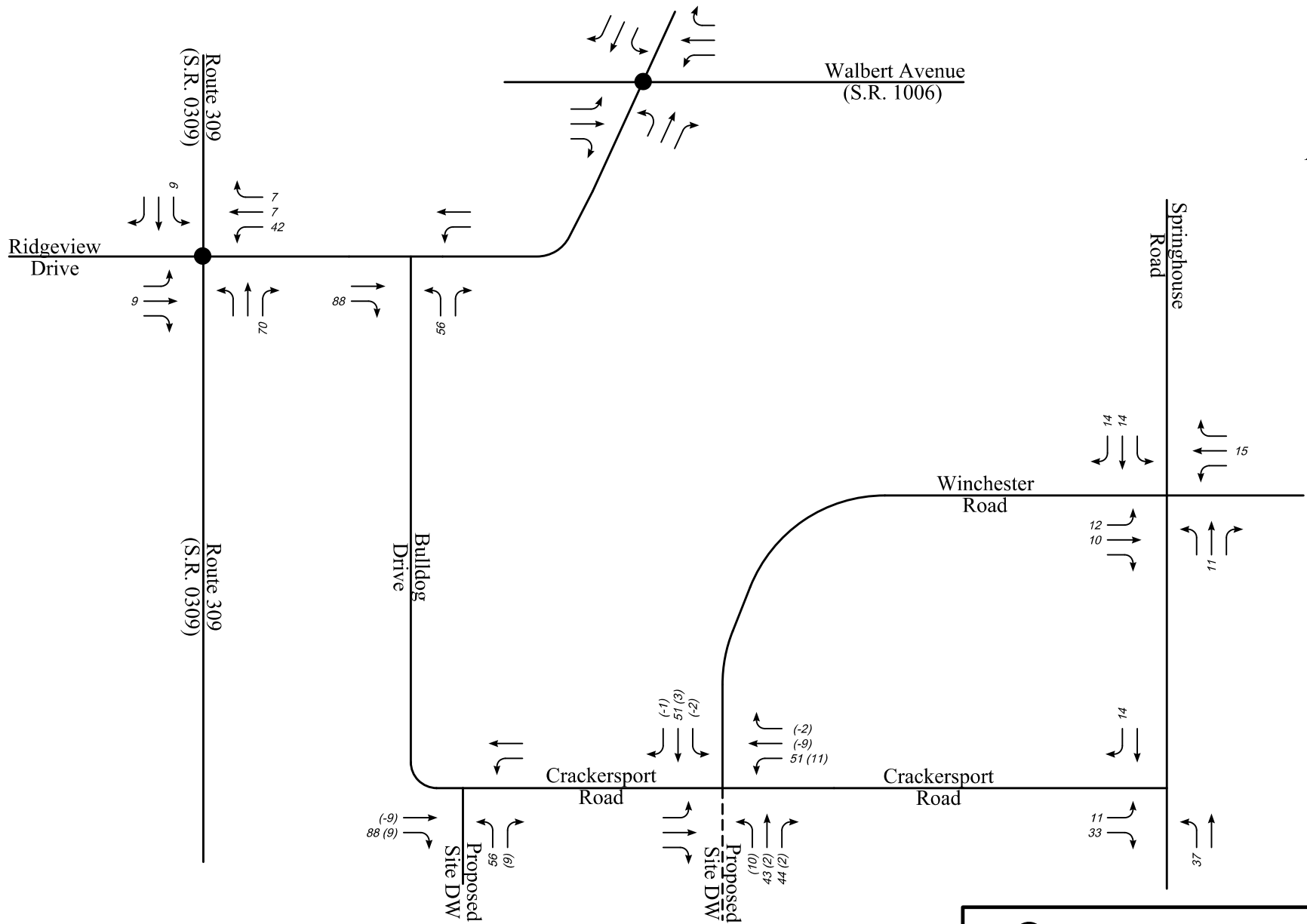


Site
 ENTER: 158 (22)
 EXIT: 172 (22)


KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

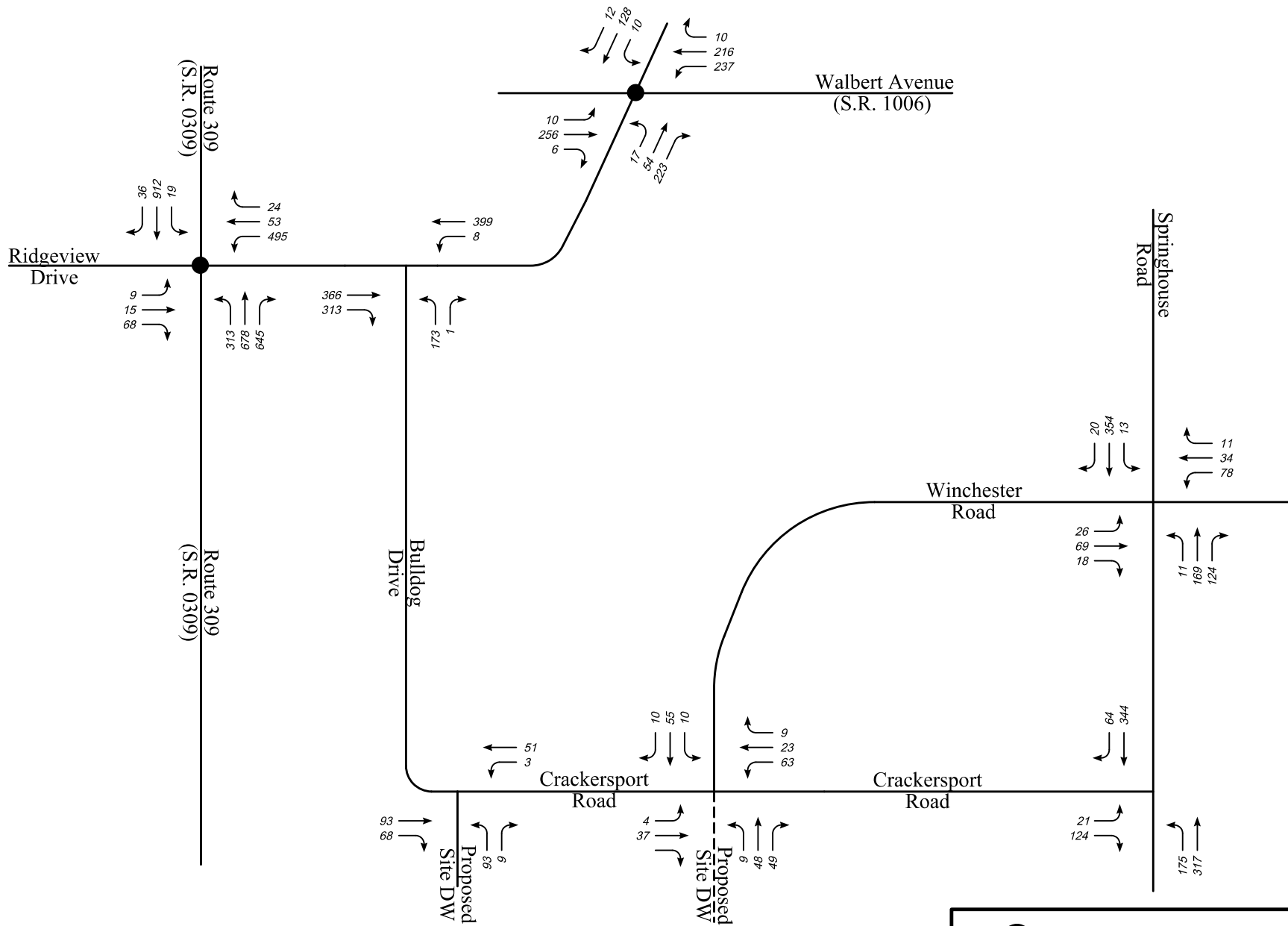
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FIGURE 12
 TOTAL SITE TRIP DISTRIBUTIONS
 WEEKDAY A.M. PEAK HOUR
 NEW (PASS-BY TRIPS)



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

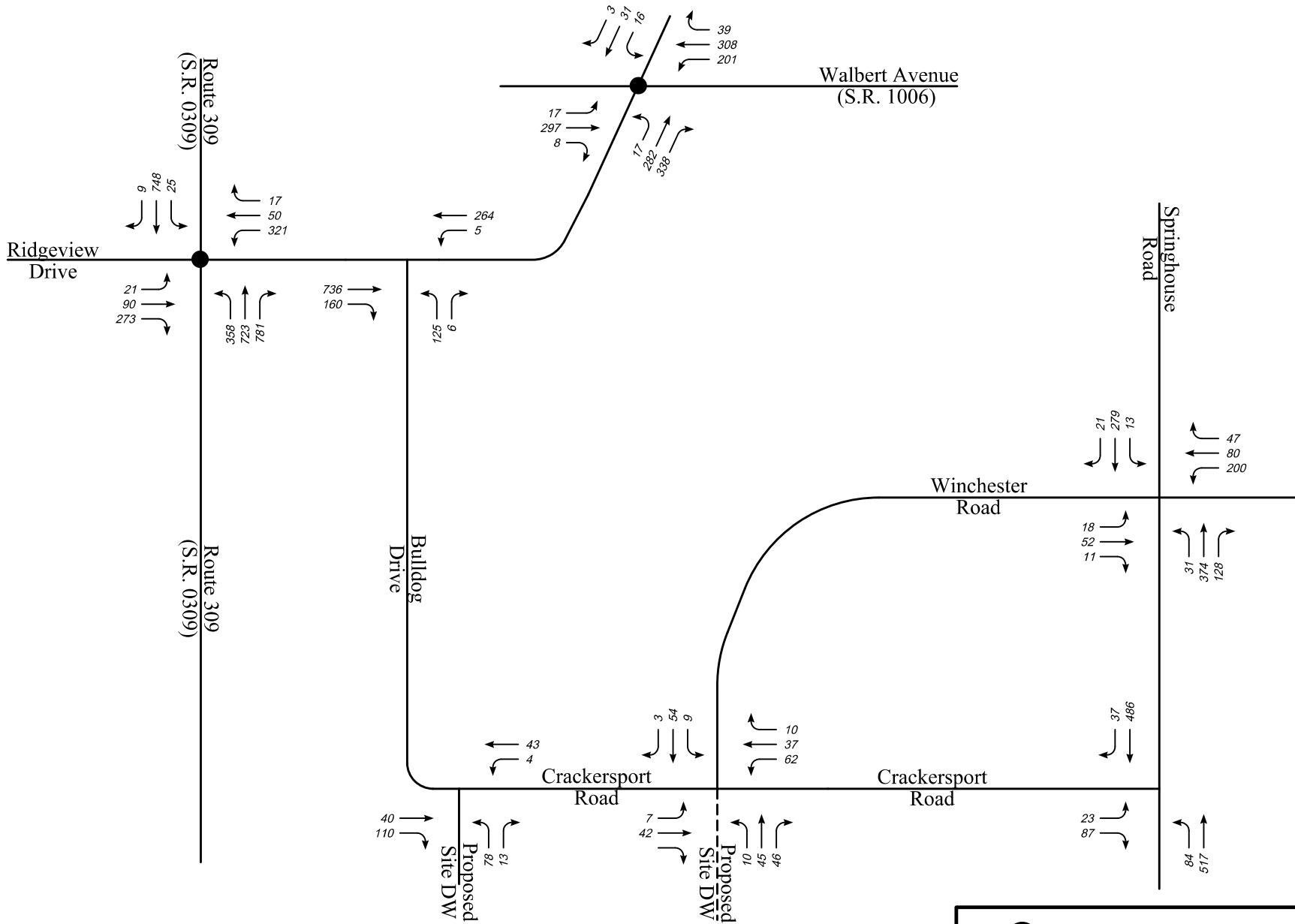
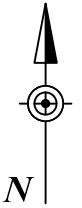

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FIGURE 13
 TOTAL SITE TRIP DISTRIBUTIONS
 WEEKDAY P.M. PEAK HOUR
 NEW (PASS-BY TRIPS)



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

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FIGURE 14
 2025 PROJECTED CONDITIONS
 WEEKDAY A.M. PEAK HOUR
 TRAFFIC VOLUMES



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

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FIGURE 15

2025 PROJECTED CONDITIONS
 WEEKDAY P.M. PEAK HOUR
 TRAFFIC VOLUMES

APPENDIX A:

Project Correspondence



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January 19, 2021

Mr. Gregg R. Adams
 South Whitehall Township
 4444 Walbert Avenue
 Allentown, PA 18104

Re: **Response to Township Engineer Comments**
 Parkview Inn Site Redevelopment
 South Whitehall Township, Lehigh County, PA
 TPD# BOYC.00003

Dear Mr. Adams:

Traffic Planning and Design, Inc. (TPD) has completed its responses to comments provided by The Pidcock Company, dated December 14, 2020, relative to the Traffic Impact Study comments contained in the Pidcock review letter. The comments relevant to the Traffic Impact Study from the December 14, 2020 review letter are shown below in bold type, with our corresponding responses following. It should be noted that the other comments from the review letter were previously addressed in a response from Barry Isett & Associates.

A. Traffic

1. The following comments relate to the Transportation Impact Study (TIS) and Supplemental Analyses, submitted in the support of the Conditional Use, ZO §350-18(b)(1)(H):

a. We note the following at the Route 309 and Ridgeview Drive Intersection:

- i. During the AM Peak, the westbound left turn movement exceeds capacity in both the 2025 Base conditions (volume to capacity ratio of 1.16) and the 2025 Projected condition (v/c of 1.37). The LOS degrades from LOS F (133.2 seconds of delay per vehicle) to LOS F (216.9 seconds per vehicle) in the AM Peak and from LOS E to LOS F (101.2 seconds per vehicle) in the PM Peak;**

So noted.

- ii. Also during the AM Peak, the westbound left turn movement queue length is anticipated to increase from 738 feet in the no build conditions to 1,100 feet in the build condition. While the volume of westbound left turn movements into Bulldog Drive is low (21 and 18), these vehicles will be using the same left turn lane and are not included in the 1,100-foot queue. Further, a portion of the required 1,100-foot queue results from northbound Bulldog Drive left-turning vehicles. We recommend that a microsimulation of these intersections be prepared (see below Comment No. 2);**

TPD has concerns with the microsimulation model and we feel it is not accurately representing the traffic conditions. Therefore, we would like to discuss the simulation results with the Township Engineer.

- iii. **During the PM Peak hour, the northbound through/right turn movement is shown to degrade from LOS D to LOS F (72.0 seconds per vehicle); and**

So noted.

- iv. **During the AM Peak hour, the overall intersection LOS is anticipated to degrade for LOS D (50.8 seconds per vehicle) to LOS E (66.7 seconds per vehicle).**

So noted.

- b. **At the Ridgeview Drive and Bulldog Drive intersection, the northbound left/right movement degrades from LOS C to LOS E during the AM Peak and from LOS C to LOS F (52.4 seconds per vehicle) during the PM Peak. Given the close proximity of this intersection to Route 309 and the capacity analysis limitations which assume free-flow movements, a microsimulation of the intersections should be prepared and compared for the no-build and build conditions to demonstrate the potential mitigation improvements;**

See response to 1.a.ii relative to the microsimulation.

- c. **The Recommendations and Conclusions section of the Study discussed an all-way stop control at the Springhouse Road and Crackersport Road intersection. We request TPD provide a warrant analysis to implement an all-way stop at this intersection as mitigation for the eastbound left turn movement that degrades from LOS E to LOS F (56.1) during the AM Peak;**

As requested, the revised TIS includes an all-way stop warrant analysis.

- d. **We previously requested a new Automatic Traffic Recorder (ATR) count be performed for Springhouse Road as it appears the tubes were damaged or counter malfunctioned.**

As requested, ATR counts were performed for an additional week. Growth rates due to COVID-19 were recalculated using the average peak hour from the weekday counts conducted.

- e. **The last paragraph in the COVID-19 adjustments section of the Study notes our acceptance of the methodology to adjust the traffic volumes. It should be noted that while we concurred with the methodology, we commented that additional data was necessary to confirm the magnitude of the count adjustment;**

So noted.

- f. **The ITE Trip Generation Data provided in Table 6 lists 33 Low-Rise Multi-Family Housing units while the Plans and Executive Summary show 35 units. The Plans and Study should be revised as necessary to be consistent.**

As requested, the study has been updated with 35 low-rise housing units.

- g. **The percentages provided for the Trip Distribution Assumptions for Jobs Located in Each Municipality for South Whitehall township in the Volume Development Worksheets equals 80 percent (30+5+20+25). The percentages should be revised to total 100 percent.**

As requested, the reports have been updated accordingly.

- h. **The following comments pertain to the pass-by trip assignments.**

- i. **The pass-by trips only account for traffic along Ridgeview Drive and Springhouse Road. Based on existing volumes and destinations, it appears the majority of pass-by traffic should be assigned to Route 309, with less Springhouse Road and Ridgeview Drive;**

- ii. **The new trips along Springhouse Road are split between Winchester Road and Crackersport Road while the pass-by trips are all assigned to Crackersport Road. Further justification should be provided for the inconsistent trips assignments; and**
- iii. **The number of pass-by trips shown on Figure 12 includes 44 trips entering and exiting the site while 40 trips are assigned to the roadway network entering and existing the site. Further, the number of pass-by trips during the AM Peak should only be entering and 39 exiting trips.**

TPD discussed these comments with the Township Engineer prior to resubmission. The trip generation and trip distribution assumptions were reassessed for the commercial trips to better represent the nature of the proposed retail development. We expect that the proposed retail will be neighborhood-oriented small-scale businesses and will not attract regional traffic. Therefore, we increased the amount of traffic to/from nearby local streets and reduced the number of trips to/from regional highways to 25 percent. TPD also applied a lower pass-by reduction and assumed that a greater percentage of the commercial trips would be "new" trips rather than pass-by trips. The Township Engineer concurred with this revised methodology.

- i. **The new trips entering and exiting the site should be revised as necessary to be consistent with the trip generation (e.g., AM entering trip generation is 141, trip assignment is 125). Additionally, rounding between intersections should be reviewed and revised as necessary;**

As requested, the trip distribution figures have been updated accordingly.

- j. **Based on the Trip Distribution Percentages provided in Table 8 for the Retail, 30 percent of traffic should be entering to and exiting from the east on Walbert Avenue. The trip assignments should be reviewed and revised, as necessary. Additionally, the assignments for the Walbert Avenue east trips appear different for the residential and retail distributions. Justification should be provided for the differences in the distributions.**

As requested, TPD revised the TIS to reflect similar travel routes for retail and commercial traffic to/from the east on Walbert Avenue. TPD assumed that traffic towards Walbert Avenue would use one of three routes: (1) Crackersport Road to Springhouse Road, (2) Winchester Road to Springhouse Road, and (3) Winchester Road to Hampton Road or N. 40th Street.

- k. **The following comments pertain to the capacity analyses:**

- i. **The peak hour factor identified in the 2017 existing traffic counts during the PM Peak for the Walbert Avenue and Ridgeview Drive intersections is 0.95 while the capacity analyses used 0.98. The peak hour factor should be revised to be consistent with the traffic counts; and**

As requested, the PM peak hour factor has been updated to 0.95.

- ii. **We note during the PM Peak hour, the heavy vehicle percentage for the southbound through movement at the Walbert Avenue and Ridgeview Drive intersection based on the traffic counts should be 3 percent while the capacity analyses used 0 percent. The percentages at the Ridgeview Drive and Bulldog Drive intersection also appear to be incorrect in the analyses during the PM Peak.**

The PM peak hour heavy vehicle percentage for the southbound through movement at Walbert Avenue and Ridgeview Drive is 0%. There is a line item of 3.3% for bicycles on the road, which does not correspond to heavy vehicles. The other PM peak hour heavy vehicles were verified with the count sheets and no discrepancies were noted.

- l. The orientation of the Crackersport Road and Bulldog Drive intersection should be discussed in the Study. The traffic counts include northbound, southbound, and westbound approaches while the capacity analyses include eastbound, westbound, and northbound approaches. Furthermore, Figures 6, 7, 14, and 15 depict movements for the westbound left turn movement and the northbound right turn movement while the capacity analyses identify traffic volumes for all movements at the intersection. The figures should be updated to include the appropriate traffic volumes;**

The intersection required unique layout for synchro to accurately model the operations. Therefore, TPD modeled the free-flow through traffic between Bulldog Drive and Crackersport Road as the major approaches (east-west) and the stop-controlled Bulldog Drive/Site Driveway approach was considered the minor approach (northbound). The figures have been updated accordingly.

- m. The Level of Service Delay Summaries included in the Study should be updated to include the delays for all movements and overall intersection LOS; and**

As requested, the Level of Service summary tables have been updated to include the average delay for all movements and the overall intersection LOS.

- n. We note that the trip generation methodology utilized for the various retail portions of the development (plan identified as Dog Grooming, Restaurant, Professional Services, Retail, and Medical Office Building) assumed ITE Shopping Center, which has a significant pass-by component. As the pass-by volumes are being handled as diverted link trips (see above comment) and given the uncertainty of the actual tenants that will occupy these spaces, the trip generation methodology, when combined with the trip distribution and assignment for the pass-by trips, appears reasonable.**

TPD revised the trip generation calculations to assume a lower pass-by reduction as discussed in item 1.h above.

Should you have any questions or require additional information, please do not hesitate to contact me.

Respectfully Submitted,



Robert Hoffman, P.E., PTOE

Regional Manager

Shetler, Jason

From: Anthony F. Tallarida <atallarida@pidcockcompany.com>
Sent: Tuesday, January 12, 2021 11:46 AM
To: Guthrie, Ben; Hoffman, Rob
Cc: Brian E. Harman
Subject: [EXTERNAL];RE: Bizati Traffic Comments
Attachments: Revised Trip Assignment Figures.pdf

Ben and Rob,

The trip generation has been revised to reduce the amount of pass-by traffic from the ITE rates such that the total pass-by volume is no more than 20 percent of the traffic along Crackersport Road, consistent with PENNDOT practices. Additionally, the distribution for the retail and day care facilities was revised to direct more traffic to local roadways and away from the regional arterials, reflecting the anticipated local draw for these facilities.

As part of the revision, all pass-by traffic was assigned at the proposed site access opposite Winchester Road. It appears that pass-by traffic to/from the west and Bulldog Drive would likely use the western site access opposite Bulldog Drive, rather than the eastern driveway.

We continue to note that the trip generation table identifies 33 Low-Rise Multifamily Housing units, while the most recent plan submission continues to show 35 units. The remaining comments on the TIS in our December 14, 2020 Memorandum should be addressed as applicable.

If you have any questions, please contact us.

Anthony F. Tallarida, P.E.
 Manager, Municipal Division - Planning

THE PIDCOCK COMPANY

From: Guthrie, Ben
Sent: Thursday, January 7, 2021 11:02 PM
To: Anthony F. Tallarida ; Brian E. Harman
Cc: Hoffman, Rob
Subject: RE: Bizati Traffic Comments

Brian/Tony –

As we discussed before the holidays, we have revised the trips for the retail and daycare. These revisions better reflect the nature of the commercial traffic, which will be largely drawn from the surrounding neighborhoods and not from regional highways.

We previously calculated 78 pass-by trips in the AM peak hour (39 enter/39 exit) and 88 pass-by trips in the PM peak hour (44 enter/44 exit). In the past PennDOT has suggested capping pass-by trips at 20 percent of traffic volumes on the adjacent street. Under existing conditions, there are 112 AM vehicles and 117 PM vehicles at the intersection of Crackersport Road & Winchester Road. Therefore, we reduced the pass-by trips to 22 vehicles in the AM peak hour and 23 vehicles in the PM peak hour. The number of new trips was increased accordingly.

TABLE 7
TRIP GENERATION SUMMARY

Land Use	Size	External Trips			Pass-By Trips			New Trips		
		Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Weekday										
Mid-Rise Multifamily Housing	360 units	1238	619	619	0	0	0	1238	619	619
Low-Rise Multifamily Housing	33 units	208	104	104	0	0	0	208	104	104
Daycare	8,000 SF	382	191	191	0	0	0	382	191	191
Shopping Center	15,540 SF	1696	848	848	0	0	0	1696	848	848
Total		3524	1762	1762	0	0	0	3524	1762	1762
Weekday A.M. Peak Hour										
Mid-Rise Multifamily Housing	360 units	108	30	78	0	0	0	108	30	78
Low-Rise Multifamily Housing	33 units	17	4	13	0	0	0	17	4	13
Daycare	8,000 SF	88	47	41	22	11	11	66	36	30
Shopping Center	15,540 SF	160	99	61	22	11	11	138	88	50
Total		373	180	193	44	22	22	329	158	171
Weekday P.M. Peak Hour										
Mid-Rise Multifamily Housing	360 units	130	91	39	0	0	0	130	91	39
Low-Rise Multifamily Housing	33 units	22	14	8	0	0	0	22	14	8
Daycare	8,000 SF	89	42	47	20	10	10	69	32	37
Shopping Center	15,540 SF	137	66	71	26	13	13	111	53	58
Total		378	213	165	46	23	23	332	190	142

We expect that the proposed retail will be neighborhood-oriented small-scale businesses and will not attract regional traffic. Therefore, we increased the amount of traffic to/from Township streets and reduced the number of trips to/from regional highways to 25 percent.

TABLE 8
TRIP DISTRIBUTION PERCENTAGES

Direction (To/From)	Assignment (To/From)	Distribution Percentage	
		Residential	Retail
East	via Route 22 (using Route 309 Interchange)	10%	5%
	via Route 22 (using Cedar Crest Blvd. Interchange)	10%	5%
	via Winchester Road	0%	10%
	via Walbert Avenue	15%	30%
West	via Route 22 (using S.R. 309 Interchange)	25%	5%
	via Ridgeview Drive	5%	5%
North	via S.R. 309	5%	5%
South	via S. R. 309	20%	5%
	via Springhouse Road	10%	30%

The revised trip assignment figures are attached. Once you have had a chance to review, please let us know if you have any questions or comments about our revisions.

Thanks,
Ben

Benjamin T. Guthrie, P.E.
Project Manager

From: Hoffman, Rob <rhoffman@trafficpd.com>
Sent: Monday, December 21, 2020 11:21 AM
To: 'Anthony F. Tallarida' <atallarida@pidcockcompany.com>; Brian E. Harman <bharman@pidcockcompany.com>
Cc: Guthrie, Ben <bguthrie@trafficpd.com>
Subject: RE: Bizati Traffic Comments

Great. How about 3PM. I'll send an outlook invite with a call in number.

Robert L. Hoffman, P.E., PTOE
Regional Manager

From: Anthony F. Tallarida <atallarida@pidcockcompany.com>
Sent: Monday, December 21, 2020 11:19 AM
To: Hoffman, Rob <rhoffman@trafficpd.com>; Brian E. Harman <bharman@pidcockcompany.com>
Cc: Guthrie, Ben <bguthrie@trafficpd.com>
Subject: RE: Bizati Traffic Comments

Rob, I spoke to Brian and we are available this afternoon or tomorrow afternoon. Thanks,

Anthony F. Tallarida, P.E.
 Manager, Municipal Division - Planning

THE PIDCOCK COMPANY

From: Hoffman, Rob <rhoffman@trafficpd.com>
Sent: Monday, December 21, 2020 11:03 AM
To: Brian E. Harman <bharman@pidcockcompany.com>; Anthony F. Tallarida <atallarida@pidcockcompany.com>
Cc: Guthrie, Ben <bguthrie@trafficpd.com>
Subject: Bizati Traffic Comments

Brian/Tony – Do you guys have a couple of minutes either later this afternoon or at any point tomorrow for a quick call with Ben and I to discuss a couple of the comments related to the Bizati project in South Whitehall. I anticipate about 10-15 minutes should cut it.

Thanks,
 Rob

Robert L. Hoffman, P.E., PTOE
Regional Manager



Traffic Planning and Design, Inc.
 1720 Spillman Drive
 Suite 260
 Bethlehem, PA 18015
 610.625.4242
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Ms. Tracy J. Fehnel
Executive Assistant
South Whitehall Township

Ms. Laura M. Harrier
Zoning Officer
South Whitehall Township

Joseph A. Zator, II, Esq.
South Whitehall Township Solicitor
Zator Law

Jennifer R. Alderfer, Esq.
Assistant South Whitehall Township Solicitor
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Mr. Kevin P. Markell, P.E.
Department Head, Civil Engineering
Barry Isett & Associates, Inc.

Mr. Seth A. Shapiro
Principal
Barton Partners

Mr. Matthew J. Koenig, AIA
Principal
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Mr. Robert L. Hoffman, P.E., PTOE
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Traffic Planning and Design, Inc.

Mr. Tony M. Ganguzza, P.E.
Vice President of Preconstruction Services
Boyle Construction, Inc.

Mr. Nick Bizati
E&B Hotel Partnership, LP

James F. Preston, Esquire
Broughal & DeVito, LLP

(all via e-mail)

REPORT:**South Whitehall Township Ordinances:**

Zoning Ordinance (ZO)

Subdivision and Land Development Ordinance (SALDO)

See attached list for documents reviewed.

Proposal:

23.5± Park View Inn and Conference Center Site at northeast quadrant of the Routes 309 and 22 interchange;

Traditional Neighborhood Development (TND) Commercial Retrofit;

6 Mixed Use Buildings (4 stories) consisting of apartments (3 stories above ground-floor uses – 360 total apartments) and the following commercial uses: one 8,000 square foot (s.f.) daycare with 4,900 s.f. outdoor play area; one 3,500 s.f. medical office; one 2,540 s.f. retail store; one 5,000 s.f. professional services office; one 2,840 s.f. leasing office; one 3,500 s.f. restaurant; and one 1,400 s.f. dog grooming store;

7 Townhouse Buildings (5 units per building);

Driveway/street connections to Bulldog Drive (with a roundabout and Crackersport Road);

1.7± Acres of active open space;

5.9± Acres of open space;

2 Stormwater Retention Basins;

Parking areas (total 915 parking spaces); and

Public Water and Sanitary Sewer.

Waivers Granted: N/A

Recommendation:

We offer the attached comments to assist the Township in its consideration of the Conditional Use application.

mjg/acc

Enclosures

South Whitehall Township
Premier Center Luxury Apartments (Bizati Park View)
Conditional Use Application #2020-601

December 14, 2020

REVIEW COMMENTS

A. Conditional Use/Sketch Plan

1. The following general Sketch Plan comments pertain to the Conditional Use, ZO §350-18(c)(3):
 - a. Check/revise the Illustrative Plan and the Conditional Use Plans so they are consistent (sidewalks, townhouse walkways, etc.);
 - b. Check/revise the Site Plan for consistency between the number of parking spaces shown graphically on the Plan and the number of spaces listed;
 - c. For clarity list the number of proposed stories of each Mixed-Use building on the Plan (consistent with the Project Narrative and the General Manual of Written and Graphic Design Standards (Manual));
 - d. The project is in the Little Lehigh Creek Watershed Act 167 Subarea 176 which is a 30/70 percent release rate district. Stormwater management system plans and design calculations which demonstrate that the proposed development will meet the Act 167 runoff and water quality volume (WQv) requirements for discharge to any contiguous properties for each discharge point should be submitted for review with the Preliminary Plan. Documentation of the adequacy of all downstream drainage paths will be required with the Preliminary Plan submission. There are 2 underground stormwater retention system shown on the Plan. Per SALDO §312-10(b)(13), approximate locations of proposed stormwater BMPs should be shown;
 - e. Crackersport Road is designated on the Township Official Map as a collector road, which requires a 70-foot right-of-way and 40-foot cartway SALDO §312-26 and §312-35. Provide frontage improvements to collector street standards (e.g., pavement widening, concrete monuments, street trees, etc.) – proposed drainage, utility, landscaping, etc., designs should account for design of these road improvements;
 - f. Reviews and approvals will be required from Atlantic Pipeline Corp., PPL, and the Township for any work within their easements shown on the Plan. We note a townhouse building appears to be proposed directly over an existing sanitary sewer easement;
 - g. Sign the Owner/Applicant Statement, SALDO §312-10(b)(4);

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- h. Show any proposed project staging, SALDO §312-10(b)(11);
 - i. Identify significant topographical and physical features such as floodplains, wetlands, water conservation areas, steep slopes, woodlands, or note their absence, SALDO §312-10(b)(12);
 - j. List the proposed limits of public and private facilities for Township consideration, SALDO §312-10(b)(14);
 - k. List proposed road right-of-way intended to be dedicated to the Township, SALDO §312-10(b)(14);
 - l. The Township should determine the extent of bicycle paths and recreation trails required, SALDO §312-35(d);
 - m. Contact the Parkland School District to determine suitable locations for school bus stops within the development and incorporate same into the Preliminary Plans, SALDO §312-10(b)(14);
 - n. Contact the Postmaster to determine whether a central mailbox system will be necessary;
 - o. Add a note to the Plans indicating that lots with frontage on both Crackersport Road and an internal roadway must take access from the internal roadway; and
 - p. Matters pertaining to the design of water distribution and sanitary sewerage systems should be discussed with the Public Works Department.
2. Provide information satisfactory to the Township documenting that the Conditional Use requirements listed in ZO §350-18(b) are met; and
 3. Township Zoning Ordinance compliance and Comprehensive Plan consistency is required for a Conditional Use, ZO §350-18(b)(1)(B), §350-18(b)(1)(D). We have (separately) provided our zoning observations to the Township Zoning Officer. Further, we defer to the Township Staff and the Planning Consultant regarding the review of the Manual.

B. Traffic

1. The following comments relate to the Transportation Impact Study (TIS) and Supplemental Analyses, submitted in support of the Conditional Use, ZO §350-18(b)(1)(H):
 - a. We note the following at the Route 309 and Ridgeview Drive intersection:
 - i. During the AM Peak, the westbound left turn movement exceeds capacity in both the 2025 Base condition (volume to capacity ratio

of 1.16) and the 2025 Projected condition (v/c of 1.37). The LOS degrades from LOS F (133.2 seconds of delay per vehicle) to LOS F (216.9 seconds per vehicle) in the AM Peak and from LOS E to LOS F (101.2 seconds per vehicle) in the PM Peak;

- ii. Also during the AM Peak, the westbound left turn movement queue length is anticipated to increase from 738 feet in the no build condition to 1,100 feet in the build condition. While the volume of westbound left turn movements into Bulldog Drive is low (21 and 18), these vehicles will be using the same left turn lane and are not included in the 1,100-foot queue. Further, a portion of the required 1,100-foot queue results from northbound Bulldog Drive left-turning vehicles. We recommend that a microsimulation of these intersections be prepared (see below Comment No. 2);
 - iii. During the PM Peak hour, the northbound through/right turn movement is shown to degrade from LOS D to LOS F (72.0 seconds per vehicle); and
 - iv. During the AM Peak hour, the overall intersection LOS is anticipated to degrade from LOS D (50.8 seconds per vehicle) to LOS E (66.7 seconds per vehicle).
- b. At the Ridgeview Drive and Bulldog Drive intersection, the northbound left/right movement degrades from LOS C to LOS E during the AM Peak and from LOS C to LOS F (52.4 seconds per vehicle) during the PM Peak. Given the close proximity of this intersection to Route 309 and the capacity analysis limitations which assume free-flow movements, a microsimulation of the intersections should be prepared and compared for the no-build and build conditions to demonstrate the potential mitigation improvements;
 - c. The Recommendations and Conclusions section of the Study discusses an all-way stop control at the Springhouse Road and Crackersport Road intersection. We request that TPD provide a warrant analysis to implement an all-way stop at this intersection as mitigation for the eastbound left turn movement that degrades from LOS E to LOS F (56.1) during the AM Peak;
 - d. We previously requested a new Automatic Traffic Recorder (ATR) count be performed for Springhouse Road as it appears the tubes were damaged or the counter malfunctioned;
 - e. The last paragraph in the COVID-19 adjustments section of the Study notes our acceptance of the methodology to adjust the traffic volumes. It should be noted that while we concurred with the methodology, we commented that additional data was necessary to confirm the magnitude of the count adjustment;

- f. The ITE Trip Generation Data provided in Table 6 lists 33 Low-Rise Multi-Family Housing units while the Plans and Executive Summary show 35 units. The Plans and Study should be revised as necessary to be consistent;
- g. The percentages provided for the Trip Distribution Assumptions for Jobs Located in Each Municipality for South Whitehall Township in the Volume Development Worksheets equals 80 percent (30+5+20+25). The percentages should be revised to total 100 percent;
- h. The following comments pertain to the pass-by trip assignments:
 - i. The pass-by trips only account for traffic along Ridgeview Drive and Springhouse Road. Based on existing volumes and destinations, it appears the majority of pass-by traffic should be assigned to Route 309, with less to Springhouse Road and Ridgeview Drive;
 - ii. The new trips along Springhouse Road are split between Winchester Road and Crackersport Road while the pass-by trips are all assigned to Crackersport Road. Further justification should be provided for the inconsistent trip assignments; and
 - iii. The number of pass-by trips shown on Figure 12 includes 44 trips entering and exiting the site while 40 trips are assigned to the roadway network entering and existing the site. Further, the number of pass-by trips during the AM Peak should only be 39 entering and 39 exiting trips.
- i. The new trips entering and exiting the site should be revised as necessary to be consistent with the trip generation (e.g., AM entering trip generation is 141, trip assignment is 125). Additionally, rounding between intersections should be reviewed and revised as necessary;
- j. Based on the Trip Distribution Percentages provided in Table 8 for the Retail, 30 percent of traffic should be entering to and exiting from the east on Walbert Avenue. The trip assignments should be reviewed and revised, as necessary. Additionally, the assignments for the Walbert Avenue east trips appear different for the residential and retail distributions. Justification should be provided for the difference in the distributions;
- k. The following comments pertain to the capacity analyses:
 - i. The peak hour factor identified in the 2017 existing traffic counts during the PM Peak for the Walbert Avenue and Ridgeview Drive intersection is 0.95 while the capacity analyses used 0.98. The peak hour factor should be revised to be consistent with the traffic counts; and

- ii. We note during the PM Peak hour, the heavy vehicle percentage for the southbound through movement at the Walbert Avenue and Ridgeview Drive intersection based on the traffic counts should be 3 percent while the capacity analyses used 0 percent. The percentages at the Ridgeview Drive and Bulldog Drive intersection also appear to be incorrect in the analyses during the PM Peak.
1. The orientation of the Crackersport Road and Bulldog Drive intersection should be discussed in the Study. The traffic counts include northbound, southbound, and westbound approaches while the capacity analyses include eastbound, westbound, and northbound approaches. Furthermore, Figures 6, 7, 14, and 15 depict movements for the westbound left turn movement and the northbound right turn movement while the capacity analyses identify traffic volumes for all movements at the intersection. The figures should be updated to include the appropriate traffic volumes;
 - m. The Level of Service Delay Summaries included in the Study should be updated to include the delays for all movements and overall intersection LOS; and
 - n. We note that the trip generation methodology utilized for the various retail portions of the development (plan identified as Dog Grooming, Restaurant, Professional Services, Retail, and Medical Office Building) assumed ITE Shopping Center, which has a significant pass-by component. As the pass-by volumes are being handled as diverted link trips (see above comment) and given the uncertainty of the actual tenants that will occupy these spaces, the trip generation methodology, when combined with the trip distribution and assignment for the pass-by trips, appears reasonable.
 2. The following comments relate to the Conditional Use Plans:
 - a. The traffic circulation to and from the daycare should be reviewed. Given the one-way roadways, access to the drop-off area on the north side of the building may be difficult;
 - b. The one-way traffic circulation adjacent to the townhomes and adjacent parking areas, including access to the handicapped parking spaces, should be reviewed, notably in the northeast corner of the development;
 - c. The proposed roundabout at the Bulldog Drive entrance should be designed to PENNDOT and national design standards, including splitter islands, signing, and marking. The location of the proposed LANTA bus stop within the circulating roadway should be reconsidered;
 - d. Circulation for anticipated larger vehicles (fire trucks, trash trucks, delivery trucks for the retail businesses, and moving trucks for the residential units) should be demonstrated;

- e. The proximity and availability of handicapped parking for each non-residential use should be provided (e.g., Dog Grooming, Professional Service, Retail, and Dog Park); and
- f. Sidewalk connections, as shown on the rendering, for each of the townhomes fronting on Crackersport Road, should be considered.

The comments noted above are the result of our engineering review. We have not reviewed items associated with legal, geotechnical, lighting, water/sanitary sewerage systems, environmental, building code, public safety, and other non-engineering issues, which should be reviewed by the appropriate Township Staff and Consultants.

South Whitehall Township
Premier Center Luxury Apartments (Bizati Park View)
Conditional Use Application #2020-601

List of Plans and Supplemental Information
Prepared by Barry Isett & Associates, Inc.
and dated November 19, 2020, except as noted

1. Title Sheet, Sheet 1 of 5;
2. Existing Features Plan, Sheet 2 of 5 (cursory review only);
3. Conditional Use – Site Plan, Sheet 3 of 5;
4. Conditional Use – Conceptual Grading Plan, Sheet 4 of 5;
5. Illustrative Plan, Sheet 5 of 5, prepared by Barton Partners and dated November 17, 2020;
6. Traffic Impact Study (TIS) prepared by Traffic Planning and Design, Inc. (TPD);
7. TIS response letter from TPD;
8. General Manual of Written and Graphic Design Standards prepared by E&B Hotel Partnership, LP;
9. Project Narrative; and
10. Letter of Transmittal prepared by Boyle Construction Management.

In addition, we have received the following information in support of the Application:

1. Conditional Use Application, dated September 17, 2020; and
2. Letter of Transmittal, prepared by SWT and dated November 20, 2020.



TRAFFIC PLANNING AND DESIGN, INC.

WWW.TRAFFICPD.COM

March 12, 2020

Mr. Anthony Tallarida, P.E.
The Pidcock Company
2451 Parkwood Drive
Allentown, PA 18103

RE: Transportation Impact Study (TIS) Scoping Application

Bizati Enterprises Parkview Inn Site
South Whitehall Township, Lehigh County
TPD No. BOYC 00003

Dear Mr. Tallarida:

On behalf of Bizati Enterprises, Traffic Planning and Design, Inc. (TPD) has prepared the following TIS Scoping Meeting Application for the above referenced project.

1. *LOCATION OF PROPOSED DEVELOPMENT:*

Municipality: South Whitehall Township County: Lehigh

The proposed site plan is attached. Please refer to **Figure 1** which shows the project location.

2. *DESCRIPTION OF PROPOSED DEVELOPMENT:*

- “ Proposed Site Access: The site will be served by one driveway to Crackersport Road located opposite Winchester Road and one driveway to Bulldog Drive.
- “ Proposed Land Use: The proposed mixed-use development will consist of the following land uses:
 - “ Six (6) mixed-use buildings consisting of 360 apartments over 15,540 square feet (SF) of commercial space;
 - “ 33 townhomes;
 - “ 8,000 SF daycare facility.

3. *ANTICIPATED BUILDOUT DATE:* 2025

4. *TRIP GENERATION:*

Trip generation for the proposed development will be based on:

- ITE Trip Generation Manual.
- Other independent surveys.

TABLE 1
ITE TRIP GENERATION DATA

Land Use	ITE #	Time Period	Ind. Variable	Equations/Rates	Entering %	Pass-By %
Mid-Rise Residential with 1 st Floor Commercial	231	Weekday	360 Dwelling Units	$T = 3.44*(X)$	50%	0%
		Weekday A.M. Peak Hour		$T = 0.30*(X)$	28%	0%
		Weekday P.M. Peak Hour		$T = 0.36*(X)$	70%	0%
Multifamily Housing (Low Rise)	220	Weekday	33 Dwelling Units	$T = 7.56*(X) - 40.86$	50%	0%
		Weekday A.M. Peak Hour		$\ln(T) = 0.95 \ln(X) - 0.51$	23%	0%
		Weekday P.M. Peak Hour		$\ln(T) = 0.89 \ln(X) - 0.02$	63%	0%
Day Care Center	565	Weekday	8 KSF Gross Floor Area	$T = 47.62*(X)$	50%	0%
		Weekday A.M. Peak Hour		$T = 11.00*(X)$	53%	44%
		Weekday P.M. Peak Hour		$T = 11.12*(X)$	47%	44%

T = number of site-generated vehicular trips

X = independent variable

The pass-by rates for the proposed daycare center are based on an article titled "Trip Generation of Day Care Centers," prepared by Pennoni Associates, Inc. and included in the ITE 1990 Compendium of Technical Papers. The study found that daycare facilities have a pass-by rate of 44% during the weekday PM peak hour. Since these pass-by trips were described as work-to-home trips by the parents, TPD assumed that during the AM peak hour the pass-by rate would also be 44%, consisting of home-to-work trips.

TABLE 2
ITE TRIP GENERATION DATA

Land Use	Total Trips			Pass-By Trips			New Trips		
	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Weekday									
Multifamily Housing with 1 st Floor Commercial	1238	619	619	0	0	0	1238	619	619
Townhomes	208	104	104	0	0	0	208	104	104
Daycare	382	191	191	0	0	0	382	191	191
Total	1828	914	914	0	0	0	1828	914	914
Weekday AM. Peak Hour									
Multifamily Housing with 1 st Floor Commercial	108	30	78	0	0	0	108	30	78
Townhomes	17	4	13	0	0	0	17	4	13
Daycare	88	47	41	40	20	20	48	27	21
Total	213	81	132	40	20	20	173	61	112
Weekday P.M. Peak Hour									
Multifamily Housing with 1 st Floor Commercial	130	91	39	0	0	0	130	91	39
Townhomes	22	14	8	0	0	0	22	14	8
Daycare	89	42	47	40	20	20	49	22	27
Total	241	147	94	40	20	20	201	127	74

5. TIS STUDY AREA INTERSECTIONS:

- Route 309 & Ridgeview Drive;
- Ridgeview Drive & Bulldog Drive;
- Crackersport Road & Bulldog Drive;
- Crackersport Road & Winchester Road;
- Crackersport Road & Springhouse Road.

6. STUDY AREA TYPE:

Urban

Rural

7. *TIS ANALYSIS PERIOD AND TIMES:*

- Weekday A.M. peak hour (peak hour within the 7:00-9:00 A.M. peak period);
- Weekday P.M. peak hour (peak hour within the 4:00-6:00 P.M. peak period).

Study Years to be evaluated:

- Existing Conditions;
- 2025 Build Out Year.

8. *TRAFFIC ADJUSTMENT FACTORS:*

- Seasonal Adjustment: (Identify counts requiring adjustment and methodology): None
- Annual Base Traffic Growth: 0.43%/year based on PennDOT Bureau of Planning and Research (BPR) data pertaining to urban non-interstate roadways in Lehigh County.
- Pass-By Trips: See Tables 1 and 2
- Captured Trips for Multi-Use Sites: To be conservative, TPD assumed no internal capture.
- Modal Split Reductions: None
- Other Reduction: None

9. *OTHER PROJECTS WITHIN STUDY AREA TO BE ADDED TO BASE TRAFFIC:*

- Ridge Farm Development at the intersection of Cedar Crest Boulevard and Walbert Avenue;
- Regency at South Whitehall at the intersection of Walbert Avenue and Hampton Road.

10. *TRIP DISTRIBUTION AND ASSIGNMENT:*

TPD recommends distributing and assigning trips to the surrounding roadways based upon an evaluation of the following: (1) existing traffic patterns, (2) roadways surrounding the site, and (3) the proposed site driveway location and configuration.

11. *DATA COLLECTION METHODOLOGIES:*

TPD will conduct intersection turning movement counts at the intersections identified in item #5 above. The counts will be conducted during the peak periods identified in item #7.

12. *CAPACITY/LOS ANALYSIS:*

Capacity analyses to be conducted at the study area intersections for the peak hours and study years to be evaluated according to the methodologies contained in the latest version of the Highway Capacity Manual (HCM 6) utilizing Synchro 10 software. In addition, capacity analyses will be conducted at the proposed site driveway intersections under build out year conditions.

13. *ROADWAY IMPROVEMENTS/MODIFICATIONS BY OTHERS TO BE INCLUDED:*

- **SR 309 and Ridgeview Drive;** Improvements as identified in the TIS prepared in conjunction with the Ridge Farm development consisting of restriping the westbound left-turn lane on Ridgeview Drive to provide 530 feet of storage.

14. *OTHER NEEDED ANALYSES:*

- Sight Distance Analysis: Yes, at site driveway locations.
- Signal Warrant Analysis: As needed
- Required Signal Phasing/Timing Modifications: As Needed
- Traffic Signal Corridor/Network Analysis: N/A

- e. Analysis of the Need for Turning Lanes: Yes
- f. Turning Lane Lengths: Utilizing Pub. 46, Chapter 11
- g. Left Turn Signal Phasing Analysis: As Needed
- h. Queuing Analysis: Utilizing HCM 6 95th percentile queues

TRAFFIC PLANNING AND DESIGN, INC.



Robert Hoffman, P.E., PTOE
Regional Manager

Attachments: Figure 1 – Study Area
Site Plan

cc: Gregg Adams, South Whitehall Township
Nick Bizati, Bizati Enterprises
Tony Ganguzza, P.E., Boyle Construction
Jim Preston, Esq., Broughal & DeVito, LLP
Kevin Markell, P.E., Barry Isett & Associates, Inc.

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Mr. Herb Bender
Maintenance Superintendent
Public Works Department
South Whitehall Township

Mr. Mike Elias
MS4 Program Coordinator
South Whitehall Township

Ms. Tracy J. Fehnel
Executive Assistant
South Whitehall Township

Joseph A. Zator, II, Esq.
South Whitehall Township Solicitor
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Jennifer R. Alderfer, Esq.
Assistant South Whitehall Township Solicitor
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Mr. Brian J. Boyer
Assistant District Traffic & Operations Manager
PA Department of Transportation

Mr. Nick Bizati
E&B Hotel Partnership, LP

Mr. Robert L. Hoffman, P.E., PTOE
Regional Manager
Traffic Planning and Design, Inc.

Mr. Tony M. Ganguzza, P.E.
Vice President of Preconstruction Services
Boyle Construction, Inc.

James F. Preston, Esq.
Broughal & DeVito, LLP

(all via e-mail)

Mr. J. Scott Pidcock, P.E.

REPORT:

We reviewed the March 12, 2020, Transportation Impact Study (TIS) Scoping Application prepared by Traffic Planning and Design, Inc. for the Bizati Enterprises Parkview Inn Site.

The project is proposed on the 23.5± acre ParkView Inn and Conference Center site (formerly Days Inn) located in the northeast corner of the Routes 309 and 22 interchange, and south of Crackersport Road. The site is proposed to be developed as a Traditional Neighborhood Development (TND) Commercial Retrofit – which use requires Conditional Use approval, ZO §350-31(e)(2). The plans propose 6 mixed-use buildings (four 72,800 square foot (s.f.) and two 150,000 s.f. buildings), and 7 townhouse buildings (six 5-unit 2-story townhouse buildings and one 3-unit 2-story townhouse building). A total of 393 residential units are proposed (360 apartments, 33 townhouses). The current ParkView Inn and Conference Center site consists of five 1-story motel buildings (282± rooms), a banquet room, a recreation area containing a pool and sand volleyball court, one laundry building, and a 2-1/2-story house.

The mixed-use buildings are proposed to consist of apartments and the following uses:

1. One 8,000 s.f. Day Care Center (with 5,000 s.f. outdoor play area);
2. Four commercial use areas (sizes include 2,540 s.f., 3,500 s.f. (2), and 5,000 s.f.); and
3. One 1,000 s.f. dog wash/dog spa.

Additionally, tenant storage areas, garages, lobbies, service areas, game rooms, pools, and leasing offices are proposed on the first floors of the mixed-use apartment buildings. A central green open space area, two ground level and two roof deck amenity areas, a 38,500 s.f. active open space area, associated parking areas, and a pedestrian trail are also proposed on the site.

Access to the site is proposed via driveway connections to Bulldog Drive and Crackersport Road.

The TIS Scoping Application utilizes ITE Trip Generation Land Use 231 (Mid-Rise Residential with 1st Floor Commercial) to predict the volumes for the mixed-use Apartments and Commercial. Separate trip generations are provided for the Townhomes (ITE 220 – Multifamily Housing (Low Rise)) and the Day Care Center (ITE 565 – Day Care Center). The Scoping Application predicts 1,828 daily trips from the site (914 entering and 914 exiting trips), with 213 trips during the AM Peak (173 new and 40 pass-by) and 241 trips during the PM Peak (201 new and 40 pass-by).

We offer the attached comments to assist in the preparation of a TIS as part of a Conditional Use Submission. We note that related comments were previously provided in our February 20, 2020, memorandum (attached) regarding the previous Sketch Plan for this site.

beh/laf

Enclosures

South Whitehall Township
 Bizati Enterprises
 Major Subdivision #2020-101
 TIS Scoping Review
 April 1, 2020

REVIEW COMMENTS

1. We note that the applied Mid-Rise Residential with 1st Floor Commercial land use (231) is noted by ITE as being found ‘in dense multi-use urban and center city core settings’, and the trip generation calculations in ITE are based on only 1 or 2 data points. Consideration may be given to applying ITE 221 – Multifamily Housing (Mid Rise) for the residential portion of the development, and one or a variety of ITE commercial land uses for the commercial portion of the development (i.e., Shopping Center; Hair Salon; Fast Casual Restaurant; Bread/Donut/Bagel Shop; and Copy, Print, and Express Ship Store, etc.);
2. Please include truck trip calculations for Day Care Centers as noted in the ITE;
3. Documentation of the pass-by for the Day Care Center, and a copy of the referenced 1990 Pennoni Associates Inc. article should be provided. We note that the ITE *Trip Generation Handbook* indicates no pass-by trips, but an average of 54 percent of Diverted Link Trips during the PM Peak. While it is likely that some pass-by trips would occur, either from within the development or from motorists on Crackersport Road or Bulldog Drive, the assumption that 44 percent of all Day Care traffic would be pass-by traffic appears high. If pass-by trips are considered from the entire surrounding roadway network – Route 309, Ridgeview Drive, and Springhouse Road – then an application of 44 percent would be consistent with the ITE Diverted Link values. Application of pass-by trips for the AM Peak appears reasonable given the nature of the facility;
4. The TIS should identify existing site volumes through a 7-day ATR traffic count on the site driveway;
5. The study area should be expanded to include the following intersections:
 - a. Ridgeview Drive and Hausman Road;
 - b. Winchester Road and Springhouse Road;
 - c. Springhouse Road and Trexler Boulevard; and
 - d. Ridgeview Drive and Walbert Avenue.
6. Given the proximity of the Ridgeview Drive intersections with Hausman Road, Route 309, and Bulldog Drive, the existing and projected queuing conditions may negatively affect access to the redeveloped site. Documentation of the existing queues should be part of the existing traffic count data collection. Specific analyses

- of the queueing between the intersections should be provided to determine the impact on operations of the Bulldog Drive intersection;
7. In addition to adding Ridge Farm and Regency at South Whitehall to the base traffic, the following developments should also be included:
 - a. Crackersport Road DC – Warehouse facility located at Crackersport Road and Eck Road;
 - b. 4741 Chapmans Road – Warehouse facility located along Chapmans Road west of Route 309;
 - c. Parkway Manor Phase 4 – located along Crackersport Road west of Hausman Road;
 - d. 1215 Hausman Road – Flex Warehouse facility located on Hausman Road between Crackersport Road and Ridgeview Drive; and
 - e. Hausman Self-Storage – Mini Warehouse facility on Hausman Road between Ridgeview Drive and Church Road.
 8. Given the current state of affairs involving COVID-19, the timing of additional traffic counts, and any adjustments to the counts already obtained, requires further discussion;
 9. The capacity analyses for the Route 309 and Ridgeview Drive intersection existing condition should reflect reduced eastbound approach capacity due to truck blocking. As part of the Crackersport Road DC proposed development, improvements are proposed at the Route 309 and Ridgeview Drive intersection to enhance operational capacity. We will separately forward Highway Occupancy Permit and Traffic Signal Plans associated with these intersection improvements to the traffic engineer. These improvements should be considered as part of the peak hour analyses under the build-out (2025) conditions;
 10. The proposed Trip Distribution and Assignment should be provided to the Township and our office for review prior to completion of the TIS, with the existing traffic patterns and a narrative identifying the justification for the proposed distribution and assignment;
 11. In addition to the roadway network analyses, the TIS should include discussion regarding the internal roadway layout and traffic circulation, including internal intersection traffic control, one-way driveways, Day Care drop-off/pick-up configuration and operations, on-street parking, development speed limits, internal sight distances (e.g., the covered parking connections to the internal driveway network), and signing; and

12. The scope of improvements necessary to mitigate impacts of the proposed development traffic within the study area should be included in the TIS for discussion with the Township.

SOUTH WHITEHALL TOWNSHIP

4444 Walbert Avenue, Allentown, PA 18104-1699
www.southwhitehall.com • (610) 398-0401

MEMORANDUM

TO: Mr. Gregg R. Adams via e-mail
Planner
South Whitehall Township

FROM: Mr. Anthony F. Tallarida, P.E. AFT
Manager, Municipal Division – Planning

SUBJECT: South Whitehall Township
Bizati Enterprises
Major Subdivision #2020-101
Sketch Plan Review

DATE: February 20, 2020

COPIES: Ms. Renee Bickel, SHRM-SCP, SPHR
Township Manager
South Whitehall Township

Mr. Randy Cope
Director of Township Operations
South Whitehall Township

Mr. George G. Kinney, AICP
Director of Community Development
South Whitehall Township

Mr. David Manhardt, AICP
GIS Manager – Long Range Planner
South Whitehall Township

Ms. Laura M. Harrier
Zoning Officer
South Whitehall Township

TOWNSHIP ENGINEER

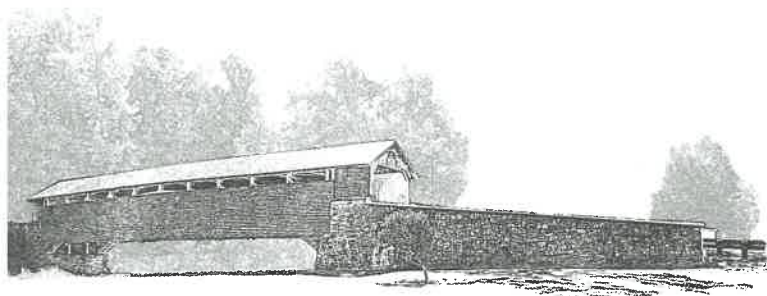
J. Scott Pidcock, P.E., R.A.

The Pidcock Company

2451 Parkwood Drive, Allentown, PA 18103-9608

Phone: (610) 791-2252 • Fax: (610) 791-1256

E-mail: info@pidcockcompany.com



- 2 -

Mr. Gerald Charvala
Assistant Public Works Manager
South Whitehall Township

Mr. Herb Bender
General Services Group Leader
South Whitehall Township

Mr. Mike Elias
MS4 Program Coordinator
South Whitehall Township

Ms. Tracy J. Fehnel
Executive Assistant
South Whitehall Township

Jennifer R. Alderfer, Esq.
Assistant South Whitehall Township Solicitor
Zator Law

(all via e-mail)

E&B Hotel Partnership, LP

Mr. J. Scott Pidcock, P.E.

- 3 -

REPORT:

We reviewed, for general conformance with Sketch Plan requirements contained in the Subdivision and Land Development Ordinance (SALDO) and dimensional requirements of the Zoning Ordinance (ZO), the documents identified on the attached List of Plans and Supplemental Information.

The project is proposed on the 23.5± acre ParkView Inn and Conference Center site (formerly Days Inn) located in the northeast corner of the Routes 309 and 22 interchange, and south of Crackersport Road. The site is proposed to be developed as a Traditional Neighborhood Development (TND) Commercial Retrofit – which use requires Conditional Use approval, ZO §350-31(e)(2). The plans propose 6 mixed-use buildings (four 72,800 square foot (s.f.) and two 150,000 s.f. buildings), and 7 townhouse buildings (six 5-unit 2-story townhouse buildings and one 3-unit 2-story townhouse building). A total of 393 residential units are proposed (360 apartments, 33 townhouses). The current ParkView Inn and Conference Center site consists of five 1-story motel buildings (282± rooms), a banquet room, a recreation area containing a pool and sand volleyball court, one laundry building, and a 2-1/2-story house.

The mixed-use buildings are proposed to consist of apartments and the following uses:

1. One 8,000 s.f. daycare (with 5,000 s.f. outdoor play area);
2. Four commercial use areas (sizes include 2,540 s.f., 3,500 s.f. (2), and 5,000 s.f.); and
3. One 1,000 s.f. dog wash/dog spa.

Additionally, tenant storage areas, garages, lobbies, service areas, game rooms, pools, and leasing offices are proposed on the first floor of the mixed-use apartment buildings. A central green open space area, two ground level and two roof deck amenity areas, a 38,500 s.f. active open space area, associated parking areas, and a pedestrian trail are also proposed on the site.

Access to the site is proposed via connections to Bulldog Drive and Crackersport Road.

Preliminary Zoning Observations have been forwarded separately to the Zoning Officer.

We offer the attached comments to assist in the preparation of Preliminary/Final Plans. The plans should address these comments as well as the requirements of the SALDO, the Zoning Ordinance (ZO), and other applicable regulations.

mjg

Enclosures

South Whitehall Township
Bizati Enterprises
Major Subdivision #2020-101
Sketch Plan Review
February 20, 2020

REVIEW COMMENTS

1. The project is in the Little Lehigh Creek Watershed Act 167 Subarea 176 which is a 30/70 percent release rate district. Stormwater management system plans and design calculations which demonstrate that the proposed development will meet the Act 167 runoff and water quality volume (WQv) requirements for discharge to any contiguous properties for each discharge point should be submitted for review with the Preliminary Plan. Documentation of the adequacy of all downstream drainage paths will be required with the Preliminary Plan submission. There are no stormwater management facilities shown on the Plan. Per SALDO §312-10(b)(13), approximate locations of proposed stormwater BMPs should be shown;
2. Crackersport Road is designated on the Township Official Map as a collector road, which requires a 70-foot right-of-way and 40-foot cartway. Frontage improvements to collector street standards will be required (e.g., curb, sidewalk, concrete monuments, street trees, etc.) – the design of these road improvements should be accounted for in the proposed drainage, utility, landscaping, etc., designs;
3. Reviews and approvals will be required from ARCO, PPL, and SWTA/SWT for any work within their easements shown on the Plan. We note a townhouse building appears to be proposed directly over an existing sanitary sewer easement;
4. For clarity, the HC/R3 and HC/R4 Zoning District boundaries should be shown on the Plan;
5. The following traffic-related items should be addressed with the Preliminary Plan submission:
 - a. A trip generation for the proposed development should be provided;
 - b. Based on the magnitude of the proposed development, a Transportation Impact Study (TIS) will be required to address Conditional Use requirement ZO §350-18(b)(1)(H). A proposed scope of Study should be provided to the Township and our office for review and approval prior to the start of the preparation of the TIS;
 - c. Additional traffic generated by this development will travel Bulldog Drive through the Route 309/Ridgeview Drive intersection, which is a heavily congested intersection with poor Levels of Service. Proposed consideration of the development traffic through this intersection should be discussed;

- 2 -

- d. The proposed driveway connection to Crackersport Road should directly align with Winchester Road, SALDO §312-36(c)(4)(B)(i). Plan limits should be expanded to show adjacent roadway intersections and include street names along Crackersport Road;
 - e. We have not reviewed the internal roadway layout, which is the responsibility of the Developer/Design Engineer. We offer the following observations for consideration:
 - i. It is recommended that the internal roadways at all intersections directly align. This would include the location of building parking garage driveways;
 - ii. We note 2 one-way drives are identified, but there appear to be other roadways of narrow width that may be intended as one-way. Please confirm;
 - iii. Traffic circulation should be reviewed. The route to the daycare drop-off/pick-up area appears circuitous;
 - iv. Sight distances for internal intersections should be reviewed and cleared of obstructions (i.e., buildings and parking areas); and
 - v. Pedestrian circulation and crossing areas should be reviewed. While some crosswalks are shown, there are areas where sidewalks are shown to extend to the street without crosswalks.
 - f. Accessibility for delivery, trash, and fire trucks should be reviewed early in the design process.
6. Required and available sight distances and lines based on PENNDOT stopping sight distance as well as the Township Clear Sight Triangles should be provided for the proposed driveway connections on the Preliminary Plans, SALDO §312-35(a)(6)(F). The required sight distances should be depicted utilizing sight lines and the available sight distances should be labeled on the plans;
 7. A project narrative that describes the proposed scope of site work should be provided, SALDO §312-10(a)(5);
 8. South Whitehall Township should be listed in the title block, SALDO §312-10(b)(3)(F);
 9. A signed Owner's Statement prepared in accordance with SALDO §312-10(b)(4) should be provided;

- 3 -

10. The Site Data should be expanded to include the following:
 - a. The type of water supply and sanitary sewage disposal services proposed (e.g., private, public, etc.), SALDO §312-10(b)(5)(D) and §312-10(b)(5)(E); and
 - b. Parcel Identification Numbers, SALDO §312-10(b)(5)(G).
11. The location map should be revised to be in accordance with SALDO §312-10(b)(6);
12. Contour information should be provided, SALDO §312-10(b)(8);
13. Property boundaries within 200 feet of the site should be provided, SALDO §312-10(b)(10);
14. Any proposed project staging should be shown per SALDO §312-10(b)(11);
15. The Plan should identify significant topographical and physical features such as floodplains, wetlands, water conservation areas, steep slopes, woodlands, or the absence of such features should be noted, SALDO §312-10(b)(12);
16. The proposed limits of public and private facilities (e.g., Homeowners' Association, etc.) should be identified for Township consideration, SALDO §312-10(b)(14). Proposed road right-of-way intended to be dedicated to the Township should be identified on the plans, SALDO §312-10(b)(14);
17. The Township should determine the extent of bicycle paths and recreation trails required, SALDO §312-35(d);
18. The Developer should contact the Parkland School District to determine suitable locations for school bus stops within the development and incorporate same into the Preliminary Plans, SALDO §312-10(b)(14);
19. The Developer should ultimately contact the Postmaster to determine whether a central mailbox system will be necessary;
20. Notes should be added subsequently to Preliminary Plans which indicate that lots which contain both frontage on Crackersport Road and to an internal roadway should take access from the internal roadway;
21. We defer to the Township Planning Consultant regarding the Design Standards and Development Regulations;
22. Site lighting and landscaping plans conforming to applicable Township regulations should be provided for Township review with Preliminary Plans; and

- 4 -

23. Matters pertaining to the design of water distribution and sanitary sewerage systems should be discussed with the Public Works Department.

The comments noted above are the result of our engineering review. We have not reviewed items associated with legal, geotechnical, lighting, water/sanitary sewerage systems, environmental, building code, public safety, and other non-engineering issues, which should be reviewed by the appropriate Township Staff and Consultants.

South Whitehall Township
Bizati Enterprises
Major Subdivision #2020-101
Sketch Plan Review

List of Plans and Supplemental Information
Prepared by Barton Partners and
dated or last revised January 10 (year not listed), except as noted

1. Land Title Survey for Days Inn, prepared by Keystone Consulting Engineers, Inc. last revised September 22, 1997;
2. Sketch Plan, Sheet 1.2; and
3. Sketch Plan – Ground Plan, Sheet 2.2.

From: Brian E. Harman <bharman@pidcockcompany.com>
Sent: Tuesday, October 06, 2020 2:09 PM
To: Hoffman, Rob
Cc: 'Tony Ganguzza'; George Kinney; Anthony F. Tallarida
Subject: RE: Bizati_Parkview Inn

Rob,

Given the current restrictions due to COVID, we continue to recommend a 7-day ATR count on the site driveway to document existing average travel patterns entering and exiting the existing site.

The operation of the Ridgeview Drive / Hausman Road intersection is directly tied to the operation of the Ridgeview Drive / Route 309 intersection. We can support the exclusion of the Ridgeview Drive / Hausman Road intersection from the initial study area with the understanding that if there are changes (physical or timing) at the Route 309 / Ridgeview Drive intersection, inclusion of the Ridgeview Drive / Hausman Road intersection would be required.

We can support the exclusion of the Springhouse Road / Trexler Boulevard intersection from the initial study area with the understanding that if impacts are identified at the Springhouse Road / Crackersport Road or Springhouse Road / Winchester Road intersections, the inclusion of the Springhouse Road / Trexler Boulevard intersection would be required.

If you have any additional questions, please reach out to discuss.

Brian E. Harman, P.E., PTOE
Senior Manager
THE PIDCOCK COMPANY

From: Hoffman, Rob
Sent: Wednesday, September 30, 2020 9:28 AM
To: Anthony F. Tallarida ; Brian E. Harman
Cc: 'Tony Ganguzza'
Subject: RE: Bizati_Parkview Inn

Thanks for the update Tony.

Rob

Robert L. Hoffman, P.E., PTOE
Regional Manager

From: Anthony F. Tallarida <atallarida@pidcockcompany.com>
Sent: Wednesday, September 30, 2020 8:25 AM
To: Hoffman, Rob <rhoffman@trafficpd.com>; Brian E. Harman <bharman@pidcockcompany.com>
Cc: 'Tony Ganguzza' <tganguzza@boyleconstruction.com>
Subject: RE: Bizati_Parkview Inn

Good Morning Rob,

Good to hear the project is rolling again. We have your questions below and are looking into the questions/answers now; I just didn't want to leave you hanging until we have our responses together and back to you. If necessary, as you said below, we can set up a call or virtual meeting to discuss anything further. Thanks,

Anthony F. Tallarida, P.E.
Manager, Municipal Division - Planning

THE PIDCOCK COMPANY

From: Hoffman, Rob <rhoffman@trafficpd.com>
Sent: Tuesday, September 29, 2020 8:58 AM
To: Anthony F. Tallarida <atallarida@pidcockcompany.com>; Brian E. Harman <bharman@pidcockcompany.com>
Cc: 'Tony Ganguzza' <tganguzza@boyleconstruction.com>
Subject: Bizati_Parkview Inn

Good morning Tony T. and Brian. Regarding the Bizati Parkview Inn site in South Whitehall, this project is energizing again. I reviewed your review of our scoping submission and had a few items I wanted to discuss. The following points are from your April 1, 2020 review:

Comment #4 asks for 7 day ATR counts at the site access. We are proposing to do peak period turning movement counts, which will provide the existing site volumes. This would be a typical and acceptable procedure for collecting this data. We do not think it is necessary to conduct 7 day ATR counts.

Comment #5 asks for additional intersections within the study area. We do not think it is necessary to include the intersection of Ridgeview & Hausman. This intersection has been extensively studied with improvements proposed as part of the warehouse project. It is anticipated that a very low percentage of our traffic will be destined to/from the west via Hausman. Likewise, we do not think the intersection of Springhouse & Trexler is necessary. Perhaps we could hold off on that one and add it later if we determine there are impacts to the Springhouse & Crackersport intersection and Springhouse & Winchester intersection. If we do not see impacts at those intersections, I would not anticipate any negative affect at a 'T' intersection, further removed from the site.

Please review and let us know your thoughts. If you think it is beneficial to get on a call to discuss, we are happy to do that.

Thanks,
Rob

Guthrie, Ben

From: Guthrie, Ben
Sent: Tuesday, November 10, 2020 10:51 AM
To: 'Anthony F. Tallarida'; Brian E. Harman
Cc: Hoffman, Rob
Subject: Parkview Inn Site - Traffic Count Adjustments and Trip Distribution
Attachments: Traffic Count Data.pdf; Existing Conditions Volumes After Applying COVID Adjustment.pdf; Trip Distribution Calculations.pdf

Tony and Brian,

We are in the process of completing the traffic study for the redevelopment of the Parkview Inn site. As Rob mentioned, we wanted to give you an opportunity to review two items before we finalize our analysis: (1) traffic adjustment for COVID-19 and (2) trip distribution assumptions.

Adjustment for Impact of COVID-19

TPD conducted new traffic counts at all study area intersections in October 2020 (attached). However, since traffic patterns have been impacted by COVID-19, we compared the 2020 traffic counts to historic traffic counts and applied adjustment factors.

Ridgeview Drive Corridor

TPD compared the traffic counts at the two signalized intersections to the 2017 traffic counts at the same locations. The results are summarized below.

Intersection	Time Period	2017 Volumes	2020 Volumes	Decrease
Route 309 & Ridgeview Drive	AM Peak Hour	2,786	2,092	25%
	PM Peak Hour	2,883	2,366	18%
Walbert Street & Ridgeview Drive	AM Peak Hour	984	594	40%
	PM Peak Hour	1,301	921	29%

To be conservative, TPD will utilize the 2017 traffic counts as the “existing conditions” volumes for this traffic study. TPD will balance the volumes at the intersection of Ridgeview Drive & Bulldog Drive to balance with the intersection of Route 309 & Ridgeview Drive.

Other Study Area Intersections

Since historic traffic counts were not available at the other study area intersections, TPD reviewed 2018 traffic counts from PennDOT’s TIRE database at two locations: [Springhouse Road](#) between Highland Street and Trexler Boulevard and [Winchester Road](#) between Crackersport Road and Valley Drive. TPD then conducted new ATR counts at the same locations. A comparison is summarized below.

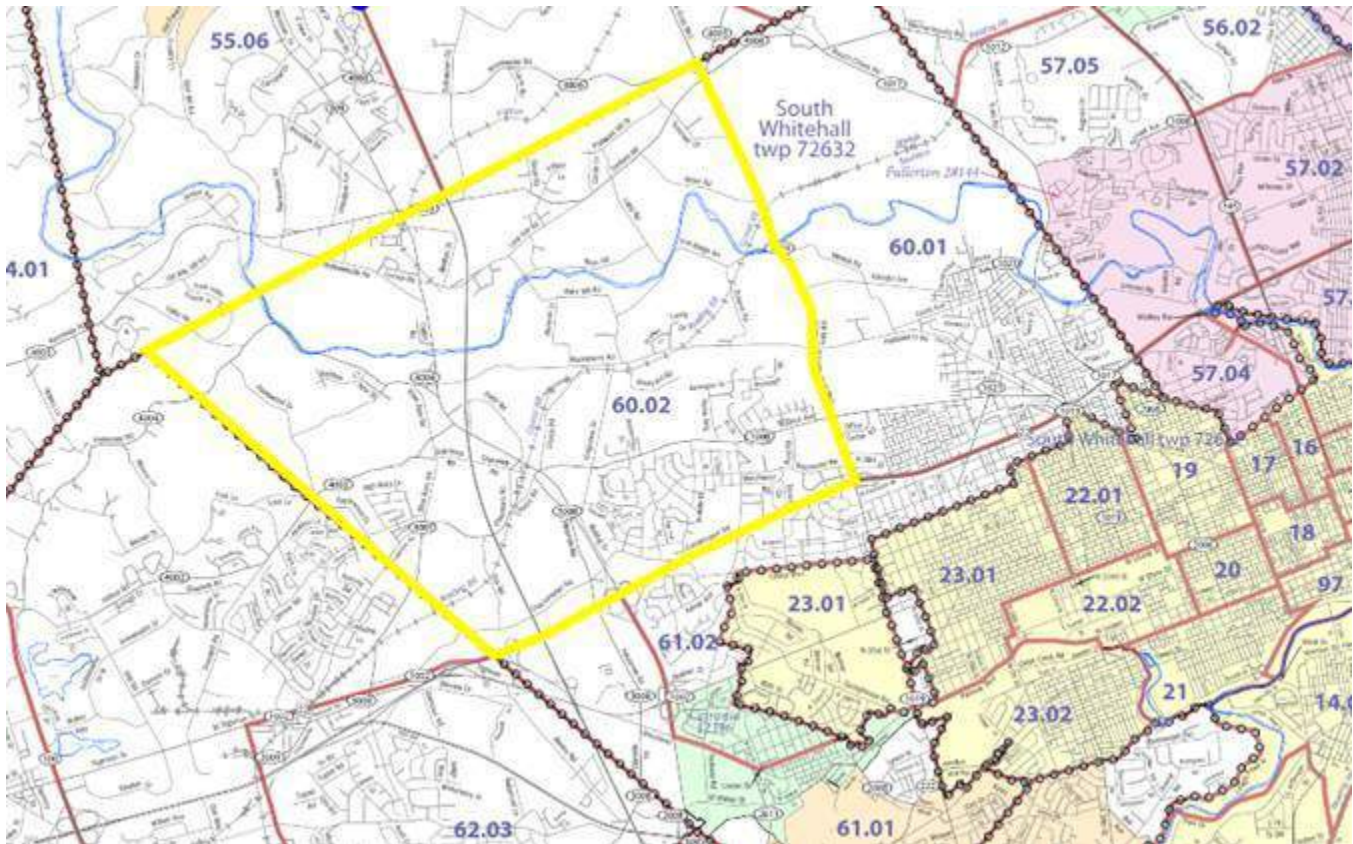
Intersection	Time Period	2018 Volumes	2020 Volumes	Decrease	Adjustment Factor*
Springhouse Road	AM Peak Hour	672	497	26%	1.35
	PM Peak Hour	867	740	15%	1.17
Winchester Road	AM Peak Hour	47	33	30%	1.42
	PM Peak Hour	43	45	--	0.96

*The adjustment factor was calculated by dividing 2018 volumes by 2020 volumes

Based on this data, TPD applied an adjustment factor of 1.35 to all AM peak hour traffic counts and an adjustment factor of 1.17 to all PM peak hour counts. Although the decrease in traffic volumes on Winchester road were slightly different, TPD utilized the data for Springhouse Road due to the larger sample size. This adjustment factor was not applied to the Ridgeview Drive corridor since pre-COVID counts were available.

Trip Distribution

The trip distribution calculations for the development were based on an analysis of US Census Bureau data, as obtained from OnTheMap.com in November 2020. TPD analyzed data regarding the workplace location of all people who live in census tract 60.02, which is highlighted on the map below.



The trip distribution calculations are attached. TPD determined what percentage of people who live in census tract 60.02 work in each of the surrounding municipalities and then assigned the trips based on the most direct travel route(s) to each municipality.

Please let me know if you have any questions or feedback.

Thanks,
Ben

Benjamin T. Guthrie, P.E.

Project Manager

Traffic Planning and Design, Inc.

1720 Spillman Drive
Suite 260



Bethlehem, PA 18015
610.625.4242

www.TrafficPD.com

Connect with us!



Guthrie, Ben

From: Brian E. Harman <bharman@pidcockcompany.com>
Sent: Wednesday, November 11, 2020 4:57 PM
To: Guthrie, Ben; Hoffman, Rob
Cc: George Kinney; Gregg R. Adams; Anthony F. Tallarida
Subject: FW: Parkview Inn Site - Traffic Count Adjustments and Trip Distribution
Attachments: Traffic Count Data.pdf; Existing Conditions Volumes After Applying COVID Adjustment.pdf; Trip Distribution Calculations.pdf

Rob and Ben,

Below are our comments on the traffic count and trip distribution information provided for the Parkview Inn site in South Whitehall Township. Once you have had the opportunity to review the comments, feel free to give me a call to discuss any questions or concerns you may have.

1. Based on a review of the provided traffic volumes, we concur with the use of the 2017 volumes for the Ridgeview Drive corridor for the existing conditions, with additional development volumes added for the no-build condition;
2. Documentation of the PennDOT 2018 volumes for Springhouse Road and Winchester Road should be included in the Report;
3. The three sets of ATR data should be labeled as to their locations. The ATR data provided for Springhouse Road (we believe) begins on Wednesday, October 14th at noon and appears to stop functioning Thursday, October 15th around 11:45 AM. Volumes for the remainder of the ATR deployment do not appear accurate (mostly 0 volume). A full week ATR should be provided to confirm the volume adjustment factor for 2020 compared to the PennDOT volumes in 2018;
4. Based on our telephone discussion, it was noted that the residential portion of the development represented approximately 70 percent of the trip generation and the retail portion represented the remaining 30 percent. Given the type of retail development (small retail and day care), we would anticipate that the trip distribution for the retail development will be from a much smaller service area than the employee service model used to determine the trip distribution. Providing separate distributions for the residential and retail portions of the development should be considered; and
5. We offer the following comments on the Trip Distribution Assumptions:
 - a. Documentation for the existing number of jobs from this area to each of the identified municipalities/counties should be included in the Report;
 - b. There does not appear to be any consideration for South Whitehall Township jobs west of Route 309, either north of Route 22 (Ridgeview Drive, Hausman Road, Crackersport Road) or south of Route 22 (Tilghman Street, Hausman Road, Cetronia Road); and
 - c. Assignment of traffic for Route 22 east should be confirmed to be using the Route 309 interchange.

Brian E. Harman, P.E., PTOE
 Senior Manager
THE PIDCOCK COMPANY

From: Guthrie, Ben <bguthrie@trafficpd.com>
Sent: Tuesday, November 10, 2020 10:51 AM
To: Anthony F. Tallarida <atallarida@pidcockcompany.com>; Brian E. Harman <bharman@pidcockcompany.com>
Cc: Hoffman, Rob <rhoffman@trafficpd.com>
Subject: Parkview Inn Site - Traffic Count Adjustments and Trip Distribution

APPENDIX B:

Study Area Photographs



Direction / Road: NB Route 309
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Route 309
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: SB Route 309
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: SB Route 309
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Ridgeview Drive
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: EB Ridgeview Drive
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: WB Ridgeview Drive
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: WB Ridgeview Drive
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: NB Bulldog Drive
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Bulldog Drive
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: WB Ridgeview Drive
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: WB Ridgeview Drive
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Ridgeview Drive
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Site Driveway
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Site Driveway
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: SB Bulldog Drive
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: SB Bulldog Drive
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Crackersport Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: EB Crackersport Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: Center Driveway - Looking Out
Approach / Departure: _____
Distance: _____



Direction / Road: Center Driveway – Looking In
Approach / Departure: _____
Distance: _____



Direction / Road: Center Driveway – Looking Right
Approach / Departure: _____
Distance: _____



Direction / Road: Center Driveway – Looking Left
Approach / Departure: _____
Distance: _____



Direction / Road: NB Ridgeview Dr.
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Ridgeview Dr.
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: SB Ridgeview Dr.
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: SB Ridgeview Dr.
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Walbert Ave.
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: EB Walbert Ave.
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: WB Walbert Ave.
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: WB Walbert Ave.
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: NB Springhouse Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Springhouse Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: SB Springhouse Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: SB Springhouse Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Crackersport Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: EB Crackersport Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: NB Springhouse Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: NB Springhouse Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: SB Springhouse Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: SB Springhouse Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Winchester Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: EB Winchester Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: WB Winchester Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: WB Winchester Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: SB Winchester Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: SB Winchester Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: EB Crackersport Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: EB Crackersport Road
Approach / Departure: Approach
Distance: 150 Feet



Direction / Road: WB Crackersport Road
Approach / Departure: Approach
Distance: 50 feet



Direction / Road: WB Crackersport Road
Approach / Departure: Approach
Distance: 150 Feet

Job #: BOYC.00003 Date Taken: 01/19/2021 Intersection Of: Crackersport Road (Left Turn Approach)



Direction / Road: Proposed Driveway – Looking Out
Approach / Departure: _____
Distance: _____



Direction / Road: Proposed Driveway – Looking In
Approach / Departure: _____
Distance: _____

Job #: BOYC.00003 Date Taken: 01/19/2021 Intersection Of: Crackersport Road (Left Turn Approach)



Direction / Road:
Approach / Departure:
Distance:

Proposed Driveway – Looking Right



Direction / Road:
Approach / Departure:
Distance:

Proposed Driveway – Looking Left

Job #: BOYC.00003 Date Taken: 01/19/2021 Intersection Of: Crackersport Road (Right Turn Approach)



Direction / Road: _____ Proposed Driveway – Looking Out
Approach / Departure: _____
Distance: _____



Direction / Road: _____ Proposed Driveway – Looking In
Approach / Departure: _____
Distance: _____

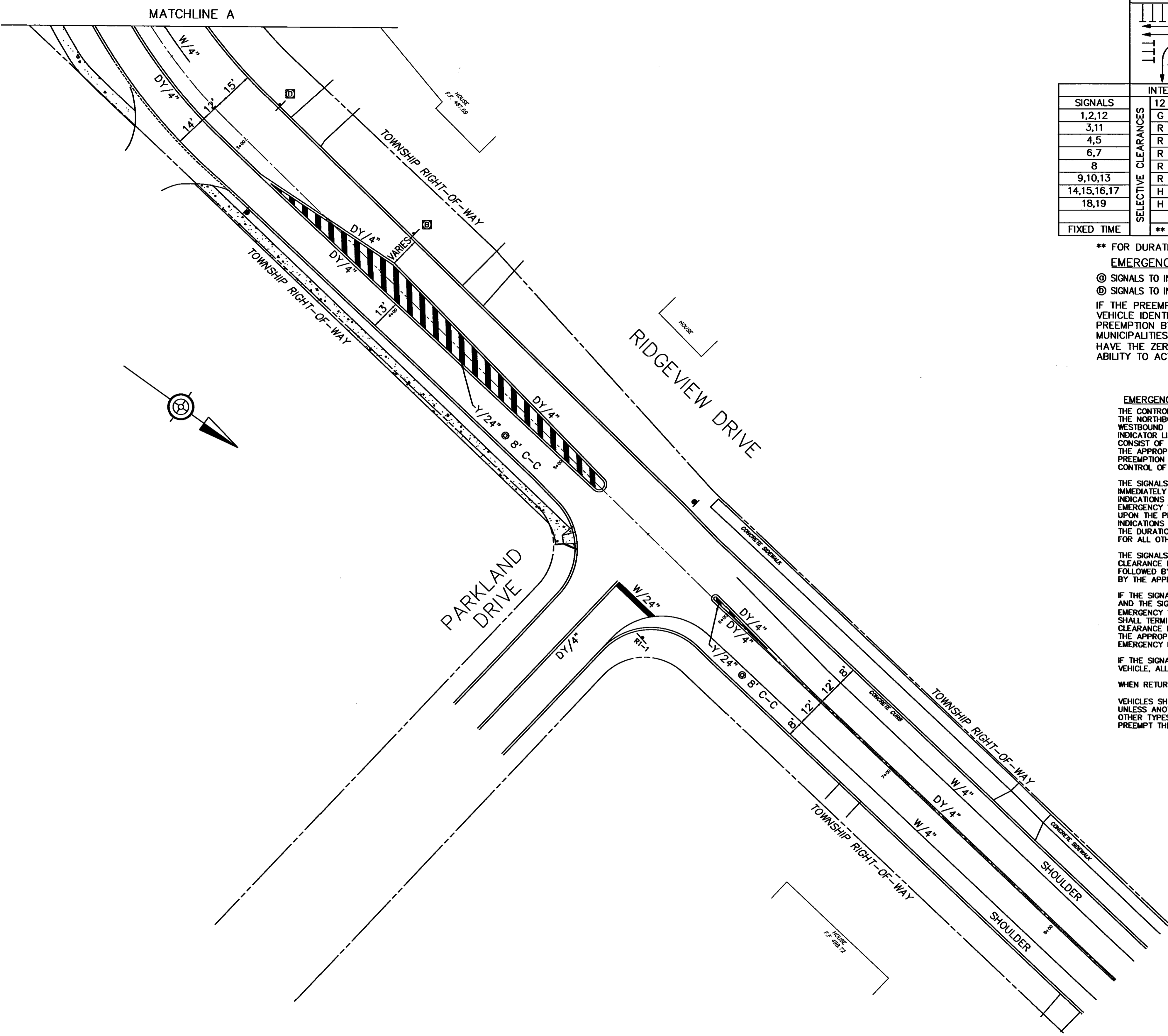
Job #: BOYC.00003 Date Taken: 01/19/2021 Intersection Of: Crackersport Road (Right Turn Approach)



Direction / Road: _____ Proposed Driveway – Looking Left
Approach / Departure: _____
Distance: _____

APPENDIX C:

Traffic Signal Diagrams



EMERGENCY PRE-EMPTION PHASING
MOVEMENT, PHASING AND SEQUENCE CHART

SIGNALS	PHASE 2				PHASE 6			PHASE 4			PHASE 8		
	12	13	14	15	16	17	18	19	20	21	22	23	
1,2,12	G	Y	R	R	R	R	R	R	R	R	R	R	
3,11	R	R	R	G	Y	R	R	R	R	R	R	R	
4,5	R	R	R	R	R	R	G	Y	R	R	R	R	
6,7	R	R	R	R	R	R	R	R	R	R	R	R	
8	R	R	R	R	R	R	G	Y	R	R	R	R	
9,10,13	R	R	R	R	R	R	R	R	R	G	Y	R	
14,15,16,17	H	H	H	H	H	H	H	H	H	H	H	H	
18,19	H	H	H	H	H	H	H	H	H	H	H	H	
FIXED TIME	** 5.5	2		** 5.5	2		** 4.5	2.5		** 4.5	2.5		

** FOR DURATION OF PREEMPTION

EMERGENCY PRE-EMPTION OPERATION NOTES

Ⓞ SIGNALS TO INDICATE G WHEN RETURNING TO NORMAL OPERATION.

Ⓞ SIGNALS TO INDICATE G/Y WHEN RETURNING TO NORMAL OPERATION.

IF THE PREEMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION AND THERE IS THE NEED TO ALLOW PREEMPTION BY EMERGENCY VEHICLES FROM NEARBY MUNICIPALITIES WITH DIFFERENT EMITTERS, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PREEMPTION.

EMERGENCY PRE-EMPTION NOTES

THE CONTROLLER SHALL BE EQUIPPED WITH EMERGENCY PREEMPTION FOR THE NORTHBOUND AND SOUTHBOUND APPROACHES OF SR 309 AND THE WESTBOUND AND EASTBOUND APPROACH OF RIDGEVIEW DRIVE WITH AN INDICATOR LIGHT FOR EACH APPROACH. THE INDICATOR LIGHT SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT AND, IT SHALL FLASH FOR THE APPROPRIATE APPROACH DURING THE GREEN INTERVAL IN THE PREEMPTION PHASE TO CONFIRM THAT THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL IMMEDIATELY TERMINATE ALL GREEN INDICATIONS, EXCEPT THE GREEN INDICATIONS FOR THE PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE, FOLLOWED BY SELECTIVE CLEARANCES DEPENDENT UPON THE PHASE IN WHICH THE PREEMPTION OCCURS. THE GREEN INDICATIONS FOR THE PREEMPTED APPROACH SHALL REMAIN GREEN FOR THE DURATION OF SIGNAL PREEMPTION WITH RED INDICATIONS DISPLAYED FOR ALL OTHER APPROACHES.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, DURING ANY CLEARANCE INTERVAL, SHALL TIME OUT ALL YELLOW AND RED INTERVALS, FOLLOWED BY THE GREEN INTERVAL OF THE PREEMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.

IF THE SIGNALS HAVE BEEN ACTUATED BY A PEDESTRIAN PUSHBUTTON, AND THE SIGNAL IS SUBSEQUENTLY PREEMPTED BY AN APPROACHING EMERGENCY VEHICLE, THE PEDESTRIAN WALK (WALKING PERSON) INTERVAL SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE PEDESTRIAN CLEARANCE INTERVAL. THIS INTERVAL SHALL TIME OUT, FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES BEFORE GOING INTO EMERGENCY PREEMPTION.

IF THE SIGNALS ARE FLASHING WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ALL SIGNALS SHALL REMAIN FLASHING.

WHEN RETURNING TO NORMAL OPERATION, GO TO PHASE 2+6, INTERVAL 4.

VEHICLES SHALL BE SERVED ON A "FIRST COME, FIRST SERVED" BASIS, UNLESS ANOTHER MODE OPERATION IS APPROVED BY PENNDOT. NO OTHER TYPES OR CLASSES OF VEHICLES SHALL BE PERMITTED TO PREEMPT THE TRAFFIC SIGNAL UNLESS APPROVED BY PENNDOT.

- LEGEND
- ④ - Phase Number
 - ▲ - Mast Arm
 - - Strain Pole
 - - Pedestal
 - ➔ - Vehicular Signal Head
 - - Pedestrian Signal Head
 - JB1 - Junction Box
 - ④ - Sign
 - ⊞ - Vehicle Detector
 - ➔ - Pedestrian Push Button
 - ➔ - Pedestrian Push Button/Sign
 - CC4 - Controller Assembly
 - W/4" - Solid White Line/Width
 - BW/4" - Broken White Line/Width
 - Y/4" - Solid Yellow Line/Width
 - BY/4" - Broken Yellow Line/Width
 - DY/4" - Double Solid Yellow Line/Width
 - ☼ - Emergency Preemption Beacon
 - Ⓞ - Emergency Preemption Detector

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
5-0	LEHIGH	0309		3 OF 3
SOUTH WHITEHALL TOWNSHIP				
PERMIT NO. 39-103-004		SHEET 3 OF 3		
DATE ISSUED 4-30-71		DATE REVISED 2-25-19		

County: LEHIGH

Municipality: SOUTH WHITEHALL TOWNSHIP

Intersection: SR 309 & RIDGEVIEW DRIVE (T-600)

Reviewed: *Christina Jovi Morgan* 2/13/19
Municipal Official Date

Reviewed: *Cheryl Long* 2/21/19
District Traffic Signals Div. Date

Recommended: *William Joney* 2/21/19
District Traffic Engineer Date

Scale: 0 25 50 75



TRAFFIC
SIGNAL PERMIT

Permit No. 39-103-043Sheet 1 of 3

148

In accordance with the Vehicle Code, the Secretary of Transportation hereby approves the installation and operation of a traffic signal at the intersection of:

SR 1006 (Walbert Avenue)

and Ridgeview Drive (T-600)

in the Township of South Whitehall, County of Lehigh

This permit is issued to, and accepted by the Township of South Whitehall hereinafter known as the Permittee, as follows:

This installation shall be in accordance with the Vehicle Code and the Regulations for traffic signs, signals and markings of the Department of Transportation, and shall conform to the following requirements and those contained on the attached sheets.

Type of Controller Semi-Actuated

Type of Signal Mounting Post Mounted and Overhead

Hours of Operation as "Stop" and "Go" As indicated on the attached diagram.

Hours of Operation as "Flashing" As indicated on the attached diagram.

Controller Operation Controller to provide the phasing, timing and signal display as indicated on the attached diagram.

Preemption for emergency vehicles (fire apparatus) to provide the operation indicated on the attached diagram.

All work performed by the Permittee in the erection of the traffic signal shall be under and subject to the direction of the Secretary of Transportation or her authorized representatives. The said Permittee shall use due diligence in the execution of the work authorized under this permit and shall not obstruct or endanger travel along the said road. All operations must be conducted so as to permit safe and reasonable free travel at all times over the road within the limits of the work herein permitted.

The Permittee covenants and agrees to fully indemnify and save harmless the Department of Transportation and assume all liability for damages or injury, occurring to any person, persons or property through or in consequence of any act or omission of anyone working on the construction, or from faulty maintenance or operation of such traffic signal.

The Secretary of Transportation, by law, reserves the right to revoke and annul this permit if the Permittee shall at any time willfully or negligently fail to comply with the conditions contained in this permit, or, upon changes in the traffic conditions, fail to make any changes in the construction or operation of this signal, or to remove it, when so ordered by the Secretary of Transportation; or if this installation is not in operation within twenty-four (24) months of the receipt of this permit. The Permittee shall maintain the signal in a safe condition at all times. The Permittee shall not make any change in the construction or operation of this traffic signal without prior written approval of the Secretary of Transportation.

This permit cancels and supersedes all previous permits issued for this location upon completion of the installation specified herein.

INITIAL DATE: November 6, 2009

REVISION DATE: April 16, 2018

APPROVED

Leslie S. Richards

Secretary of Transportation

BY

Jill Krause
District Executive

PHASING, TIMING and COLOR SEQUENCE CHART

SIGNALS	PHASE 2+6				PHASE 4+8			
	1	2	3	4	5	6	7	8
1,2	R	R	R	R	G	G	Y	R
3,4	R	R	R	R	G	G	Y	R
5,6,9	G	G	Y	R	R	R	R	Y
7,8	G	G	Y	R	R	R	R	Y
10,11,12,13	H	H	H	H	M	FH	H	OFF
14,15,16,17	M	FH	H	H	H	H	H	OFF

FIXED	5	2	4	2
MIN. GREEN	10			
ADDED INIT.	1.5		3	
MAX. INITIAL	29			
PASSAGE	5.5		3	
TBR	29			
TTR	14			
MIN. GAP	2.5			
MAXIMUM I	32		15	
MAXIMUM II	25		22	
MAXIMUM III	25		22	
PEDESTRIAN	7	18	7	17
MEMORY	MIN	RECALL	NON-LOCKING	

OPERATION NOTES

① UPON PEDESTRIAN ACTUATION ONLY, OTHERWISE HAND SYMBOL AT ALL TIMES

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
5-0	LEHIGH	1006		2 OF 3
SOUTH WHITEHALL TOWNSHIP				
PERMIT NO. 39-103-043		SHEET 2 OF 3		
DATE ISSUED 11-06-09		DATE REVISED 4-16-18		

GENERAL NOTES

Installation, operation and maintenance of this traffic signal to be in accordance with Pennsylvania Department of Transportation Regulations on Official Traffic Control Devices.

No modifications of this installation are permitted unless prior approval is granted, in writing, by the Department.

All maintenance necessary for proper visibility of the signals, including trimming trees, is the responsibility of the Permittee.

All signs and pavement markings indicated on this drawing are considered part of the permit and are to be installed and maintained by the Permittee, unless otherwise indicated, except the longitudinal pavement markings on State highways which will be maintained by the Department.

Install post mounted signals with the signal heads a minimum of 2 feet behind the face of the curb or edge of the shoulder. Support poles for overhead signals will have a minimum horizontal clearance of 2 feet.

The bottom of signal heads and signs erected over the roadway are not to be less than 15 feet nor more than 19 feet above the roadway. The bottom of post mounted signal heads are to be not less than 8 feet nor more than 15 feet above the sidewalk or pavement grade.

The minimum horizontal distance between signal heads measured at right angles to the approach is to be 8 feet.

In addition to this signal permit, the permittee will obtain a Highway Occupancy Permit prior to any openings being made in or under any portion of a State Highway, if applicable.

This drawing cannot be used as a construction drawing unless the Permittee complies with the provisions of Act 287-1974, amended by Act 160-2016, Prevention of Damage to Underground Utilities. Prior to construction consult with utility companies to resolve any problems which may be created due to the location of utilities.

Place pavement markings in accordance with the Department of Transportation Pavement Marking Standards TC-8600 Series.

Maintenance and protection of traffic for the installation and maintenance of this traffic signal to be in accordance with Publication 213, Work Zone Traffic Control Guidelines.

Threaded plate mast arm connections will not be permitted for this traffic signal permit.

County: LEHIGH
 Municipality: SOUTH WHITEHALL TOWNSHIP
 Intersection: S.R. 1006 (WALBERT AVENUE) & T-600 (RIDGEVIEW DRIVE)

Reviewed: [Signature] 10/19/17
 Municipal Official Date

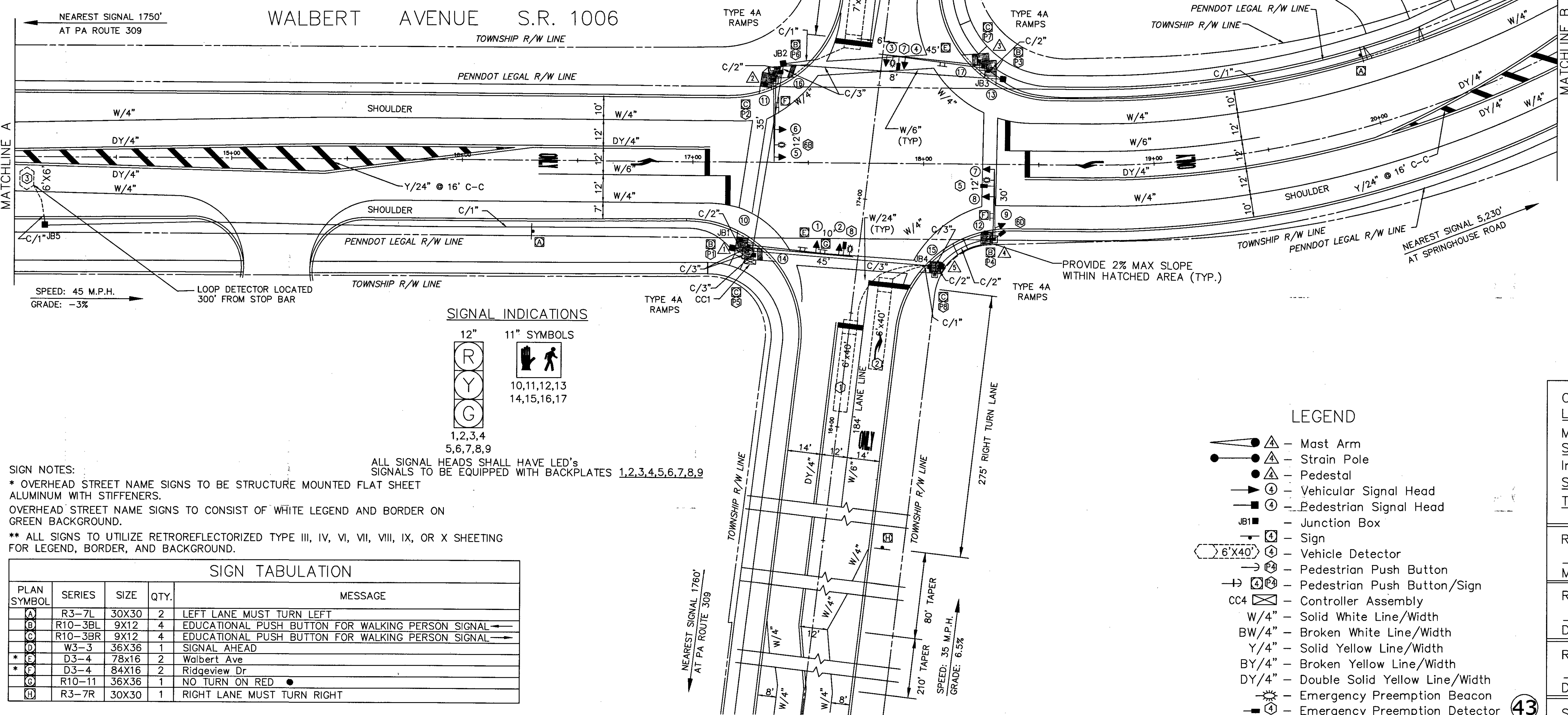
Reviewed: [Signature] 4/16/18
 District Traffic Signals Div. Date

Recommended: [Signature] 4/18/18
 District Traffic Engineer Date

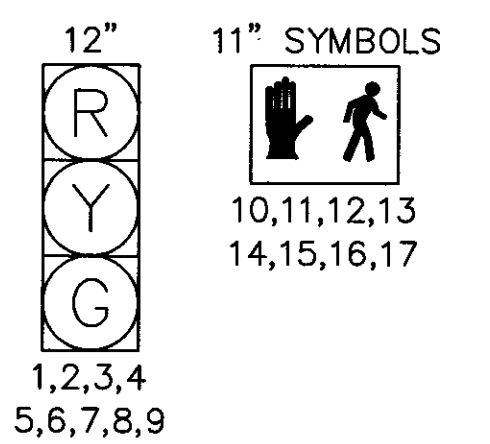
Scale: 0 25 50 75

PROGRAM CHART

EVENT NO.	DAY OF WEEK							TIME			CYCLE	OFFSET (SEC.)	REMARKS
	M	T	W	T	F	S	S	HR	MIN	SEC			
1	X	X	X	X	X	X	X	07	00	00	---	---	AM PEAK, MAX I
2	X	X	X	X	X	X	X	09	30	00	---	---	OFF PEAK, VOL. DENS., MAX II
3	X	X	X	X	X	X	X	14	30	00	---	---	PM PEAK, MAX III
4	X	X	X	X	X	X	X	18	30	00	---	---	OFF PEAK, VOL. DENS., MAX II



SIGNAL INDICATIONS



ALL SIGNAL HEADS SHALL HAVE LED'S SIGNALS TO BE EQUIPPED WITH BACKPLATES 1,2,3,4,5,6,7,8,9

SIGN NOTES:

* OVERHEAD STREET NAME SIGNS TO BE STRUCTURE MOUNTED FLAT SHEET ALUMINUM WITH STIFFENERS.

OVERHEAD STREET NAME SIGNS TO CONSIST OF WHITE LEGEND AND BORDER ON GREEN BACKGROUND.

** ALL SIGNS TO UTILIZE RETROREFLECTORIZED TYPE III, IV, VI, VII, VIII, IX, OR X SHEETING FOR LEGEND, BORDER, AND BACKGROUND.

SIGN TABULATION

PLAN SYMBOL	SERIES	SIZE	QTY.	MESSAGE
(A)	R3-7L	30X30	2	LEFT LANE MUST TURN LEFT
(B)	R10-3BL	9X12	4	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL
(C)	R10-3BR	9X12	4	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL
(D)	W3-3	36X36	1	SIGNAL AHEAD
(E)	D3-4	78x16	2	Walbert Ave
(F)	D3-4	84X16	2	Ridgeview Dr
(G)	R10-11	36X36	1	NO TURN ON RED
(H)	R3-7R	30X30	1	RIGHT LANE MUST TURN RIGHT

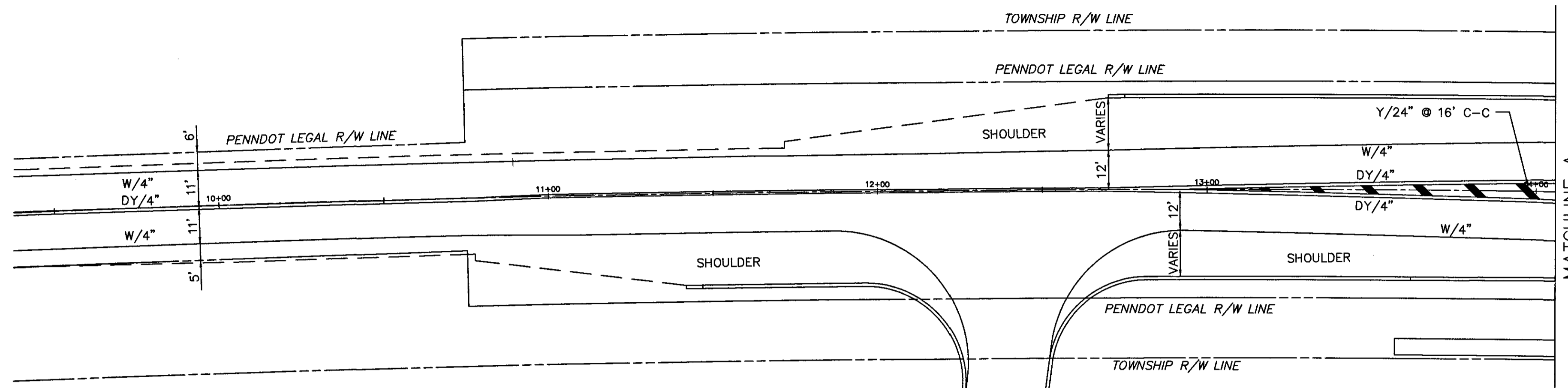
LEGEND

- ▲ - Mast Arm
- - Strain Pole
- - Pedestal
- ④ - Vehicular Signal Head
- ④ - Pedestrian Signal Head
- JB1 - Junction Box
- ④ - Sign
- ④ - Vehicle Detector
- ④ - Pedestrian Push Button
- ④ - Pedestrian Push Button/Sign
- CC4 - Controller Assembly
- W/4" - Solid White Line/Width
- BW/4" - Broken White Line/Width
- Y/4" - Solid Yellow Line/Width
- BY/4" - Broken Yellow Line/Width
- DY/4" - Double Solid Yellow Line/Width
- ☀ - Emergency Preemption Beacon
- ④ - Emergency Preemption Detector



WALBERT AVENUE S.R. 1006

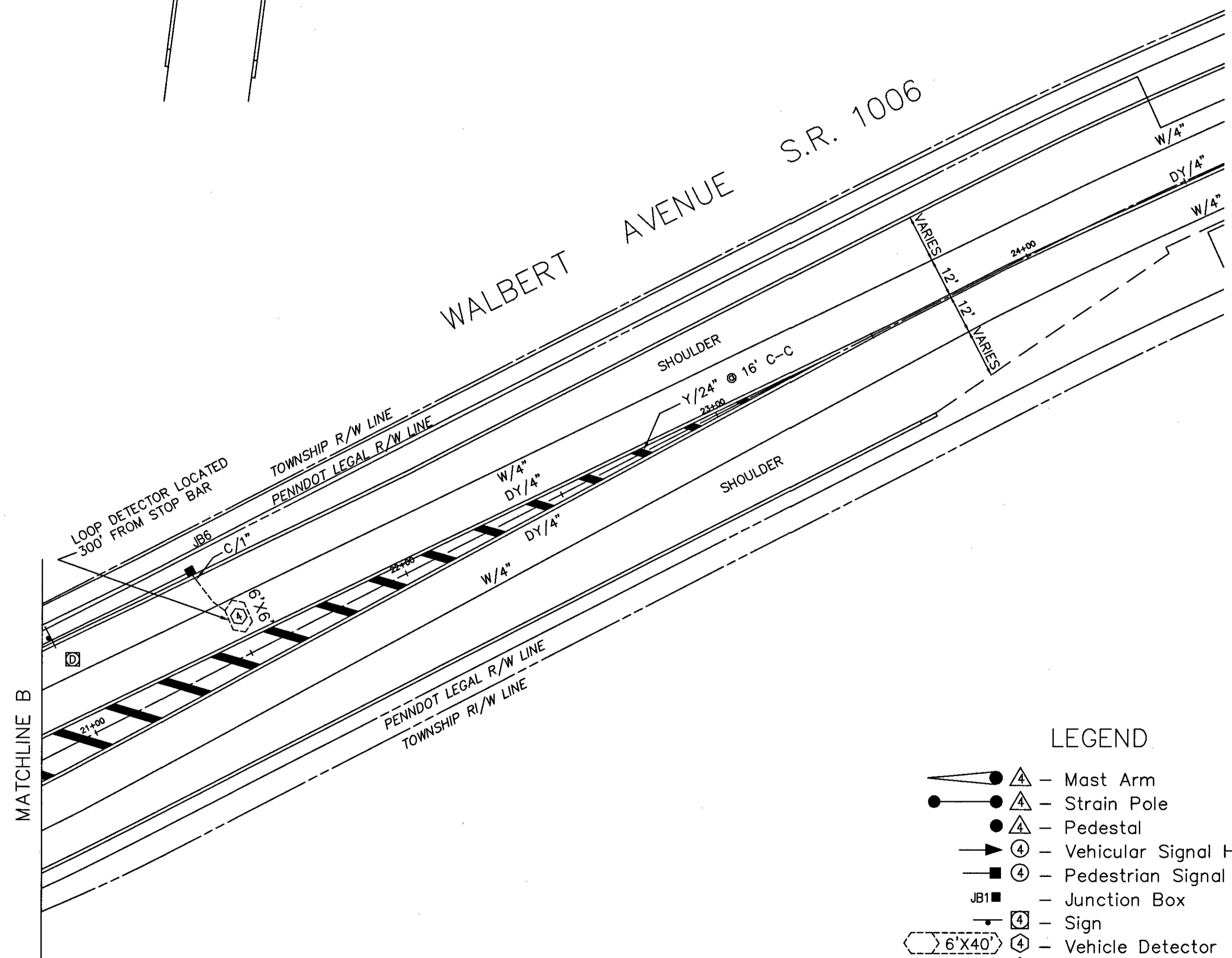
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
5-0	LEHIGH	1006		3 OF 3
SOUTH WHITEHALL TOWNSHIP				
PERMIT NO. 39-103-043		SHEET 3 OF 3		
DATE ISSUED 11-06-09		DATE REVISED 4-16-18		



EMERGENCY PREEMPTION PHASING

SIGNALS	PHASE 2			PHASE 4			PHASE 6			PHASE 8		
	9	10	11	12	13	14	15	16	17	18	19	20
1,2	R	R	R	R	R	R	R	R	R	G	Y	R
3,4	R	R	R	G	Y	R	R	R	R	R	R	R
5,6,9	R	R	R	R	R	R	G	Y	R	R	R	R
7,8	G	Y	R	R	R	R	R	R	R	R	R	R
10,11,12,13	H	H	H	H	H	H	H	H	H	H	H	H
14,15,16,17	H	H	H	H	H	H	H	H	H	H	H	H
FIXED TIME	*	5	2	*	4	2	*	5	2	*	4	2

* FOR DURATION OF PREEMPTION OPERATION NOTES
 © REMAIN G IF FOLLOWED BY NORMAL OPERATION



- LEGEND**
- ▲ - Mast Arm
 - - Strain Pole
 - - Pedestal
 - ④ - Vehicular Signal Head
 - ④ - Pedestrian Signal Head
 - JB1 - Junction Box
 - ④ - Sign
 - ④ - Vehicle Detector
 - ④ - Pedestrian Push Button
 - ④ - Pedestrian Push Button/Sign
 - CC4 - Controller Assembly
 - W/4" - Solid White Line/Width
 - BW/4" - Broken White Line/Width
 - Y/4" - Solid Yellow Line/Width
 - BY/4" - Broken Yellow Line/Width
 - DY/4" - Double Solid Yellow Line/Width
 - ☀ - Emergency Preemption Beacon
 - ④ - Emergency Preemption Detector

EMERGENCY PREEMPTION NOTES:

THE CONTROLLER SHALL BE EQUIPPED WITH EMERGENCY PREEMPTION FOR THE EASTBOUND AND WESTBOUND APPROACHES OF S.R.1006 (WALBERT AVENUE) AND THE NORTHBOUND AND SOUTHBOUND APPROACHES OF T-600 (RIDGEVIEW DRIVE) WITH AN INDICATOR LIGHT FOR EACH APPROACH. THE INDICATOR LIGHT SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT AND, IT SHALL FLASH FOR THE APPROPRIATE APPROACH DURING THE GREEN INTERVAL IN THE PREEMPTION PHASE TO CONFIRM THAT THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION.

THE SIGNALS, WHEN ACTIVATED DURING ANY CLEARANCE INTERVAL BY AN EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS, EXCEPT THE GREEN INDICATIONS FOR THE PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE, FOLLOWED BY SELECTIVE CLEARANCES DEPENDENT UPON THE PHASE IN WHICH THE PREEMPTION OCCURS. THE GREEN INDICATIONS FOR THE PREEMPTED PHASE SHALL REMAIN GREEN FOR THE DURATION OF SIGNAL PREEMPTION AND RED INDICATIONS DISPLAYED FOR ALL OTHER PHASES.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PREEMPTION PHASE GOVERNED BY THE ACTUATION OF THE APPROACHING EMERGENCY VEHICLE.

IF THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ARE FLASHING ALL SIGNALS SHALL REMAIN FLASHING.

UPON COMPLETION OF PREEMPTION PHASE 2 OR 6, IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 1 SHALL FOLLOW.

UPON COMPLETION OF PREEMPTION PHASE 4 OR 8, IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 1 SHALL FOLLOW.

IF THE PREEMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION AND THERE IS THE NEED TO ALLOW PREEMPTION BY EMERGENCY VEHICLES FROM NEARBY MUNICIPALITIES WITH DIFFERENT EMITTERS, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVE THE EMERGENCY PREEMPTION.

IF THE SIGNALS HAVE BEEN ACTUATED BY A PEDESTRIAN PUSHBUTTON, AND THE SIGNAL IS SUBSEQUENTLY PREEMPTED BY AN APPROACHING EMERGENCY VEHICLE, THE PEDESTRIAN WALK (WALKING PERSON) INTERVAL SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE PEDESTRIAN CLEARANCE INTERVAL. THIS INTERVAL SHALL TIME OUT, FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES BEFORE GOING INTO EMERGENCY PREEMPTION.

County: LEHIGH
 Municipality: SOUTH WHITEHALL TOWNSHIP
 Intersection: S.R. 1006 (WALBERT AVENUE) & T-600 (RIDGEVIEW DRIVE)

Reviewed: *[Signature]* 10/16/17
 Municipal Official Date

Reviewed: *[Signature]* 4/16/18
 District Traffic Signals Div. Date

Recommended: *[Signature]* 4/11/18
 District Traffic Engineer Date

Scale: 0 25 50 75



PHASING, TIMING and COLOR SEQUENCE CHART

SIGNALS	PHASE 1+6			PHASE 2+6			PHASE 4+8			EMERGENCY FLASHING OPERATION	
	1	2	3	4	5	6	7	8	9		10
1,2,12	R	R	R	G	G	Y	R	R	R	R	Y
3,11	G	Y	R	G	G	Y	R	R	R	R	Y
4,5	G	Y	R	G	G	Y	R	R	R	R	Y
6,7	R	R	R	R	R	R	R	G	G	Y	R
8	R	R	R	R	R	R	R	G	G	Y	R
9,10,13	R	R	R	R	R	R	R	G	G	Y	R
14,15,16,17	H	H	H	M	FH	H	H	H	H	H	OFF
18,19	H	H	H	H	H	H	H	M	FH	H	OFF

FIXED	5	5	4		5	4		5	4	4
MIN. GREEN	5	5	4		15	5	4	5	4	4
PASSAGE	3							8		
MAXIMUM I	16				26			22		
MAXIMUM II	15				24			25		
MAXIMUM III	5				31			16		
PEDESTRIAN					7	23		7	27	
MEMORY	NON-LOCKING				MAX RECALL			NON-LOCKING		

OPERATION NOTES

- G/Y IF FOLLOWED BY PHASE 2+6
- G IF FOLLOWED BY PHASE 2+6
- UPON PEDESTRIAN ACTUATION ONLY, OTHERWISE HAND SYMBOL AT ALL TIMES
- PHASE 1+6 TO FOLLOW PHASE 4+8 ONLY
- Y/G IF FOLLOWED BY PHASE 1+6
- R/G IF FOLLOWED BY PHASE 1+6

PROGRAM CHART

EVENT NO.	DAY OF WEEK							TIME	CYCLE	OFFSET (SEC.)*	REMARKS
	M	T	W	T	F	S	S				
1	X	X	X	X	X	X		06 30 00	90	0	MAX I
2	X	X	X	X	X	X		08 30 00	---	FREE	MAX III
3	X	X	X	X	X	X		15 00 00	90	0	MAX II
4	X	X	X	X	X	X		18 00 00	---	FREE	MAX III

* OFFSET IS REFERENCED TO BEGINNING OF INTERVAL NO.2 IN SECONDS

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
5-0	LEHIGH	0309		2 OF 3

SOUTH WHITEHALL TOWNSHIP

PERMIT NO. 39-103-004	SHEET 2 OF 3
DATE ISSUED 4-30-71	DATE REVISED

GENERAL NOTES

Installation, operation and maintenance of this traffic signal to be in accordance with Pennsylvania Department of Transportation Regulations on Official Traffic Control Devices.

No modifications of this installation are permitted unless prior approval is granted, in writing, by the department.

All maintenance necessary for proper visibility of the signals, including trimming trees, is the responsibility of the Permittee.

All signs and pavement markings indicated on this drawing are considered part of the permit and are to be installed and maintained by the Permittee, unless otherwise indicated, except the longitudinal pavement markings on State highways which will be maintained by the department.

Install Traffic Signal Supports in Accordance with Publication 149, Chapter 5.

The bottom of signal heads and signs erected over the roadway are not to be less than 15 feet nor more than 19 feet above the roadway. The bottom of post mounted signal heads are to be not less than 8 feet nor more than 15 feet above the sidewalk or pavement grade.

The minimum horizontal distance between signal heads measured at right angles to the approach is to be 8 feet.

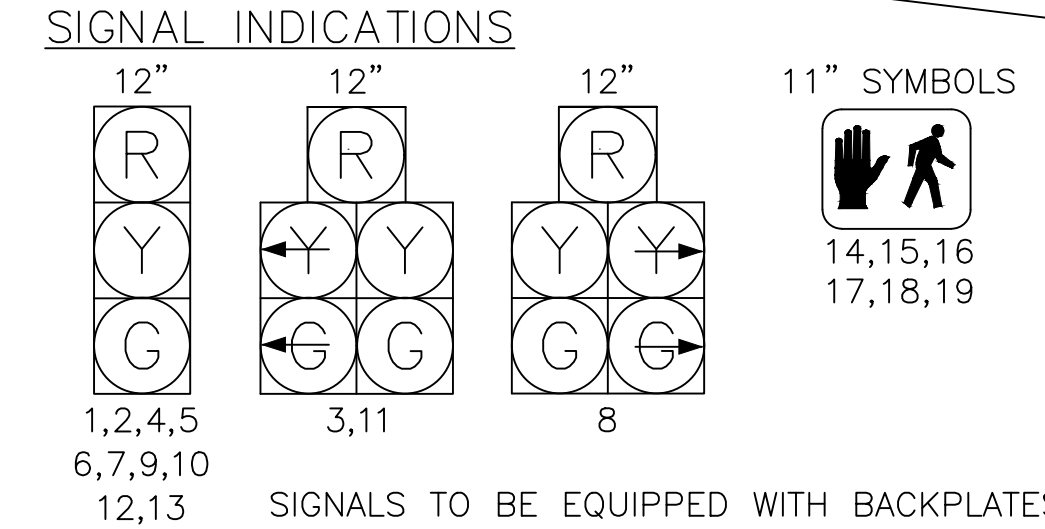
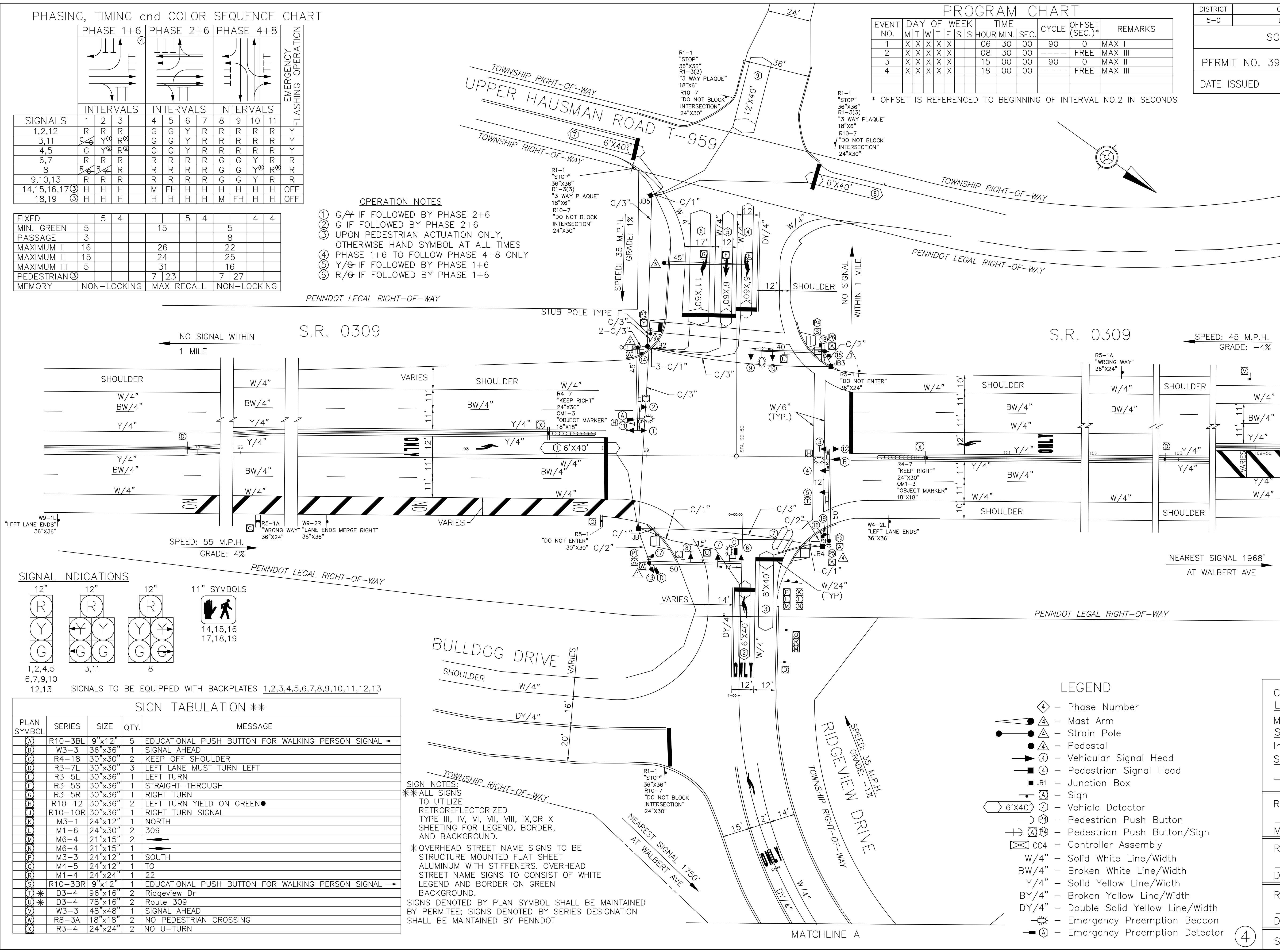
In addition to this signal permit, the Permittee will obtain a Highway Occupancy Permit prior to any openings being made in or under any portion of a State Highway, if applicable.

This drawing cannot be used as a construction drawing unless the Permittee complies with the provisions of Act 287-1974 amended by Act 50-2017, Prevention of Damage to Underground Utilities. Prior to construction consult with utility companies to resolve any problems which may be created due to the location of utilities.

Place pavement markings in accordance with the Department of Transportation Pavement Marking TC-8600 Series Standards.

Maintenance and protection of traffic for the installation and maintenance of this traffic signal to be in accordance with Publication 213, Work Zone Traffic Control.

Threaded plate mast arm connections will not be permitted for this traffic signal permit.



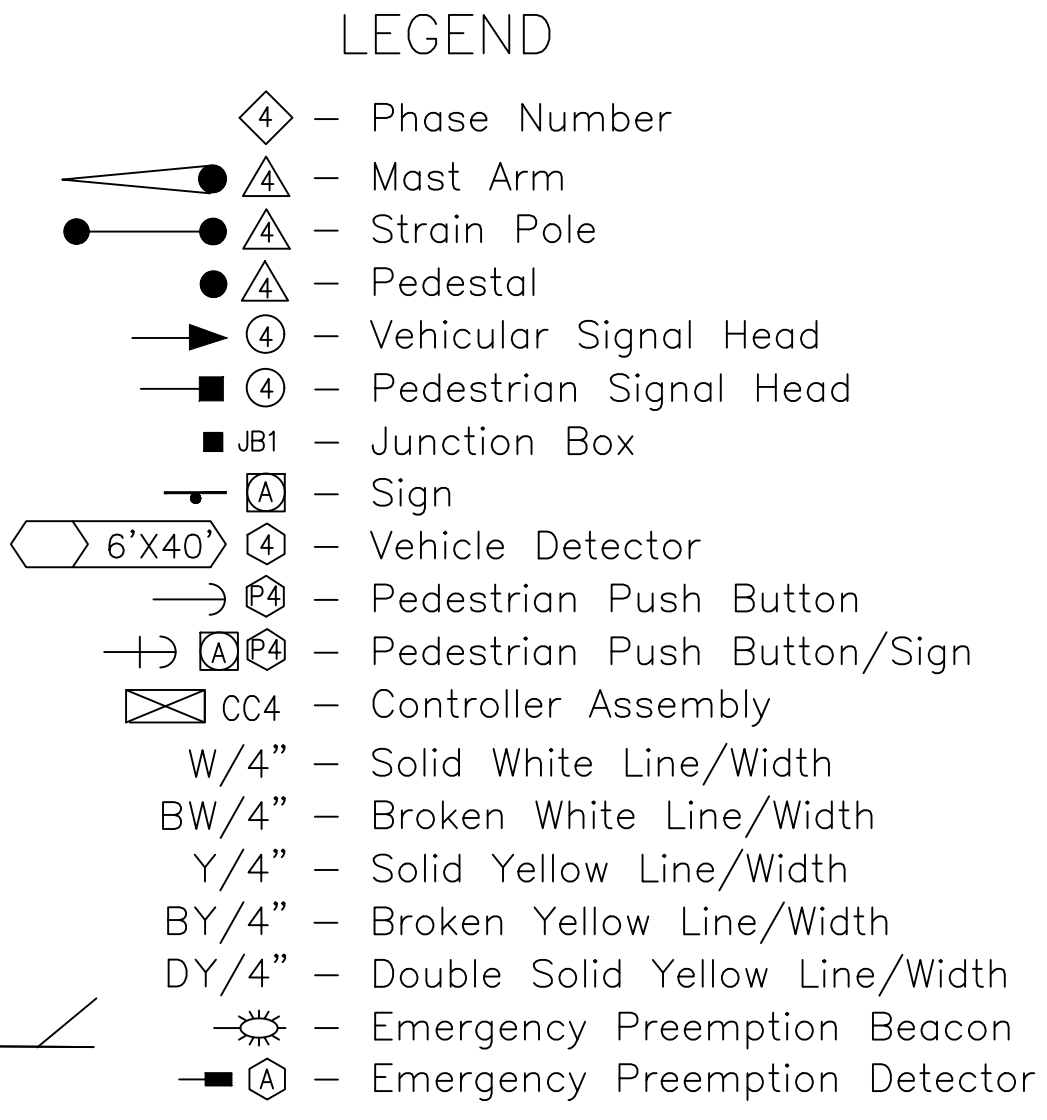
SIGN TABULATION **

PLAN SYMBOL	SERIES	SIZE	QTY.	MESSAGE
(A)	R10-3BL	9"x12"	5	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL
(B)	W3-3	36"x36"	1	SIGNAL AHEAD
(C)	R4-18	30"x30"	2	KEEP OFF SHOULDER
(D)	R3-7L	30"x30"	3	LEFT LANE MUST TURN LEFT
(E)	R3-5L	30"x36"	1	LEFT TURN
(F)	R3-5S	30"x36"	1	STRAIGHT-THROUGH
(G)	R3-5R	30"x36"	1	RIGHT TURN
(H)	R10-12	30"x36"	2	LEFT TURN YIELD ON GREEN
(J)	R10-10R	30"x36"	1	RIGHT TURN SIGNAL
(K)	M3-1	24"x12"	1	NORTH
(L)	M1-6	24"x30"	2	309
(M)	M6-4	21"x15"	2	
(N)	M6-4	21"x15"	1	
(P)	M3-3	24"x12"	1	SOUTH
(Q)	M4-5	24"x12"	1	TO
(R)	M1-4	24"x24"	1	22
(S)	R10-3BR	9"x12"	1	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL
(T)	D3-4	96"x16"	2	Ridgeview Dr
(U)	D3-4	78"x16"	2	Route 309
(V)	W3-3	48"x48"	1	SIGNAL AHEAD
(W)	R8-3A	18"x18"	2	NO PEDESTRIAN CROSSING
(X)	R3-4	24"x24"	2	NO U-TURN

SIGN NOTES:
 ** ALL SIGNS TO UTILIZE RETROREFLECTORIZED TYPE III, IV, VI, VII, IX, OR X SHEETING FOR LEGEND, BORDER, AND BACKGROUND.

* OVERHEAD STREET NAME SIGNS TO BE STRUCTURE MOUNTED FLAT SHEET ALUMINUM WITH STIFFENERS. OVERHEAD STREET NAME SIGNS TO CONSIST OF WHITE LEGEND AND BORDER ON GREEN BACKGROUND.

SIGNS DENOTED BY PLAN SYMBOL SHALL BE MAINTAINED BY PERMITEE; SIGNS DENOTED BY SERIES DESIGNATION SHALL BE MAINTAINED BY PENNDOT



County: LEHIGH

Municipality: SOUTH WHITEHALL TOWNSHIP

Intersection: SR 309 & RIDGEVIEW DRIVE (T-600)

Reviewed: _____

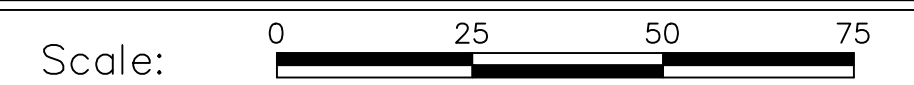
Municipal Official _____ Date _____

Reviewed: _____

District Traffic Signals Div. _____ Date _____

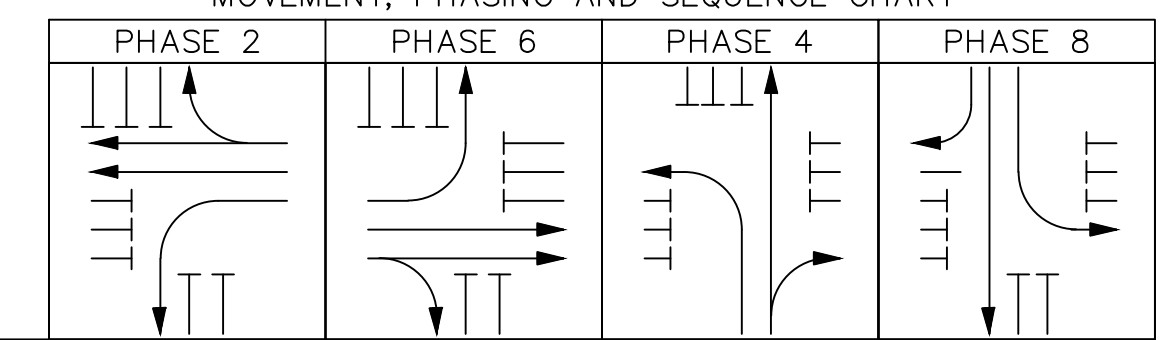
Recommended: _____

District Traffic Engineer _____ Date _____



DISTRICT	COUNTY	ROUTE	SECTION	SHEET
5-0	LEHIGH	0309		3 OF 3
SOUTH WHITEHALL TOWNSHIP				
PERMIT NO.	39-103-004	SHEET	3	OF 3
DATE ISSUED	4-30-71	DATE REVISED		

EMERGENCY PRE-EMPTION PHASING
MOVEMENT, PHASING AND SEQUENCE CHART



	INTERVAL			INTERVAL			INTERVAL			INTERVAL		
SIGNALS	12	13	14	15	16	17	18	19	20	21	22	23
1,2,12	G	Y	R	R	R	R	R	R	R	R	R	R
3,11	R	R	R	G	Y	R	R	R	R	R	R	R
4,5	R	R	R	R	R	R	R	R	R	R	R	R
6,7	R	R	R	R	R	R	G	Y	R	R	R	R
8	R	R	R	R	R	R	R	R	R	R	R	R
9,10,13	R	R	R	R	R	R	R	R	R	G	Y	R
14,15,16,17	H	H	H	H	H	H	H	H	H	H	H	H
18,19	H	H	H	H	H	H	H	H	H	H	H	H
FIXED TIME	**	5	3	**	5	3	**	4	4	**	4	4

EMERGENCY PRE-EMPTION OPERATION NOTES

Ⓞ SIGNALS TO INDICATE G WHEN RETURNING TO NORMAL OPERATION.
 Ⓞ SIGNALS TO INDICATE G/A WHEN RETURNING TO NORMAL OPERATION.
 IF THE PREEMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION AND THERE IS THE NEED TO ALLOW PREEMPTION BY EMERGENCY VEHICLES FROM NEARBY MUNICIPALITIES WITH DIFFERENT EMITTERS, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PREEMPTION.

EMERGENCY PRE-EMPTION NOTES

THE CONTROLLER SHALL BE EQUIPPED WITH EMERGENCY PREEMPTION FOR THE NORTHBOUND AND SOUTHBOUND APPROACHES OF SR 309 AND THE WESTBOUND AND EASTBOUND APPROACH OF RIDGEVIEW DRIVE WITH AN INDICATOR LIGHT FOR EACH APPROACH. THE INDICATOR LIGHT SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT AND, IT SHALL FLASH FOR THE APPROPRIATE APPROACH DURING THE GREEN INTERVAL IN THE PREEMPTION PHASE TO CONFIRM THAT THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL IMMEDIATELY TERMINATE ALL GREEN INDICATIONS, EXCEPT THE GREEN INDICATIONS FOR THE PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE, FOLLOWED BY SELECTIVE CLEARANCES DEPENDENT UPON THE PHASE IN WHICH THE PREEMPTION OCCURS. THE GREEN INDICATIONS FOR THE PREEMPTED APPROACH SHALL REMAIN GREEN FOR THE DURATION OF SIGNAL PREEMPTION WITH RED INDICATIONS DISPLAYED FOR ALL OTHER APPROACHES.

THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, DURING ANY CLEARANCE INTERVAL, SHALL TIME OUT ALL YELLOW AND RED INTERVALS, FOLLOWED BY THE GREEN INTERVAL OF THE PREEMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.

IF THE SIGNALS HAVE BEEN ACTUATED BY A PEDESTRIAN PUSHBUTTON, AND THE SIGNAL IS SUBSEQUENTLY PREEMPTED BY AN APPROACHING EMERGENCY VEHICLE, THE PEDESTRIAN WALK (WALKING PERSON) INTERVAL SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE PEDESTRIAN CLEARANCE INTERVAL. THIS INTERVAL SHALL TIME OUT, FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES BEFORE GOING INTO EMERGENCY PREEMPTION.

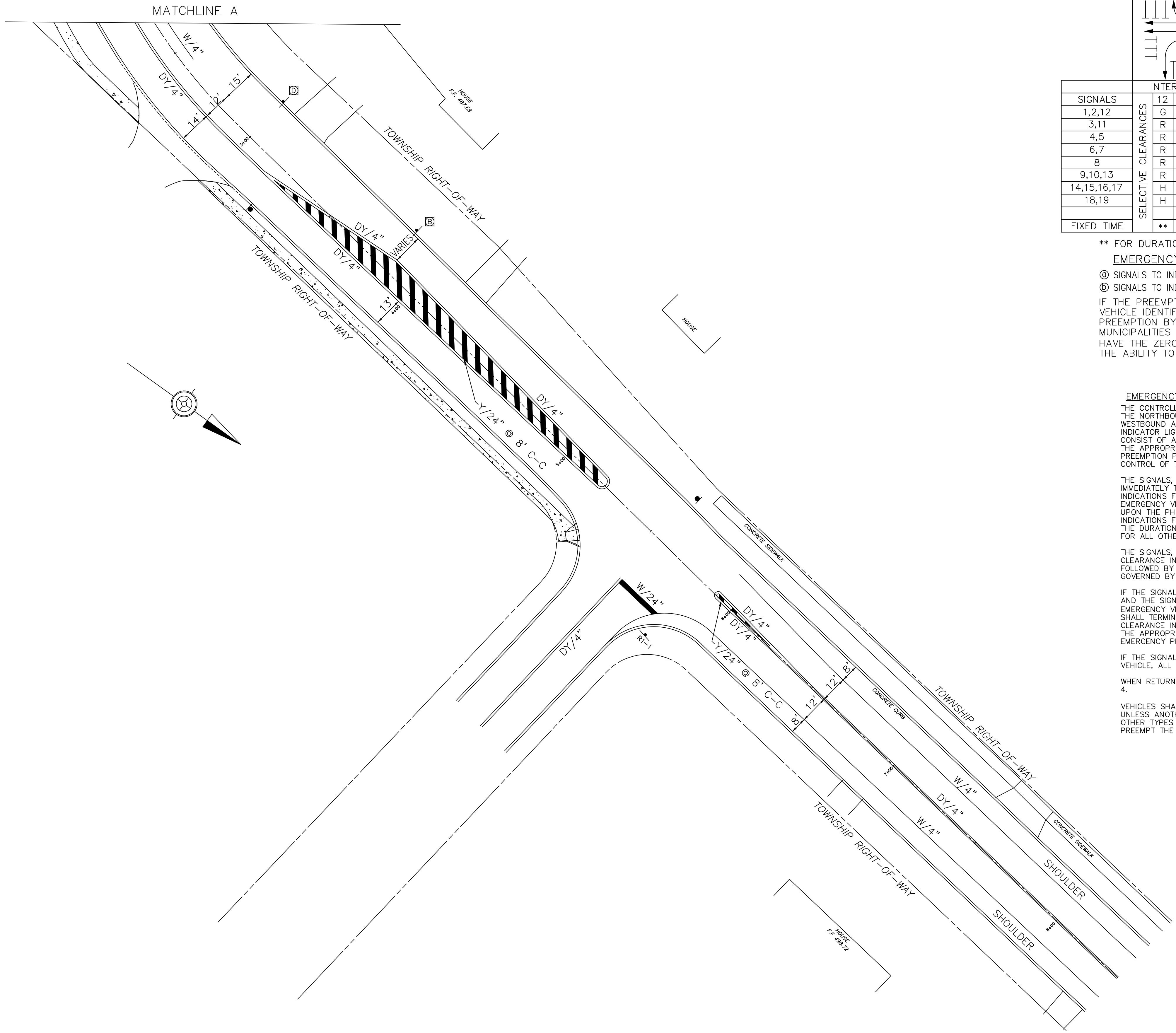
IF THE SIGNALS ARE FLASHING WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ALL SIGNALS SHALL REMAIN FLASHING.

WHEN RETURNING TO NORMAL OPERATION, GO TO PHASE 2+6, INTERVAL 4.

VEHICLES SHALL BE SERVED ON A "FIRST COME, FIRST SERVED" BASIS, UNLESS ANOTHER MODE OPERATION IS APPROVED BY PENNDOT. NO OTHER TYPES OR CLASSES OF VEHICLES SHALL BE PERMITTED TO PREEMPT THE TRAFFIC SIGNAL UNLESS APPROVED BY PENNDOT.

LEGEND

- ④ - Phase Number
- ▲ - Mast Arm
- - Strain Pole
- ▲ - Pedestal
- ➔④ - Vehicular Signal Head
- ④ - Pedestrian Signal Head
- JB1 - Junction Box
- ➔④ - Sign
- ⊃ 6'x40'④ - Vehicle Detector
- ➔④ - Pedestrian Push Button
- ➔④④ - Pedestrian Push Button/Sign
- CC4 - Controller Assembly
- W/4" - Solid White Line/Width
- BW/4" - Broken White Line/Width
- Y/4" - Solid Yellow Line/Width
- BY/4" - Broken Yellow Line/Width
- DY/4" - Double Solid Yellow Line/Width
- ⚡ - Emergency Preemption Beacon
- Ⓞ - Emergency Preemption Detector



County: LEHIGH

Municipality: SOUTH WHITEHALL TOWNSHIP

Intersection: SR 309 & RIDGEVIEW DRIVE (T-600)

Reviewed: _____ Date _____

Municipal Official _____ Date _____

Reviewed: _____ Date _____

District Traffic Signals Div. _____ Date _____

Recommended: _____ Date _____

District Traffic Engineer _____ Date _____

APPENDIX D:

Manual Traffic Count Printouts

2017 Counts



Traffic Planning and Design, Inc
 2500 East High Street
 Suite 650
 Pottstown, Pennsylvania, United States 19464
 610.326.3100

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 1

Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Turning Movement Data

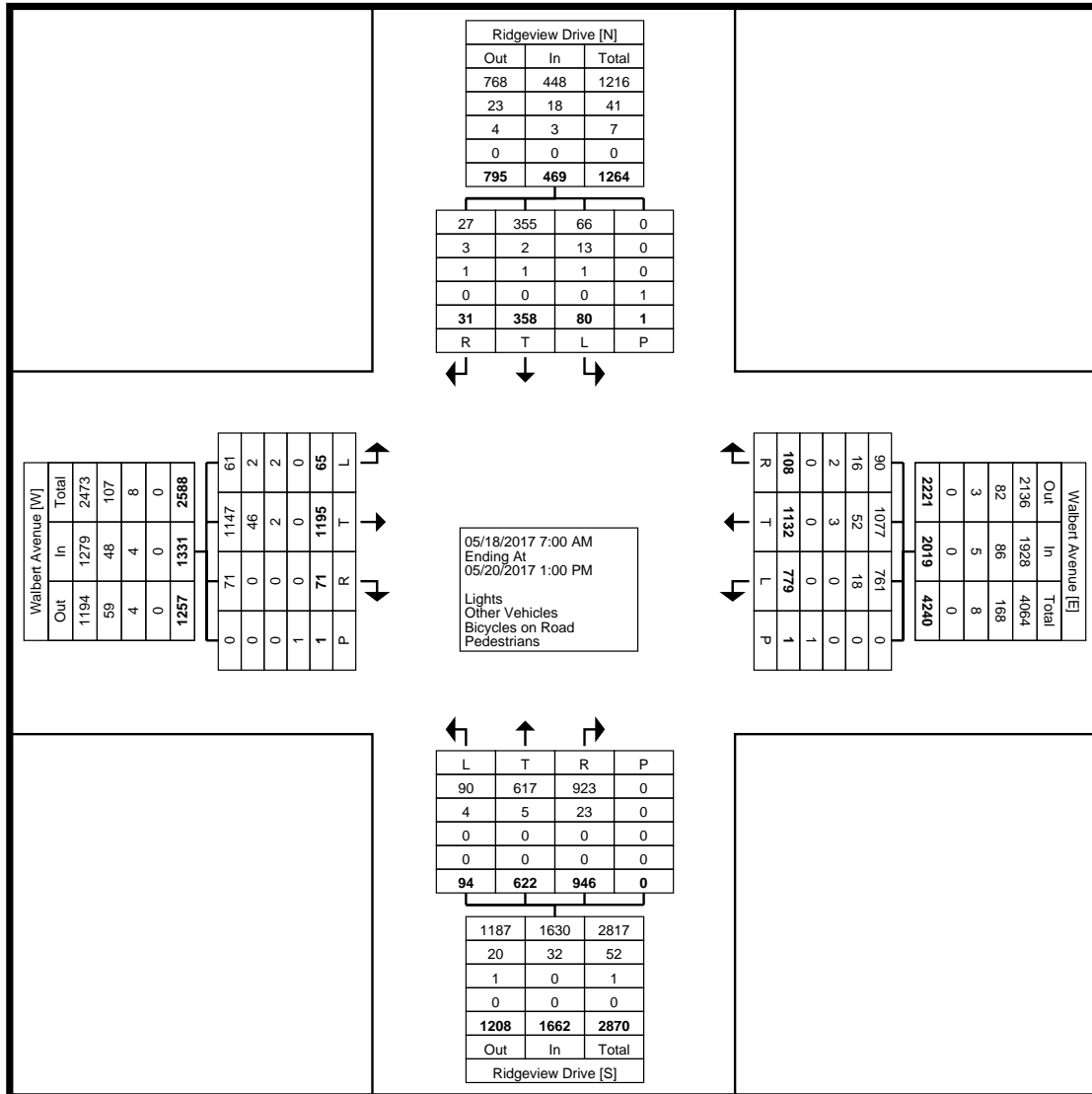
Start Time	Walbert Avenue Eastbound						Walbert Avenue Westbound						Ridgeview Drive Northbound						Ridgeview Drive Southbound						Int. Total	
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total		
7:00 AM	1	35	1	0	0	37	38	26	4	0	0	68	1	9	11	7	0	28	8	24	0	0	0	32	165	
7:15 AM	5	62	0	1	0	68	41	33	3	1	0	78	5	31	23	6	0	65	2	34	1	0	0	37	248	
7:30 AM	2	65	1	0	1	68	41	35	3	1	0	80	2	8	29	18	0	57	2	25	2	0	1	29	234	
7:45 AM	2	50	3	1	0	56	41	59	1	0	0	101	7	4	43	22	0	76	2	40	4	3	0	49	282	
Hourly Total	10	212	5	2	1	229	161	153	11	2	0	327	15	52	106	53	0	226	14	123	7	3	1	147	929	
8:00 AM	1	48	0	0	0	49	42	42	1	0	0	85	3	10	25	15	0	53	4	27	2	0	0	33	220	
8:15 AM	1	55	1	0	0	57	50	28	0	0	0	78	2	7	26	10	0	45	5	24	2	0	0	31	211	
8:30 AM	0	43	1	0	0	44	40	31	4	0	0	75	7	13	24	15	0	59	5	18	0	0	0	23	201	
8:45 AM	1	50	4	2	0	57	38	38	3	0	0	79	10	6	14	18	0	48	4	19	4	0	0	27	211	
Hourly Total	3	196	6	2	0	207	170	139	8	0	0	317	22	36	89	58	0	205	18	88	8	0	0	114	843	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	7	57	5	2	0	71	36	64	10	1	0	111	10	54	33	16	0	113	3	6	0	0	0	9	304	
4:15 PM	6	64	3	0	0	73	37	59	4	0	0	100	4	62	43	13	0	122	9	6	0	0	0	15	310	
4:30 PM	8	53	8	0	0	69	42	70	7	0	0	119	9	48	32	21	0	110	0	11	0	0	0	11	309	
4:45 PM	4	67	0	1	0	72	31	67	10	0	0	108	3	59	41	11	0	114	5	8	1	0	0	14	308	
Hourly Total	25	241	16	3	0	285	146	260	31	1	0	438	26	223	149	61	0	459	17	31	1	0	0	49	1231	
5:00 PM	4	57	4	0	0	65	56	79	8	2	0	145	5	70	32	12	0	119	7	7	1	0	0	15	344	
5:15 PM	2	54	1	1	0	58	28	55	4	1	0	88	1	68	66	19	0	154	3	5	1	0	0	9	309	
5:30 PM	7	67	1	0	0	75	20	65	10	3	0	98	8	80	50	18	0	156	1	10	0	0	0	11	340	
5:45 PM	5	50	1	0	0	56	34	64	4	0	0	102	2	29	34	12	0	77	4	11	1	0	0	16	251	
Hourly Total	18	228	7	1	0	254	138	263	26	6	0	433	16	247	182	61	0	506	15	33	3	0	0	51	1244	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	38	3	1	0	42	17	25	2	0	0	44	0	5	15	10	0	30	2	22	2	1	0	27	143	
11:15 AM	1	29	1	0	0	31	23	32	2	2	1	59	4	14	14	7	0	39	0	6	1	0	0	7	136	
11:30 AM	1	41	1	0	0	43	25	53	3	0	0	81	1	11	10	7	0	29	2	8	2	0	0	12	165	
11:45 AM	2	53	4	0	0	59	17	33	1	0	0	51	2	6	9	11	0	28	3	10	1	0	0	14	152	
Hourly Total	4	161	9	1	0	175	82	143	8	2	1	235	7	36	48	35	0	126	7	46	6	1	0	60	596	
12:00 PM	2	28	3	1	0	34	18	43	2	0	0	63	4	6	6	10	0	26	1	6	1	0	0	8	131	
12:15 PM	0	45	4	1	0	50	17	44	3	0	0	64	2	11	22	7	0	42	3	9	0	0	0	12	168	
12:30 PM	3	45	3	0	0	51	19	40	5	0	0	64	0	7	13	13	0	33	3	12	1	0	0	16	164	
12:45 PM	0	39	6	1	0	46	28	47	3	0	0	78	2	4	19	14	0	39	2	10	0	0	0	12	175	
Hourly Total	5	157	16	3	0	181	82	174	13	0	0	269	8	28	60	44	0	140	9	37	2	0	0	48	638	
Grand Total	65	1195	59	12	1	1331	779	1132	97	11	1	2019	94	622	634	312	0	1662	80	358	27	4	1	469	5481	
Approach %	4.9	89.8	4.4	0.9	-	-	38.6	56.1	4.8	0.5	-	-	5.7	37.4	38.1	18.8	-	-	17.1	76.3	5.8	0.9	-	-	-	
Total %	1.2	21.8	1.1	0.2	-	24.3	14.2	20.7	1.8	0.2	-	36.8	1.7	11.3	11.6	5.7	-	30.3	1.5	6.5	0.5	0.1	-	8.6	-	
Lights	61	1147	59	12	-	1279	761	1077	84	6	-	1928	90	617	617	306	-	1630	66	355	23	4	-	448	5285	
% Lights	93.8	96.0	100.0	100.0	-	96.1	97.7	95.1	86.6	54.5	-	95.5	95.7	99.2	97.3	98.1	-	98.1	82.5	99.2	85.2	100.0	-	95.5	96.4	
Other Vehicles	2	46	0	0	-	48	18	52	13	3	-	86	4	5	17	6	-	32	13	2	3	0	-	18	184	
% Other Vehicles	3.1	3.8	0.0	0.0	-	3.6	2.3	4.6	13.4	27.3	-	4.3	4.3	0.8	2.7	1.9	-	1.9	16.3	0.6	11.1	0.0	-	3.8	3.4	
Bicycles on Road	2	2	0	0	-	4	0	3	0	2	-	5	0	0	0	0	-	0	1	1	1	0	-	3	12	
% Bicycles on Road	3.1	0.2	0.0	0.0	-	0.3	0.0	0.3	0.0	18.2	-	0.2	0.0	0.0	0.0	0.0	-	0.0	1.3	0.3	3.7	0.0	-	0.6	0.2	
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	



Traffic Planning and Design, Inc
 2500 East High Street
 Suite 650
 Pottstown, Pennsylvania, United States 19464
 610.326.3100

Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 2



Turning Movement Data Plot



Traffic Planning and Design, Inc
 2500 East High Street
 Suite 650
 Pottstown, Pennsylvania, United States 19464
 610.326.3100

Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

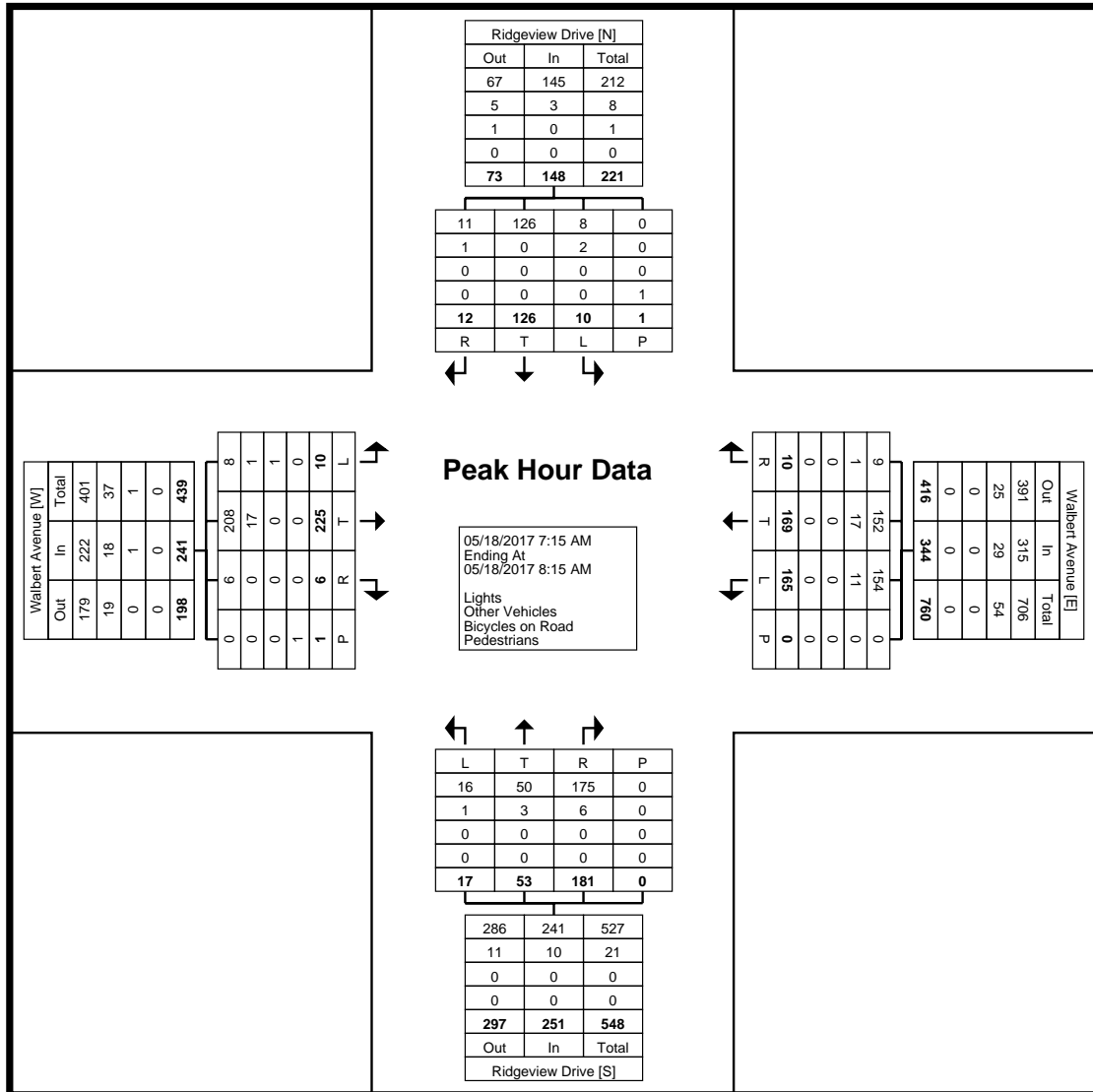
Start Time	Walbert Avenue Eastbound						Walbert Avenue Westbound						Ridgeview Drive Northbound						Ridgeview Drive Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:15 AM	5	62	0	1	0	68	41	33	3	1	0	78	5	31	23	6	0	65	2	34	1	0	0	37	248
7:30 AM	2	65	1	0	1	68	41	35	3	1	0	80	2	8	29	18	0	57	2	25	2	0	1	29	234
7:45 AM	2	50	3	1	0	56	41	59	1	0	0	101	7	4	43	22	0	76	2	40	4	3	0	49	282
8:00 AM	1	48	0	0	0	49	42	42	1	0	0	85	3	10	25	15	0	53	4	27	2	0	0	33	220
Total	10	225	4	2	1	241	165	169	8	2	0	344	17	53	120	61	0	251	10	126	9	3	1	148	984
Approach %	4.1	93.4	1.7	0.8	-	-	48.0	49.1	2.3	0.6	-	-	6.8	21.1	47.8	24.3	-	-	6.8	85.1	6.1	2.0	-	-	-
Total %	1.0	22.9	0.4	0.2	-	24.5	16.8	17.2	0.8	0.2	-	35.0	1.7	5.4	12.2	6.2	-	25.5	1.0	12.8	0.9	0.3	-	15.0	-
PHF	0.500	0.865	0.333	0.500	-	0.886	0.982	0.716	0.667	0.500	-	0.851	0.607	0.427	0.698	0.693	-	0.826	0.625	0.788	0.563	0.250	-	0.755	0.872
Lights	8	208	4	2	-	222	154	152	7	2	-	315	16	50	115	60	-	241	8	126	8	3	-	145	923
% Lights	80.0	92.4	100.0	100.0	-	92.1	93.3	89.9	87.5	100.0	-	91.6	94.1	94.3	95.8	98.4	-	96.0	80.0	100.0	88.9	100.0	-	98.0	93.8
Other Vehicles	1	17	0	0	-	18	11	17	1	0	-	29	1	3	5	1	-	10	2	0	1	0	-	3	60
% Other Vehicles	10.0	7.6	0.0	0.0	-	7.5	6.7	10.1	12.5	0.0	-	8.4	5.9	5.7	4.2	1.6	-	4.0	20.0	0.0	11.1	0.0	-	2.0	6.1
Bicycles on Road	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	10.0	0.0	0.0	0.0	-	0.4	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Traffic Planning and Design, Inc
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Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 4



Turning Movement Peak Hour Data Plot (7:15 AM)



Traffic Planning and Design, Inc
 2500 East High Street
 Suite 650
 Pottstown, Pennsylvania, United States 19464
 610.326.3100

Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 5

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Walbert Avenue Eastbound						Walbert Avenue Westbound						Ridgeview Drive Northbound						Ridgeview Drive Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
4:45 PM	4	67	0	1	0	72	31	67	10	0	0	108	3	59	41	11	0	114	5	8	1	0	0	14	308
5:00 PM	4	57	4	0	0	65	56	79	8	2	0	145	5	70	32	12	0	119	7	7	1	0	0	15	344
5:15 PM	2	54	1	1	0	58	28	55	4	1	0	88	1	68	66	19	0	154	3	5	1	0	0	9	309
5:30 PM	7	67	1	0	0	75	20	65	10	3	0	98	8	80	50	18	0	156	1	10	0	0	0	11	340
Total	17	245	6	2	0	270	135	266	32	6	0	439	17	277	189	60	0	543	16	30	3	0	0	49	1301
Approach %	6.3	90.7	2.2	0.7	-	-	30.8	60.6	7.3	1.4	-	-	3.1	51.0	34.8	11.0	-	-	32.7	61.2	6.1	0.0	-	-	-
Total %	1.3	18.8	0.5	0.2	-	20.8	10.4	20.4	2.5	0.5	-	33.7	1.3	21.3	14.5	4.6	-	41.7	1.2	2.3	0.2	0.0	-	3.8	-
PHF	0.607	0.914	0.375	0.500	-	0.900	0.603	0.842	0.800	0.500	-	0.757	0.531	0.866	0.716	0.789	-	0.870	0.571	0.750	0.750	0.000	-	0.817	0.945
Lights	17	238	6	2	-	263	134	261	28	4	-	427	17	277	185	58	-	537	13	29	3	0	-	45	1272
% Lights	100.0	97.1	100.0	100.0	-	97.4	99.3	98.1	87.5	66.7	-	97.3	100.0	100.0	97.9	96.7	-	98.9	81.3	96.7	100.0	-	-	91.8	97.8
Other Vehicles	0	6	0	0	-	6	1	5	4	2	-	12	0	0	4	2	-	6	3	0	0	0	-	3	27
% Other Vehicles	0.0	2.4	0.0	0.0	-	2.2	0.7	1.9	12.5	33.3	-	2.7	0.0	0.0	2.1	3.3	-	1.1	18.8	0.0	0.0	-	-	6.1	2.1
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	2
% Bicycles on Road	0.0	0.4	0.0	0.0	-	0.4	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	3.3	0.0	-	-	2.0	0.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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 2500 East High Street
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 610.326.3100

Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 7

Turning Movement Peak Hour Data (12:00 PM)

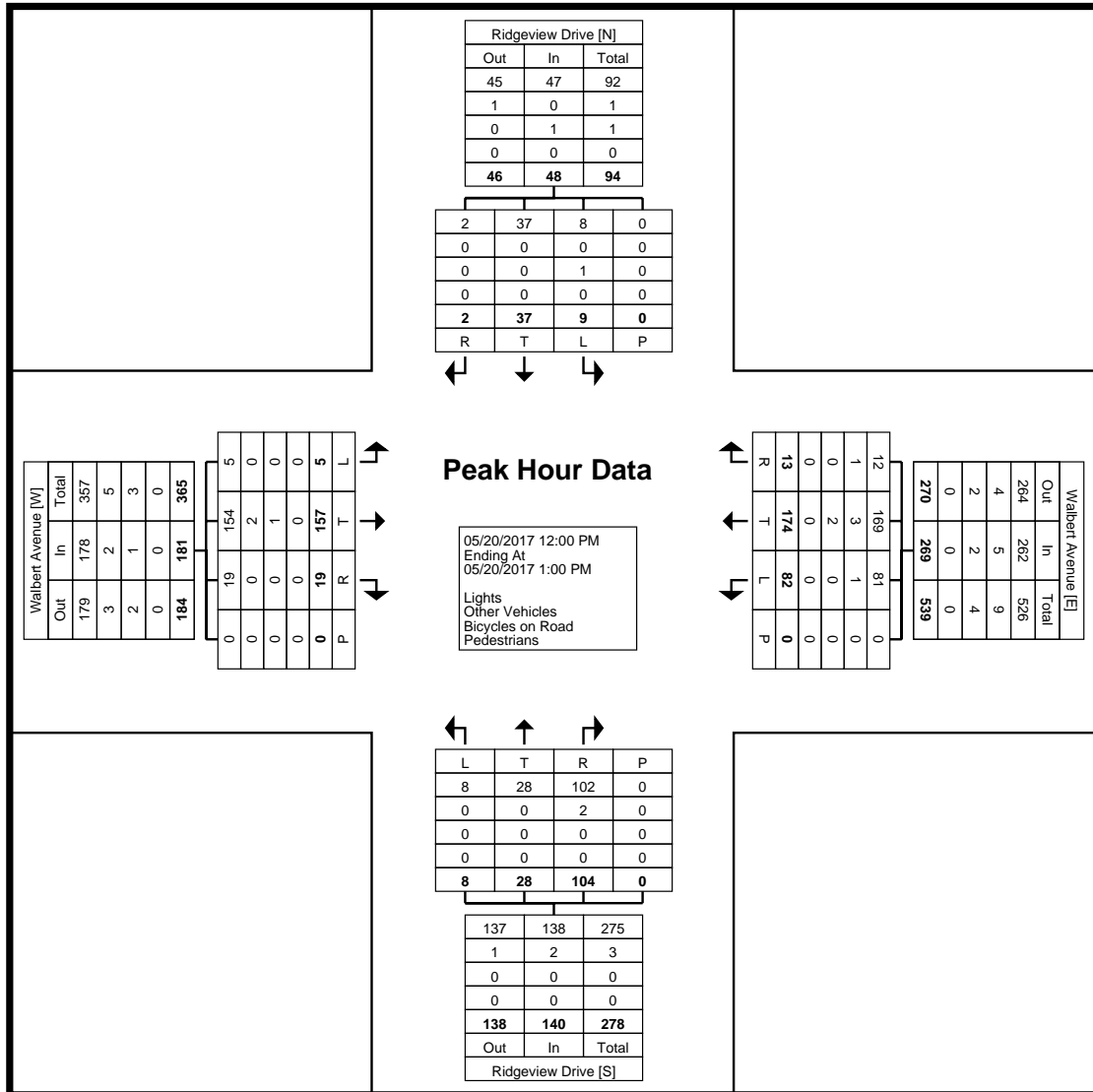
Start Time	Walbert Avenue Eastbound						Walbert Avenue Westbound						Ridgeview Drive Northbound						Ridgeview Drive Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
12:00 PM	2	28	3	1	0	34	18	43	2	0	0	63	4	6	6	10	0	26	1	6	1	0	0	8	131
12:15 PM	0	45	4	1	0	50	17	44	3	0	0	64	2	11	22	7	0	42	3	9	0	0	0	12	168
12:30 PM	3	45	3	0	0	51	19	40	5	0	0	64	0	7	13	13	0	33	3	12	1	0	0	16	164
12:45 PM	0	39	6	1	0	46	28	47	3	0	0	78	2	4	19	14	0	39	2	10	0	0	0	12	175
Total	5	157	16	3	0	181	82	174	13	0	0	269	8	28	60	44	0	140	9	37	2	0	0	48	638
Approach %	2.8	86.7	8.8	1.7	-	-	30.5	64.7	4.8	0.0	-	-	5.7	20.0	42.9	31.4	-	-	18.8	77.1	4.2	0.0	-	-	-
Total %	0.8	24.6	2.5	0.5	-	28.4	12.9	27.3	2.0	0.0	-	42.2	1.3	4.4	9.4	6.9	-	21.9	1.4	5.8	0.3	0.0	-	7.5	-
PHF	0.417	0.872	0.667	0.750	-	0.887	0.732	0.926	0.650	0.000	-	0.862	0.500	0.636	0.682	0.786	-	0.833	0.750	0.771	0.500	0.000	-	0.750	0.911
Lights	5	154	16	3	-	178	81	169	12	0	-	262	8	28	58	44	-	138	8	37	2	0	-	47	625
% Lights	100.0	98.1	100.0	100.0	-	98.3	98.8	97.1	92.3	-	-	97.4	100.0	100.0	96.7	100.0	-	98.6	88.9	100.0	100.0	-	-	97.9	98.0
Other Vehicles	0	2	0	0	-	2	1	3	1	0	-	5	0	0	2	0	-	2	0	0	0	0	-	0	9
% Other Vehicles	0.0	1.3	0.0	0.0	-	1.1	1.2	1.7	7.7	-	-	1.9	0.0	0.0	3.3	0.0	-	1.4	0.0	0.0	0.0	-	-	0.0	1.4
Bicycles on Road	0	1	0	0	-	1	0	2	0	0	-	2	0	0	0	0	-	0	1	0	0	0	-	1	4
% Bicycles on Road	0.0	0.6	0.0	0.0	-	0.6	0.0	1.1	0.0	-	-	0.7	0.0	0.0	0.0	0.0	-	0.0	11.1	0.0	0.0	-	-	2.1	0.6
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Planning and Design, Inc
 2500 East High Street
 Suite 650
 Pottstown, Pennsylvania, United States 19464
 610.326.3100

Counter: MIO:
 Set up By: JH:
 Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
 Ridgeview Drive
 Site Code: AM/PM & SAT
 Start Date: 05/18/2017
 Page No: 8



Turning Movement Peak Hour Data Plot (12:00 PM)



Traffic Planning and Design, Inc
2500 East High Street
Suite 650
Pottstown, Pennsylvania, United States 19464
610.326.3100

Counter: MIO:
Set up By: JH:
Location: 40.611551, -75.562677

Count Name: 010- Walbert Ave &
Ridgeview Drive
Site Code: AM/PM & SAT
Start Date: 05/18/2017
Page No: 9



Traffic Planning and Design, Inc
 2500 East High Street
 Suite 650
 Pottstown, Pennsylvania, United States 19464
 610.326.3100 jhudak@trafficpd.com

Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 1

Turning Movement Data

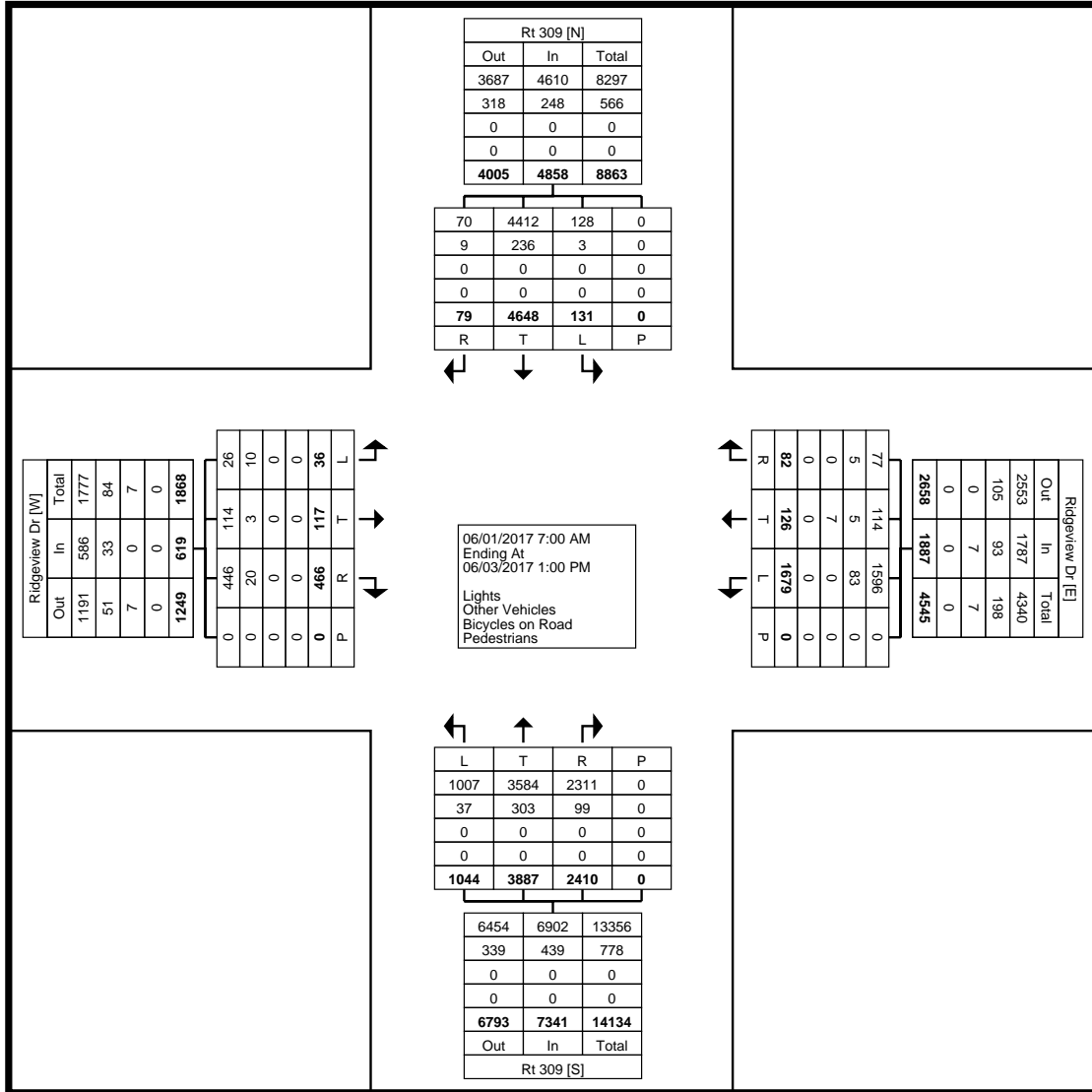
Start Time	Ridgeview Dr Eastbound						Ridgeview Dr Westbound						Rt 309 Northbound						Rt 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:00 AM	1	1	3	1	0	6	62	4	1	3	0	70	20	124	42	1	0	187	7	228	8	1	0	244	507
7:15 AM	1	3	2	1	0	7	82	9	4	0	0	95	35	167	86	6	0	294	15	241	4	0	0	260	656
7:30 AM	3	0	7	3	0	13	95	9	4	2	0	110	37	129	119	6	0	291	7	248	4	0	0	259	673
7:45 AM	0	1	7	2	0	10	111	6	2	0	0	119	50	185	166	0	0	401	1	217	8	0	0	226	756
Hourly Total	5	5	19	7	0	36	350	28	11	5	0	394	142	605	413	13	0	1173	30	934	24	1	0	989	2592
8:00 AM	1	0	13	1	0	15	80	9	2	1	0	92	73	150	129	17	0	369	1	212	4	1	0	218	694
8:15 AM	2	1	10	0	0	13	82	8	3	1	0	94	66	153	109	15	0	343	2	204	7	0	0	213	663
8:30 AM	1	3	13	0	0	17	85	7	4	0	0	96	47	163	46	2	0	258	5	199	2	1	0	207	578
8:45 AM	3	3	7	3	0	16	52	9	1	0	0	62	50	150	52	0	0	252	3	251	1	1	0	256	586
Hourly Total	7	7	43	4	0	61	299	33	10	2	0	344	236	616	336	34	0	1222	11	866	14	3	0	894	2521
9:00 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	2	0	0	0	2	4
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	2	0	0	0	2	4
4:00 PM	1	14	5	28	0	48	74	4	1	1	0	80	72	176	124	9	0	381	1	177	1	1	0	180	689
4:15 PM	0	5	8	24	0	37	73	5	0	0	0	78	73	192	102	8	0	375	4	207	1	0	0	212	702
4:30 PM	1	8	6	31	0	46	67	6	4	0	0	77	63	138	94	4	0	299	3	194	3	1	0	201	623
4:45 PM	1	13	12	26	0	52	44	4	1	1	0	50	88	194	167	18	0	467	1	173	2	0	0	176	745
Hourly Total	3	40	31	109	0	183	258	19	6	2	0	285	296	700	487	39	0	1522	9	751	7	2	0	769	2759
5:00 PM	5	22	75	9	0	111	72	8	3	2	0	85	52	188	127	11	0	378	5	204	0	0	0	209	783
5:15 PM	2	12	30	5	0	49	67	6	2	1	0	76	93	151	130	10	0	384	6	177	3	0	0	186	695
5:30 PM	3	13	28	4	0	48	49	5	0	0	0	54	72	160	157	15	0	404	4	148	2	0	0	154	660
5:45 PM	1	5	30	3	0	39	51	1	0	0	0	52	52	169	126	4	0	351	3	182	0	0	0	185	627
Hourly Total	11	52	163	21	0	247	239	20	5	3	0	267	269	668	540	40	0	1517	18	711	5	0	0	734	2765
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	2	3	6	0	12	48	3	4	0	0	55	15	148	54	1	0	218	8	164	0	0	0	172	457
11:15 AM	2	2	8	7	0	19	66	2	6	0	0	74	13	152	58	3	0	226	12	185	3	0	0	200	519
11:30 AM	0	1	3	2	0	6	83	2	2	0	0	87	13	148	52	4	0	217	8	189	1	0	0	198	508
11:45 AM	3	2	1	5	0	11	85	0	10	2	0	97	13	148	60	9	0	230	7	157	2	1	0	167	505
Hourly Total	6	7	15	20	0	48	282	7	22	2	0	313	54	596	224	17	0	891	35	695	6	1	0	737	1989
12:00 PM	1	3	3	2	0	9	64	5	3	0	0	72	12	173	77	5	0	267	5	186	3	1	0	195	543
12:15 PM	0	1	8	3	0	12	58	6	1	1	0	66	17	158	45	10	0	230	9	155	6	1	0	171	479
12:30 PM	2	0	5	5	0	12	58	5	4	4	0	71	5	165	49	11	0	230	5	195	3	0	0	203	516
12:45 PM	1	2	4	4	0	11	70	3	1	0	0	74	13	206	51	18	0	288	9	153	2	0	0	164	537
Hourly Total	4	6	20	14	0	44	250	19	9	5	0	283	47	702	222	44	0	1015	28	689	14	2	0	733	2075
Grand Total	36	117	291	175	0	619	1679	126	63	19	0	1887	1044	3887	2223	187	0	7341	131	4648	70	9	0	4858	14705
Approach %	5.8	18.9	47.0	28.3	-	-	89.0	6.7	3.3	1.0	-	-	14.2	52.9	30.3	2.5	-	-	2.7	95.7	1.4	0.2	-	-	-
Total %	0.2	0.8	2.0	1.2	-	4.2	11.4	0.9	0.4	0.1	-	12.8	7.1	26.4	15.1	1.3	-	49.9	0.9	31.6	0.5	0.1	-	33.0	-
Lights	26	114	275	171	-	586	1596	114	59	18	-	1787	1007	3584	2128	183	-	6902	128	4412	62	8	-	4610	13885
% Lights	72.2	97.4	94.5	97.7	-	94.7	95.1	90.5	93.7	94.7	-	94.7	96.5	92.2	95.7	97.9	-	94.0	97.7	94.9	88.6	88.9	-	94.9	94.4
Other Vehicles	10	3	16	4	-	33	83	5	4	1	-	93	37	303	95	4	-	439	3	236	8	1	-	248	813
% Other Vehicles	27.8	2.6	5.5	2.3	-	5.3	4.9	4.0	6.3	5.3	-	4.9	3.5	7.8	4.3	2.1	-	6.0	2.3	5.1	11.4	11.1	-	5.1	5.5
Bicycles on Road	0	0	0	0	-	0	0	7	0	0	-	7	0	0	0	0	-	0	0	0	0	0	-	0	7
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	5.6	0.0	0.0	-	0.4	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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 610.326.3100 jhudak@trafficpd.com

Counted By: Mio
 Set Up By: JH:
 Weather: Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 2



Turning Movement Data Plot



Traffic Planning and Design, Inc
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Counted By: Mio:
 Set Up By: JH:
 Weather:Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 3

Turning Movement Peak Hour Data (7:30 AM)

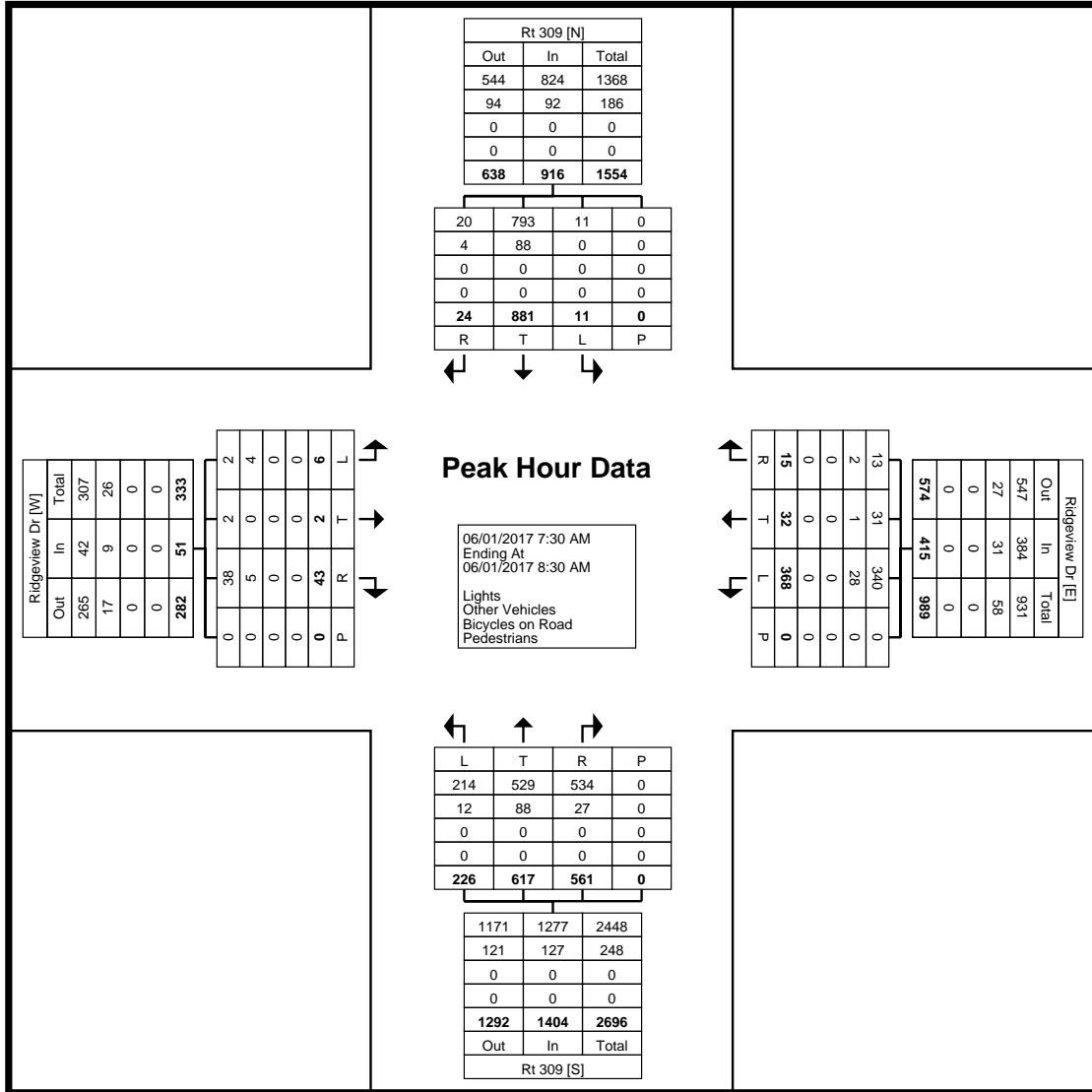
Start Time	Ridgeview Dr Eastbound						Ridgeview Dr Westbound						Rt 309 Northbound						Rt 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:30 AM	3	0	7	3	0	13	95	9	4	2	0	110	37	129	119	6	0	291	7	248	4	0	0	259	673
7:45 AM	0	1	7	2	0	10	111	6	2	0	0	119	50	185	166	0	0	401	1	217	8	0	0	226	756
8:00 AM	1	0	13	1	0	15	80	9	2	1	0	92	73	150	129	17	0	369	1	212	4	1	0	218	694
8:15 AM	2	1	10	0	0	13	82	8	3	1	0	94	66	153	109	15	0	343	2	204	7	0	0	213	663
Total	6	2	37	6	0	51	368	32	11	4	0	415	226	617	523	38	0	1404	11	881	23	1	0	916	2786
Approach %	11.8	3.9	72.5	11.8	-	-	88.7	7.7	2.7	1.0	-	-	16.1	43.9	37.3	2.7	-	-	1.2	96.2	2.5	0.1	-	-	-
Total %	0.2	0.1	1.3	0.2	-	1.8	13.2	1.1	0.4	0.1	-	14.9	8.1	22.1	18.8	1.4	-	50.4	0.4	31.6	0.8	0.0	-	32.9	-
PHF	0.500	0.500	0.712	0.500	-	0.850	0.829	0.889	0.688	0.500	-	0.872	0.774	0.834	0.788	0.559	-	0.875	0.393	0.888	0.719	0.250	-	0.884	0.921
Lights	2	2	32	6	-	42	340	31	9	4	-	384	214	529	496	38	-	1277	11	793	20	0	-	824	2527
% Lights	33.3	100.0	86.5	100.0	-	82.4	92.4	96.9	81.8	100.0	-	92.5	94.7	85.7	94.8	100.0	-	91.0	100.0	90.0	87.0	0.0	-	90.0	90.7
Other Vehicles	4	0	5	0	-	9	28	1	2	0	-	31	12	88	27	0	-	127	0	88	3	1	-	92	259
% Other Vehicles	66.7	0.0	13.5	0.0	-	17.6	7.6	3.1	18.2	0.0	-	7.5	5.3	14.3	5.2	0.0	-	9.0	0.0	10.0	13.0	100.0	-	10.0	9.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio
 Set Up By: JH:
 Weather: Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 4



Turning Movement Peak Hour Data Plot (7:30 AM)



Traffic Planning and Design, Inc
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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 5

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Ridgeview Dr Eastbound						Ridgeview Dr Westbound						Rt 309 Northbound						Rt 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
4:45 PM	1	13	12	26	0	52	44	4	1	1	0	50	88	194	167	18	0	467	1	173	2	0	0	176	745
5:00 PM	5	22	75	9	0	111	72	8	3	2	0	85	52	188	127	11	0	378	5	204	0	0	0	209	783
5:15 PM	2	12	30	5	0	49	67	6	2	1	0	76	93	151	130	10	0	384	6	177	3	0	0	186	695
5:30 PM	3	13	28	4	0	48	49	5	0	0	0	54	72	160	157	15	0	404	4	148	2	0	0	154	660
Total	11	60	145	44	0	260	232	23	6	4	0	265	305	693	581	54	0	1633	16	702	7	0	0	725	2883
Approach %	4.2	23.1	55.8	16.9	-	-	87.5	8.7	2.3	1.5	-	-	18.7	42.4	35.6	3.3	-	-	2.2	96.8	1.0	0.0	-	-	-
Total %	0.4	2.1	5.0	1.5	-	9.0	8.0	0.8	0.2	0.1	-	9.2	10.6	24.0	20.2	1.9	-	56.6	0.6	24.3	0.2	0.0	-	25.1	-
PHF	0.550	0.682	0.483	0.423	-	0.586	0.806	0.719	0.500	0.500	-	0.779	0.820	0.893	0.870	0.750	-	0.874	0.667	0.860	0.583	0.000	-	0.867	0.920
Lights	11	60	144	43	-	258	220	18	5	4	-	247	297	653	563	53	-	1566	16	676	7	0	-	699	2770
% Lights	100.0	100.0	99.3	97.7	-	99.2	94.8	78.3	83.3	100.0	-	93.2	97.4	94.2	96.9	98.1	-	95.9	100.0	96.3	100.0	-	-	96.4	96.1
Other Vehicles	0	0	1	1	-	2	12	1	1	0	-	14	8	40	18	1	-	67	0	26	0	0	-	26	109
% Other Vehicles	0.0	0.0	0.7	2.3	-	0.8	5.2	4.3	16.7	0.0	-	5.3	2.6	5.8	3.1	1.9	-	4.1	0.0	3.7	0.0	-	-	3.6	3.8
Bicycles on Road	0	0	0	0	-	0	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	4
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	17.4	0.0	0.0	-	1.5	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio:
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 Weather: Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 7

Turning Movement Peak Hour Data (11:15 AM)

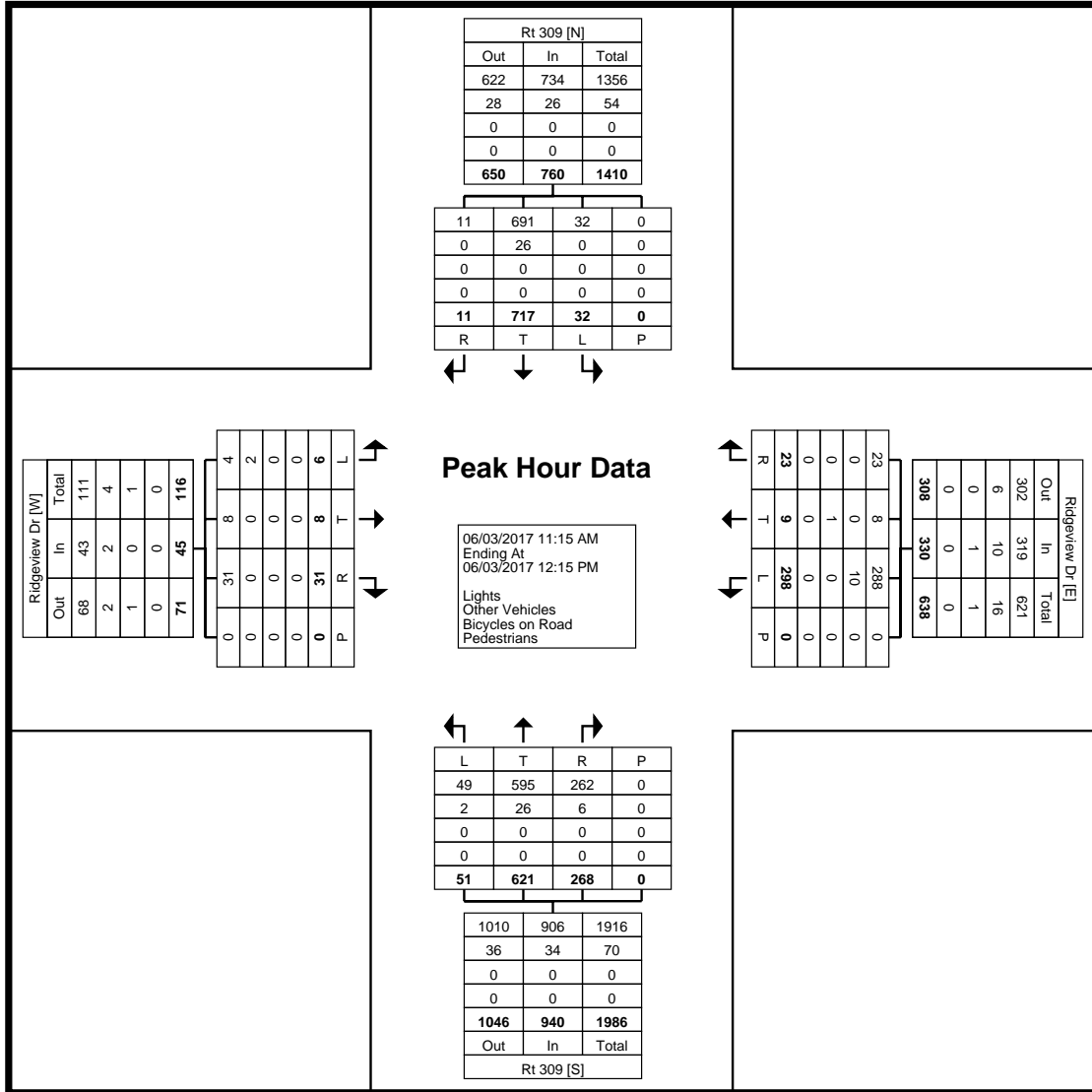
Start Time	Ridgeview Dr Eastbound						Ridgeview Dr Westbound						Rt 309 Northbound						Rt 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
11:15 AM	2	2	8	7	0	19	66	2	6	0	0	74	13	152	58	3	0	226	12	185	3	0	0	200	519
11:30 AM	0	1	3	2	0	6	83	2	2	0	0	87	13	148	52	4	0	217	8	189	1	0	0	198	508
11:45 AM	3	2	1	5	0	11	85	0	10	2	0	97	13	148	60	9	0	230	7	157	2	1	0	167	505
12:00 PM	1	3	3	2	0	9	64	5	3	0	0	72	12	173	77	5	0	267	5	186	3	1	0	195	543
Total	6	8	15	16	0	45	298	9	21	2	0	330	51	621	247	21	0	940	32	717	9	2	0	760	2075
Approach %	13.3	17.8	33.3	35.6	-	-	90.3	2.7	6.4	0.6	-	-	5.4	66.1	26.3	2.2	-	-	4.2	94.3	1.2	0.3	-	-	-
Total %	0.3	0.4	0.7	0.8	-	2.2	14.4	0.4	1.0	0.1	-	15.9	2.5	29.9	11.9	1.0	-	45.3	1.5	34.6	0.4	0.1	-	36.6	-
PHF	0.500	0.667	0.469	0.571	-	0.592	0.876	0.450	0.525	0.250	-	0.851	0.981	0.897	0.802	0.583	-	0.880	0.667	0.948	0.750	0.500	-	0.950	0.955
Lights	4	8	15	16	-	43	288	8	21	2	-	319	49	595	241	21	-	906	32	691	9	2	-	734	2002
% Lights	66.7	100.0	100.0	100.0	-	95.6	96.6	88.9	100.0	100.0	-	96.7	96.1	95.8	97.6	100.0	-	96.4	100.0	96.4	100.0	100.0	-	96.6	96.5
Other Vehicles	2	0	0	0	-	2	10	0	0	0	-	10	2	26	6	0	-	34	0	26	0	0	-	26	72
% Other Vehicles	33.3	0.0	0.0	0.0	-	4.4	3.4	0.0	0.0	0.0	-	3.0	3.9	4.2	2.4	0.0	-	3.6	0.0	3.6	0.0	0.0	-	3.4	3.5
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	11.1	0.0	0.0	-	0.3	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Planning and Design, Inc
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Counted By: Mio
 Set Up By: JH:
 Weather: Clear:

Count Name: Rt 309 &
 Ridgeview Dr Am/Pm/Sat
 Site Code:
 Start Date: 06/01/2017
 Page No: 8



Turning Movement Peak Hour Data Plot (11:15 AM)



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Counted By: Mio:
Set Up By: JH:
Weather: Clear:

Count Name: Rt 309 &
Ridgeview Dr Am/Pm/Sat
Site Code:
Start Date: 06/01/2017
Page No: 9

2020 Counts



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Route 309 &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 1

Turning Movement Data

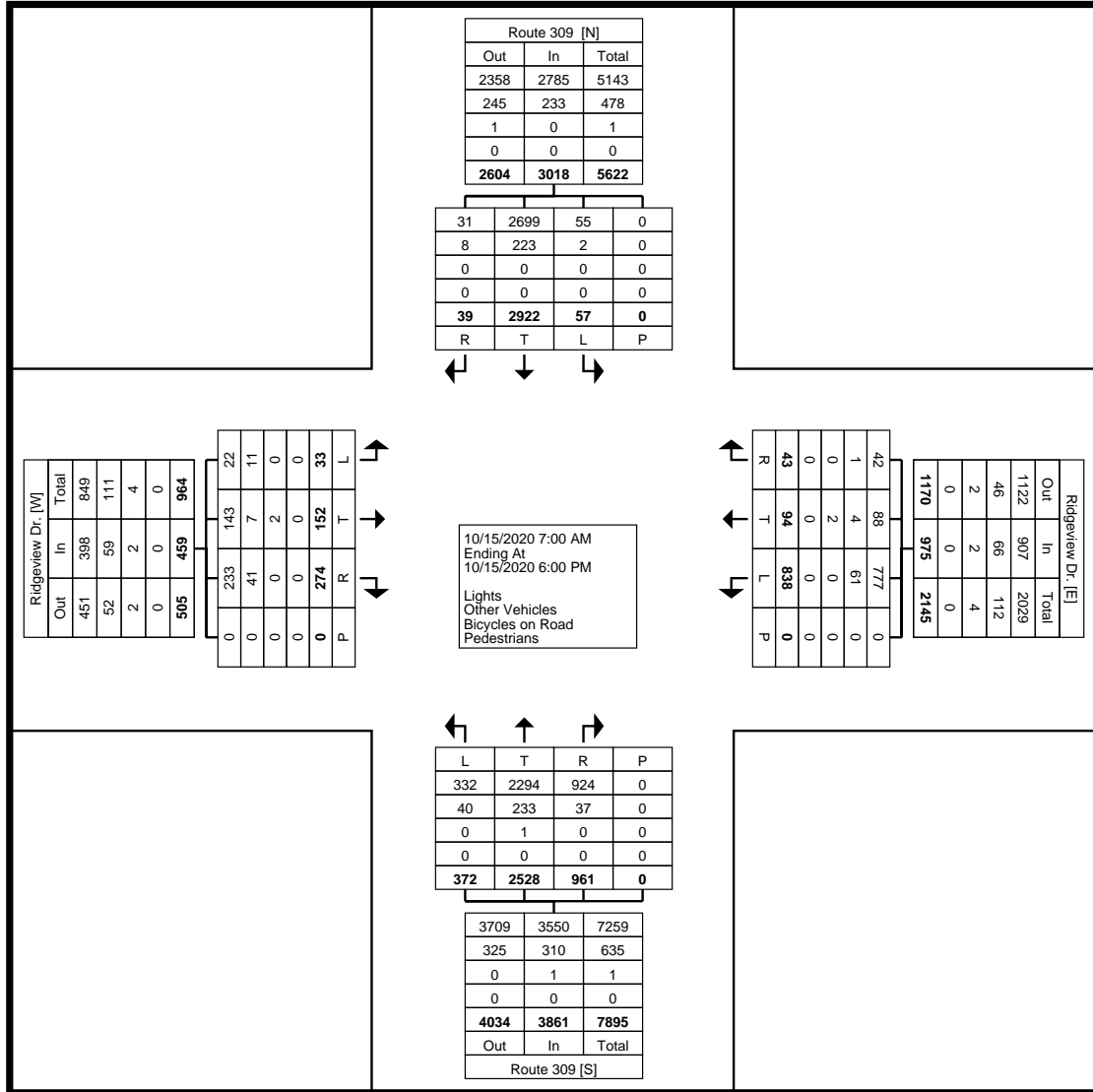
Start Time	Ridgeview Dr. Eastbound						Ridgeview Dr. Westbound						Route 309 Northbound						Route 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:00 AM	4	17	2	1	0	24	37	3	0	1	0	41	19	143	39	2	0	203	7	182	2	0	0	191	459
7:15 AM	2	8	2	2	0	14	56	5	0	2	0	63	17	155	35	6	0	213	13	192	3	0	0	208	498
7:30 AM	2	5	9	7	0	23	92	5	3	2	0	102	27	148	35	4	0	214	1	219	2	0	0	222	561
7:45 AM	3	8	10	11	0	32	68	9	1	0	0	78	35	163	37	5	0	240	1	206	2	1	0	210	560
Hourly Total	11	38	23	21	0	93	253	22	4	5	0	284	98	609	146	17	0	870	22	799	9	1	0	831	2078
8:00 AM	1	3	5	3	0	12	58	3	0	0	0	61	29	142	23	3	0	197	4	196	3	0	0	203	473
8:15 AM	2	2	6	8	0	18	45	7	1	1	0	54	24	112	42	5	0	183	5	189	2	0	0	196	451
8:30 AM	3	7	3	2	0	15	47	6	3	1	0	57	24	128	30	2	0	184	2	163	5	0	0	170	426
8:45 AM	3	3	6	9	0	21	44	4	1	0	0	49	21	119	30	3	0	173	2	163	2	2	0	169	412
Hourly Total	9	15	20	22	0	66	194	20	5	2	0	221	98	501	125	13	0	737	13	711	12	2	0	738	1762
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	1	11	20	7	0	39	58	8	5	0	0	71	30	160	72	8	0	270	3	196	2	0	0	201	581
4:15 PM	2	12	9	6	0	29	39	9	5	0	0	53	13	166	76	0	0	255	2	182	4	0	0	188	525
4:30 PM	0	17	15	14	0	46	42	12	2	1	0	57	15	191	83	6	0	295	5	167	1	0	0	173	571
4:45 PM	0	13	9	16	0	38	54	6	0	0	0	60	21	176	65	10	0	272	1	181	0	1	0	183	553
Hourly Total	3	53	53	43	0	152	193	35	12	1	0	241	79	693	296	24	0	1092	11	726	7	1	0	745	2230
5:00 PM	7	19	22	18	0	66	53	6	5	0	0	64	40	199	103	12	0	354	2	178	0	0	0	180	664
5:15 PM	2	10	6	8	0	26	65	3	2	0	0	70	27	182	86	7	0	302	5	173	2	0	0	180	578
5:30 PM	0	11	11	11	0	33	46	4	0	0	0	50	14	177	63	9	0	263	1	173	1	0	0	175	521
5:45 PM	1	6	10	6	0	23	34	4	5	2	0	45	16	167	55	5	0	243	3	162	3	1	0	169	480
Hourly Total	10	46	49	43	0	148	198	17	12	2	0	229	97	725	307	33	0	1162	11	686	6	1	0	704	2243
Grand Total	33	152	145	129	0	459	838	94	33	10	0	975	372	2528	874	87	0	3861	57	2922	34	5	0	3018	8313
Approach %	7.2	33.1	31.6	28.1	-	-	85.9	9.6	3.4	1.0	-	-	9.6	65.5	22.6	2.3	-	-	1.9	96.8	1.1	0.2	-	-	-
Total %	0.4	1.8	1.7	1.6	-	5.5	10.1	1.1	0.4	0.1	-	11.7	4.5	30.4	10.5	1.0	-	46.4	0.7	35.1	0.4	0.1	-	36.3	-
Lights	22	143	121	112	-	398	777	88	32	10	-	907	332	2294	840	84	-	3550	55	2699	28	3	-	2785	7640
% Lights	66.7	94.1	83.4	86.8	-	86.7	92.7	93.6	97.0	100.0	-	93.0	89.2	90.7	96.1	96.6	-	91.9	96.5	92.4	82.4	60.0	-	92.3	91.9
Other Vehicles	11	7	24	17	-	59	61	4	1	0	-	66	40	233	34	3	-	310	2	223	6	2	-	233	668
% Other Vehicles	33.3	4.6	16.6	13.2	-	12.9	7.3	4.3	3.0	0.0	-	6.8	10.8	9.2	3.9	3.4	-	8.0	3.5	7.6	17.6	40.0	-	7.7	8.0
Bicycles on Road	0	2	0	0	-	2	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	5
% Bicycles on Road	0.0	1.3	0.0	0.0	-	0.4	0.0	2.1	0.0	0.0	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio
 Set Up By: JH:
 Weather: Clear

Count Name: Route 309 &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 2



Turning Movement Data Plot



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Route 309 &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Ridgeview Dr. Eastbound						Ridgeview Dr. Westbound						Route 309 Northbound						Route 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:15 AM	2	8	2	2	0	14	56	5	0	2	0	63	17	155	35	6	0	213	13	192	3	0	0	208	498
7:30 AM	2	5	9	7	0	23	92	5	3	2	0	102	27	148	35	4	0	214	1	219	2	0	0	222	561
7:45 AM	3	8	10	11	0	32	68	9	1	0	0	78	35	163	37	5	0	240	1	206	2	1	0	210	560
8:00 AM	1	3	5	3	0	12	58	3	0	0	0	61	29	142	23	3	0	197	4	196	3	0	0	203	473
Total	8	24	26	23	0	81	274	22	4	4	0	304	108	608	130	18	0	864	19	813	10	1	0	843	2092
Approach %	9.9	29.6	32.1	28.4	-	-	90.1	7.2	1.3	1.3	-	-	12.5	70.4	15.0	2.1	-	-	2.3	96.4	1.2	0.1	-	-	-
Total %	0.4	1.1	1.2	1.1	-	3.9	13.1	1.1	0.2	0.2	-	14.5	5.2	29.1	6.2	0.9	-	41.3	0.9	38.9	0.5	0.0	-	40.3	-
PHF	0.667	0.750	0.650	0.523	-	0.633	0.745	0.611	0.333	0.500	-	0.745	0.771	0.933	0.878	0.750	-	0.900	0.365	0.928	0.833	0.250	-	0.949	0.932
Lights	4	21	12	16	-	53	247	20	3	4	-	274	91	524	117	17	-	749	18	738	9	1	-	766	1842
% Lights	50.0	87.5	46.2	69.6	-	65.4	90.1	90.9	75.0	100.0	-	90.1	84.3	86.2	90.0	94.4	-	86.7	94.7	90.8	90.0	100.0	-	90.9	88.0
Other Vehicles	4	3	14	7	-	28	27	2	1	0	-	30	17	83	13	1	-	114	1	75	1	0	-	77	249
% Other Vehicles	50.0	12.5	53.8	30.4	-	34.6	9.9	9.1	25.0	0.0	-	9.9	15.7	13.7	10.0	5.6	-	13.2	5.3	9.2	10.0	0.0	-	9.1	11.9
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio:
 Set Up By: JH:
 Weather:Clear:

Count Name: Route 309 &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 5

Turning Movement Peak Hour Data (4:30 PM)

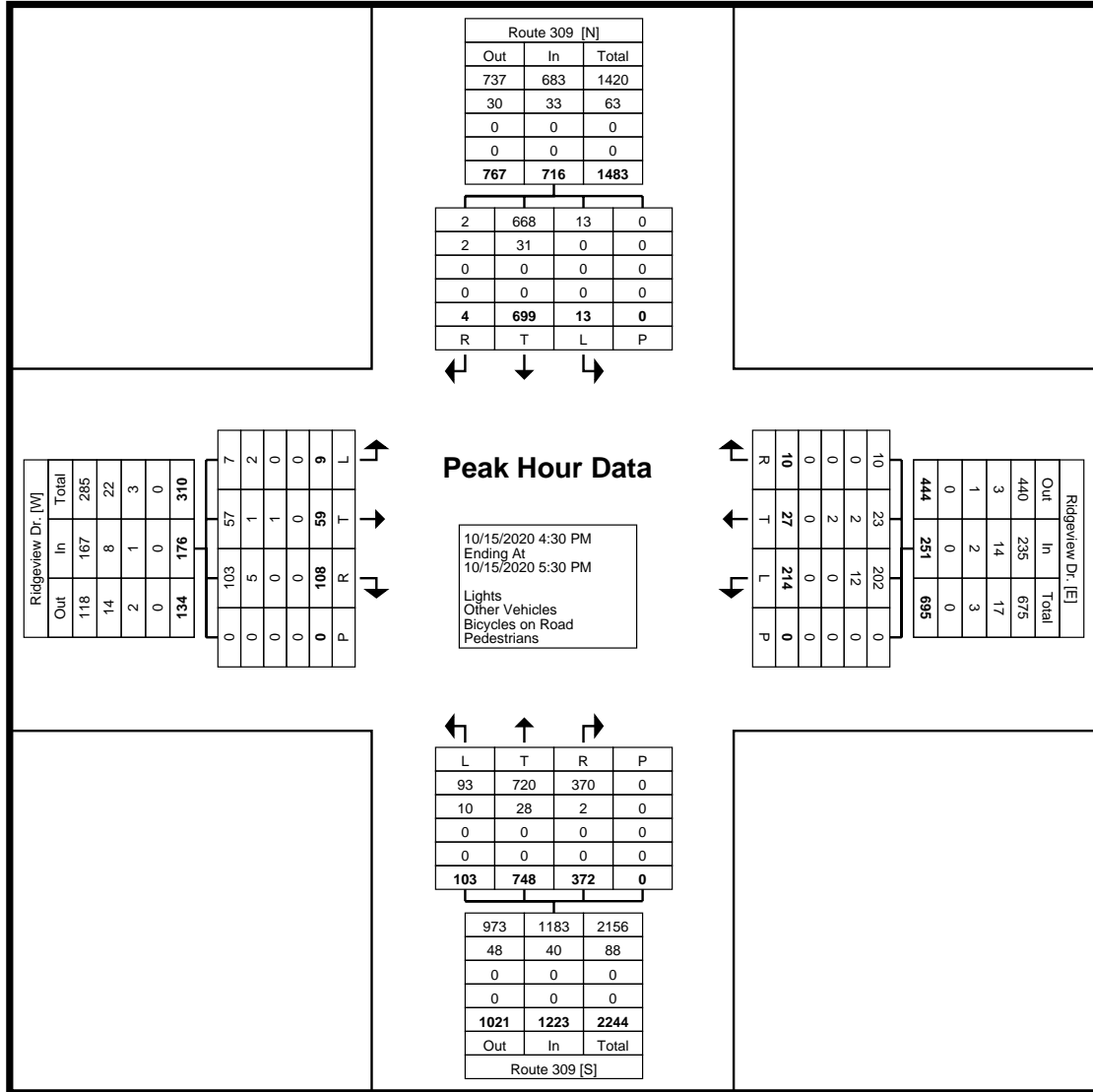
Start Time	Ridgeview Dr. Eastbound						Ridgeview Dr. Westbound						Route 309 Northbound						Route 309 Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
4:30 PM	0	17	15	14	0	46	42	12	2	1	0	57	15	191	83	6	0	295	5	167	1	0	0	173	571
4:45 PM	0	13	9	16	0	38	54	6	0	0	0	60	21	176	65	10	0	272	1	181	0	1	0	183	553
5:00 PM	7	19	22	18	0	66	53	6	5	0	0	64	40	199	103	12	0	354	2	178	0	0	0	180	664
5:15 PM	2	10	6	8	0	26	65	3	2	0	0	70	27	182	86	7	0	302	5	173	2	0	0	180	578
Total	9	59	52	56	0	176	214	27	9	1	0	251	103	748	337	35	0	1223	13	699	3	1	0	716	2366
Approach %	5.1	33.5	29.5	31.8	-	-	85.3	10.8	3.6	0.4	-	-	8.4	61.2	27.6	2.9	-	-	1.8	97.6	0.4	0.1	-	-	-
Total %	0.4	2.5	2.2	2.4	-	7.4	9.0	1.1	0.4	0.0	-	10.6	4.4	31.6	14.2	1.5	-	51.7	0.5	29.5	0.1	0.0	-	30.3	-
PHF	0.321	0.776	0.591	0.778	-	0.667	0.823	0.563	0.450	0.250	-	0.896	0.644	0.940	0.818	0.729	-	0.864	0.650	0.965	0.375	0.250	-	0.978	0.891
Lights	7	57	51	52	-	167	202	23	9	1	-	235	93	720	335	35	-	1183	13	668	2	0	-	683	2268
% Lights	77.8	96.6	98.1	92.9	-	94.9	94.4	85.2	100.0	100.0	-	93.6	90.3	96.3	99.4	100.0	-	96.7	100.0	95.6	66.7	0.0	-	95.4	95.9
Other Vehicles	2	1	1	4	-	8	12	2	0	0	-	14	10	28	2	0	-	40	0	31	1	1	-	33	95
% Other Vehicles	22.2	1.7	1.9	7.1	-	4.5	5.6	7.4	0.0	0.0	-	5.6	9.7	3.7	0.6	0.0	-	3.3	0.0	4.4	33.3	100.0	-	4.6	4.0
Bicycles on Road	0	1	0	0	-	1	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	3
% Bicycles on Road	0.0	1.7	0.0	0.0	-	0.6	0.0	7.4	0.0	0.0	-	0.8	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Route 309 &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 6



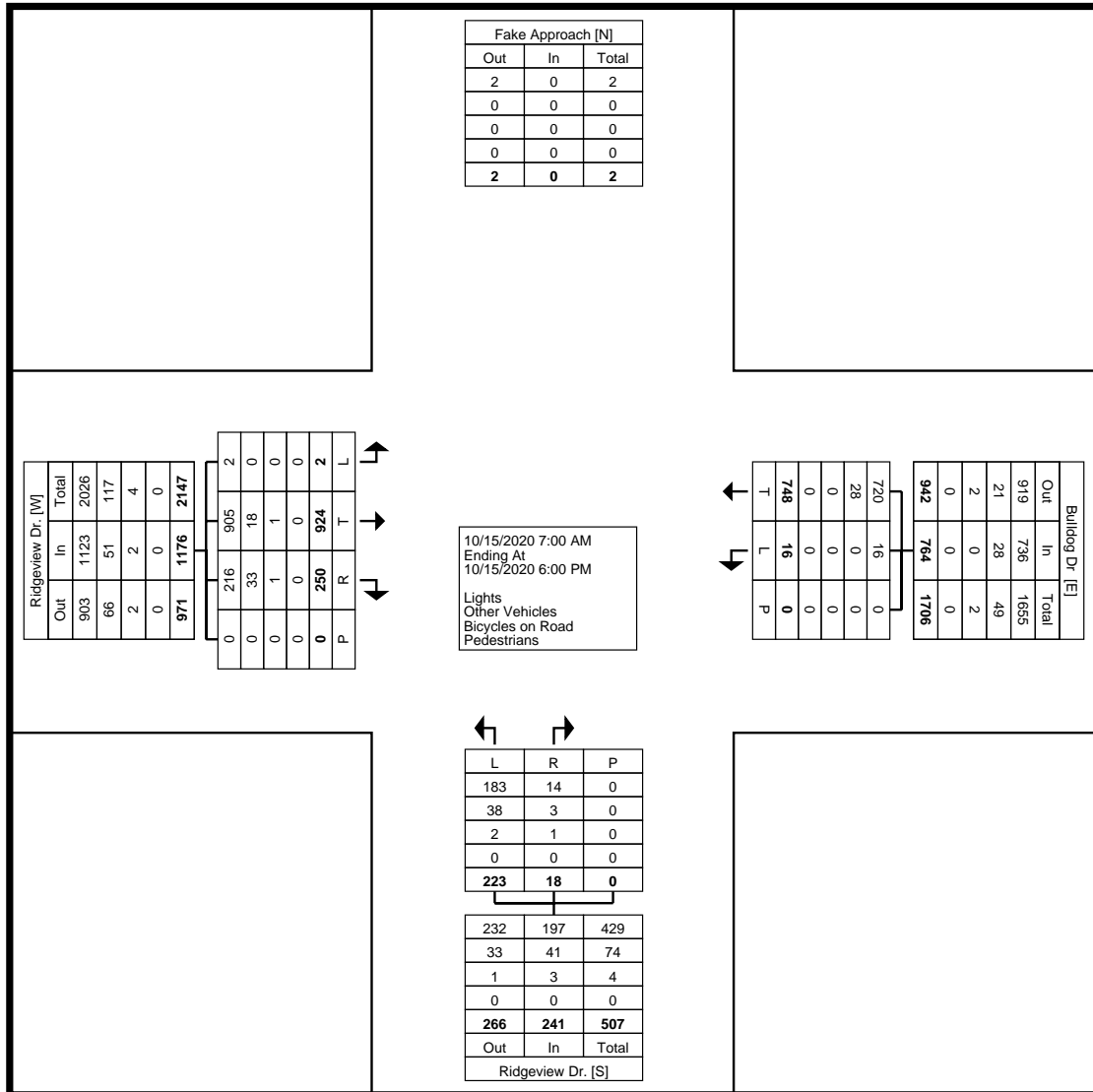
Turning Movement Peak Hour Data Plot (4:30 PM)



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Counted By: Mio
 Set Up By: JH:
 Weather: Clear:

Count Name: Bulldog Dr &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 2



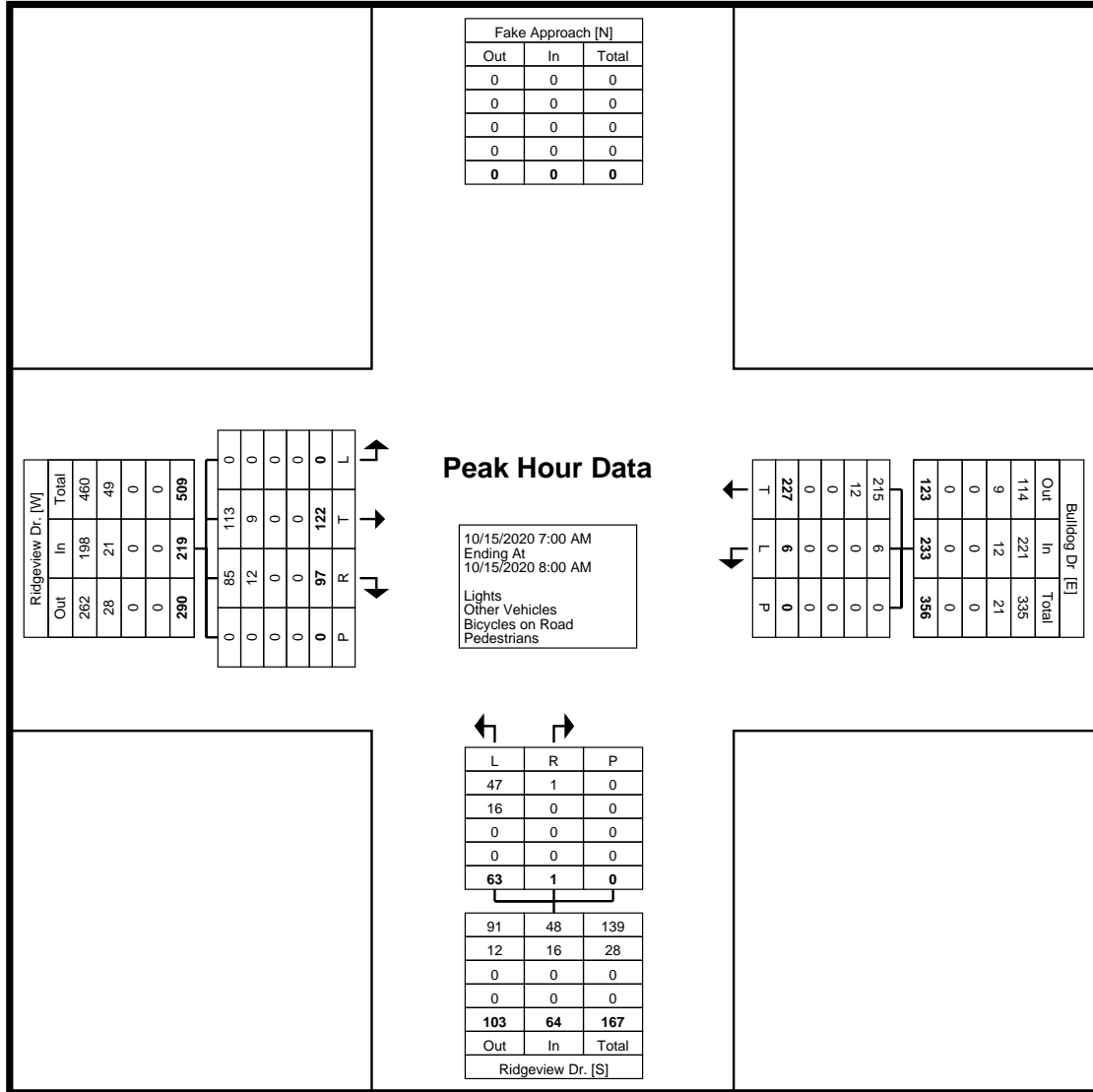
Turning Movement Data Plot



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Counted By: Mio
 Set Up By: JH:
 Weather: Clear

Count Name: Bulldog Dr &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 4



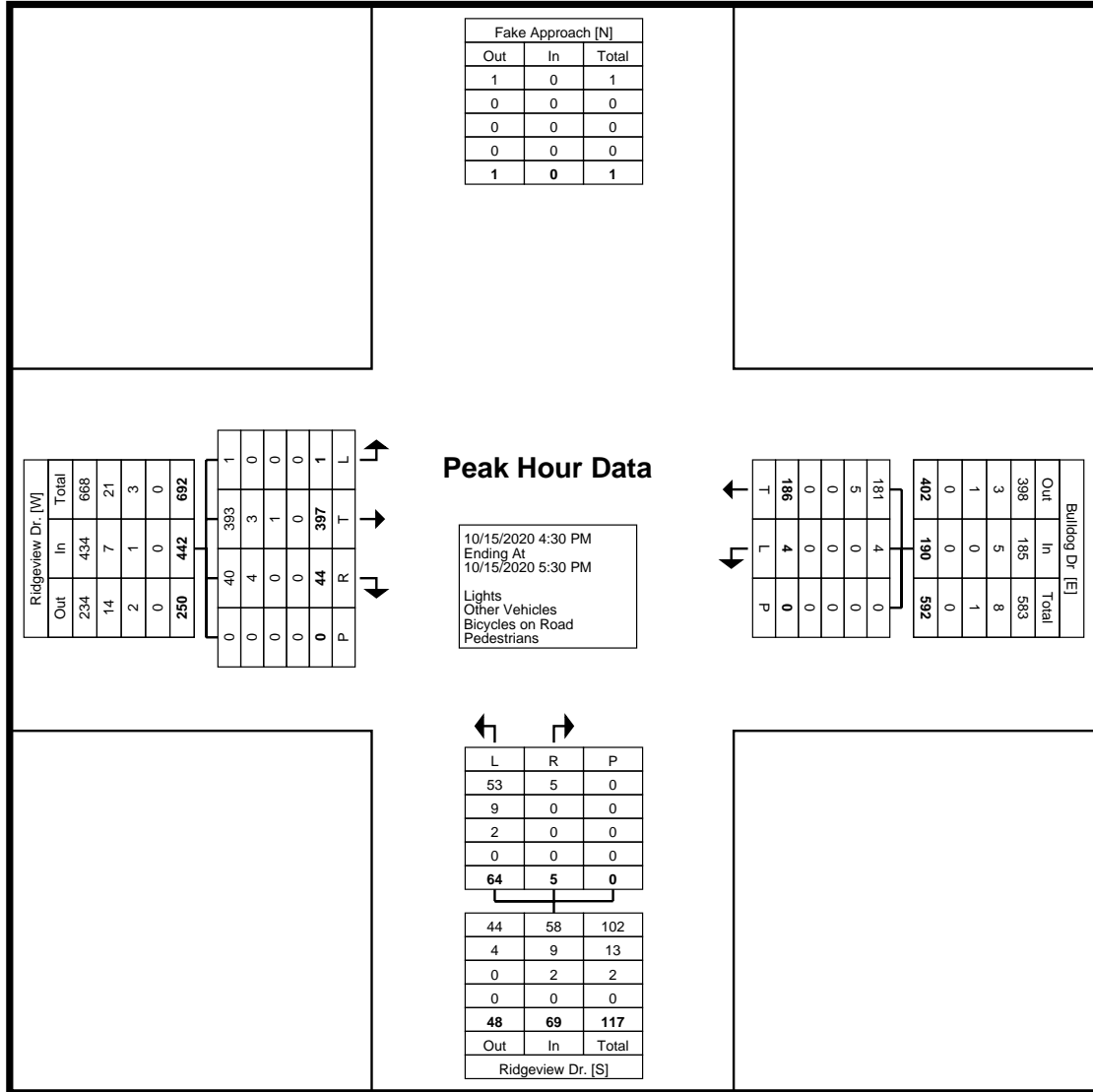
Turning Movement Peak Hour Data Plot (7:00 AM)



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Counted By: Mio
 Set Up By: JH:
 Weather: Clear

Count Name: Bulldog Dr &
 Ridgeview Dr.
 Site Code:
 Start Date: 10/15/2020
 Page No: 6



Turning Movement Peak Hour Data Plot (4:30 PM)



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Counted By: Mio:
Set Up By: JH:
Weather:Clear:

Count Name: Bulldog Dr &
Ridgeview Dr.
Site Code:
Start Date: 10/15/2020
Page No: 7



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Ridgeview Dr. &
 Walbert Ave
 Site Code:
 Start Date: 10/15/2020
 Page No: 1

Turning Movement Data

Start Time	Walbert Ave Eastbound						Walbert Ave Westbound						Ridgeview Dr. Northbound						Ridgeview Dr. Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:00 AM	1	17	2	0	0	20	23	16	1	0	0	40	0	6	6	16	0	28	2	6	1	0	0	9	97
7:15 AM	5	27	1	1	1	34	30	34	1	0	0	65	3	5	9	9	0	26	1	14	0	0	0	15	140
7:30 AM	2	27	3	0	0	32	37	29	0	0	0	66	3	3	9	13	0	28	2	21	5	0	0	28	154
7:45 AM	0	30	3	0	0	33	35	29	2	0	0	66	2	5	9	19	0	35	5	17	3	0	0	25	159
Hourly Total	8	101	9	1	1	119	125	108	4	0	0	237	8	19	33	57	0	117	10	58	9	0	0	77	550
8:00 AM	2	37	1	0	0	40	32	27	2	0	0	61	4	2	3	15	0	24	3	12	1	0	0	16	141
8:15 AM	0	31	1	0	0	32	31	29	2	0	0	62	2	5	9	19	0	35	0	11	0	0	0	11	140
8:30 AM	3	29	1	1	0	34	29	33	1	1	0	64	1	3	8	21	0	33	0	5	1	0	0	6	137
8:45 AM	2	37	2	0	0	41	30	14	2	0	0	46	3	4	5	16	0	28	1	6	3	0	0	10	125
Hourly Total	7	134	5	1	0	147	122	103	7	1	0	233	10	14	25	71	0	120	4	34	5	0	0	43	543
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	4	35	2	3	0	44	33	47	9	4	0	93	2	23	31	17	0	73	3	7	0	0	0	10	220
4:15 PM	2	43	2	0	0	47	32	37	4	3	0	76	2	19	24	23	0	68	3	9	0	0	0	12	203
4:30 PM	0	51	1	1	0	53	29	45	3	1	0	78	1	27	50	17	0	95	0	1	0	0	0	1	227
4:45 PM	0	38	1	1	0	40	40	39	5	0	0	84	0	31	26	21	0	78	4	0	3	0	0	7	209
Hourly Total	6	167	6	5	0	184	134	168	21	8	0	331	5	100	131	78	0	314	10	17	3	0	0	30	859
5:00 PM	2	30	2	1	0	35	32	51	4	0	0	87	1	29	43	23	0	96	2	5	1	0	0	8	226
5:15 PM	2	54	2	1	0	59	38	38	7	3	0	86	3	42	32	24	0	101	4	9	0	0	0	13	259
5:30 PM	1	37	0	0	0	38	33	32	4	0	0	69	2	23	23	28	0	76	1	6	1	0	0	8	191
5:45 PM	3	33	0	0	0	36	23	30	3	1	1	57	0	12	16	12	1	40	2	5	1	1	0	9	142
Hourly Total	8	154	4	2	0	168	126	151	18	4	1	299	6	106	114	87	1	313	9	25	3	1	0	38	818
Grand Total	29	556	24	9	1	618	507	530	50	13	1	1100	29	239	303	293	1	864	33	134	20	1	0	188	2770
Approach %	4.7	90.0	3.9	1.5	-	-	46.1	48.2	4.5	1.2	-	-	3.4	27.7	35.1	33.9	-	-	17.6	71.3	10.6	0.5	-	-	-
Total %	1.0	20.1	0.9	0.3	-	22.3	18.3	19.1	1.8	0.5	-	39.7	1.0	8.6	10.9	10.6	-	31.2	1.2	4.8	0.7	0.0	-	6.8	-
Lights	25	525	22	9	-	581	493	497	47	12	-	1049	25	237	295	284	-	841	29	132	19	1	-	181	2652
% Lights	86.2	94.4	91.7	100.0	-	94.0	97.2	93.8	94.0	92.3	-	95.4	86.2	99.2	97.4	96.9	-	97.3	87.9	98.5	95.0	100.0	-	96.3	95.7
Other Vehicles	3	31	2	0	-	36	14	33	3	0	-	50	4	2	8	9	-	23	4	1	1	0	-	6	115
% Other Vehicles	10.3	5.6	8.3	0.0	-	5.8	2.8	6.2	6.0	0.0	-	4.5	13.8	0.8	2.6	3.1	-	2.7	12.1	0.7	5.0	0.0	-	3.2	4.2
Bicycles on Road	1	0	0	0	-	1	0	0	0	1	-	1	0	0	0	0	-	0	0	1	0	0	-	1	3
% Bicycles on Road	3.4	0.0	0.0	0.0	-	0.2	0.0	0.0	0.0	7.7	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	0.7	0.0	0.0	-	0.5	0.1
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Ridgeview Dr. &
 Walbert Ave
 Site Code:
 Start Date: 10/15/2020
 Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

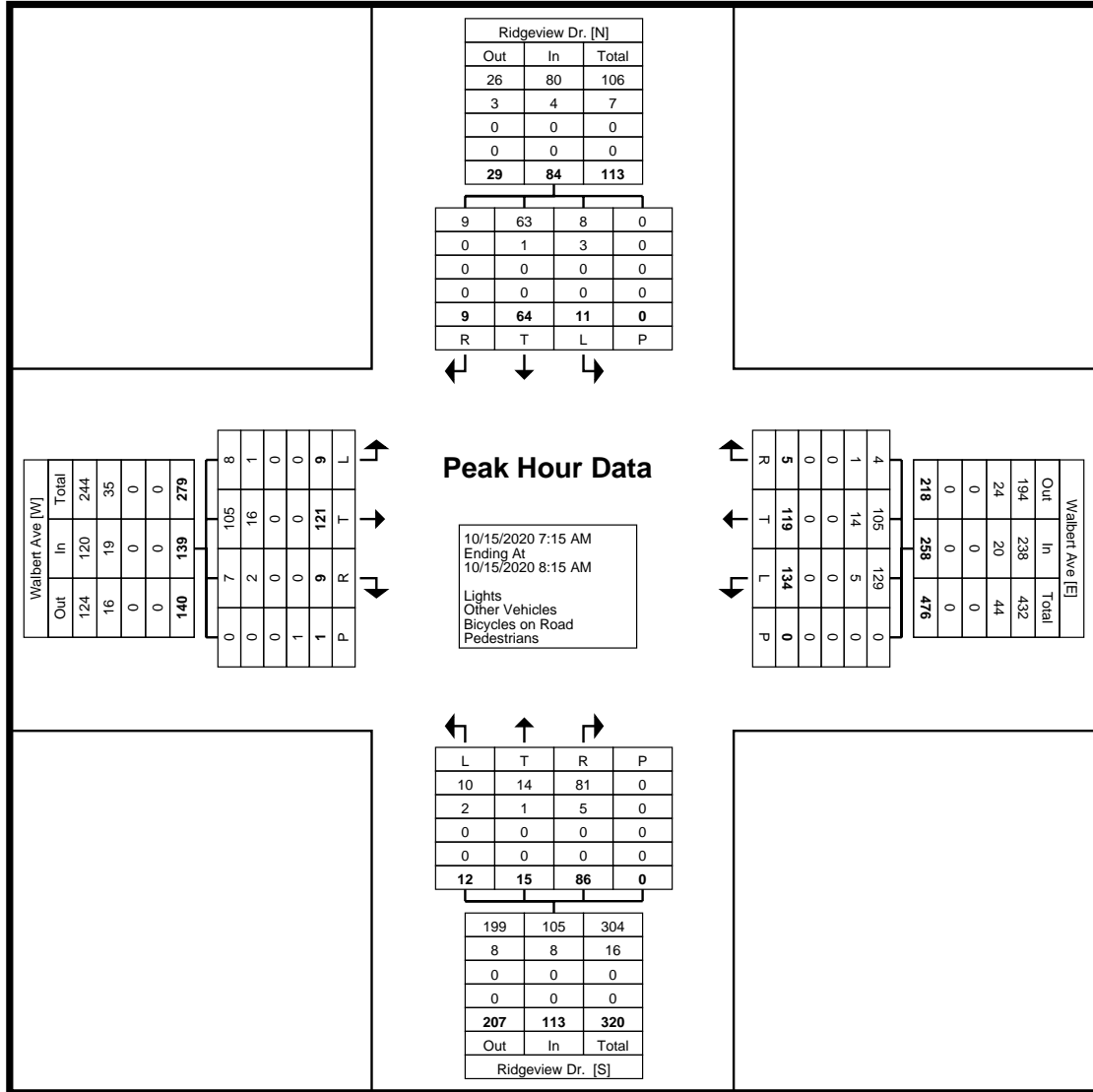
Start Time	Walbert Ave Eastbound						Walbert Ave Westbound						Ridgeview Dr. Northbound						Ridgeview Dr. Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
7:15 AM	5	27	1	1	1	34	30	34	1	0	0	65	3	5	9	9	0	26	1	14	0	0	0	15	140
7:30 AM	2	27	3	0	0	32	37	29	0	0	0	66	3	3	9	13	0	28	2	21	5	0	0	28	154
7:45 AM	0	30	3	0	0	33	35	29	2	0	0	66	2	5	9	19	0	35	5	17	3	0	0	25	159
8:00 AM	2	37	1	0	0	40	32	27	2	0	0	61	4	2	3	15	0	24	3	12	1	0	0	16	141
Total	9	121	8	1	1	139	134	119	5	0	0	258	12	15	30	56	0	113	11	64	9	0	0	84	594
Approach %	6.5	87.1	5.8	0.7	-	-	51.9	46.1	1.9	0.0	-	-	10.6	13.3	26.5	49.6	-	-	13.1	76.2	10.7	0.0	-	-	-
Total %	1.5	20.4	1.3	0.2	-	23.4	22.6	20.0	0.8	0.0	-	43.4	2.0	2.5	5.1	9.4	-	19.0	1.9	10.8	1.5	0.0	-	14.1	-
PHF	0.450	0.818	0.667	0.250	-	0.869	0.905	0.875	0.625	0.000	-	0.977	0.750	0.750	0.833	0.737	-	0.807	0.550	0.762	0.450	0.000	-	0.750	0.934
Lights	8	105	6	1	-	120	129	105	4	0	-	238	10	14	28	53	-	105	8	63	9	0	-	80	543
% Lights	88.9	86.8	75.0	100.0	-	86.3	96.3	88.2	80.0	-	-	92.2	83.3	93.3	93.3	94.6	-	92.9	72.7	98.4	100.0	-	-	95.2	91.4
Other Vehicles	1	16	2	0	-	19	5	14	1	0	-	20	2	1	2	3	-	8	3	1	0	0	-	4	51
% Other Vehicles	11.1	13.2	25.0	0.0	-	13.7	3.7	11.8	20.0	-	-	7.8	16.7	6.7	6.7	5.4	-	7.1	27.3	1.6	0.0	-	-	4.8	8.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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 Weather: Clear:

Count Name: Ridgeview Dr. &
 Walbert Ave
 Site Code:
 Start Date: 10/15/2020
 Page No: 4



Turning Movement Peak Hour Data Plot (7:15 AM)



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 Weather: Clear:

Count Name: Ridgeview Dr. &
 Walbert Ave
 Site Code:
 Start Date: 10/15/2020
 Page No: 5

Turning Movement Peak Hour Data (4:30 PM)

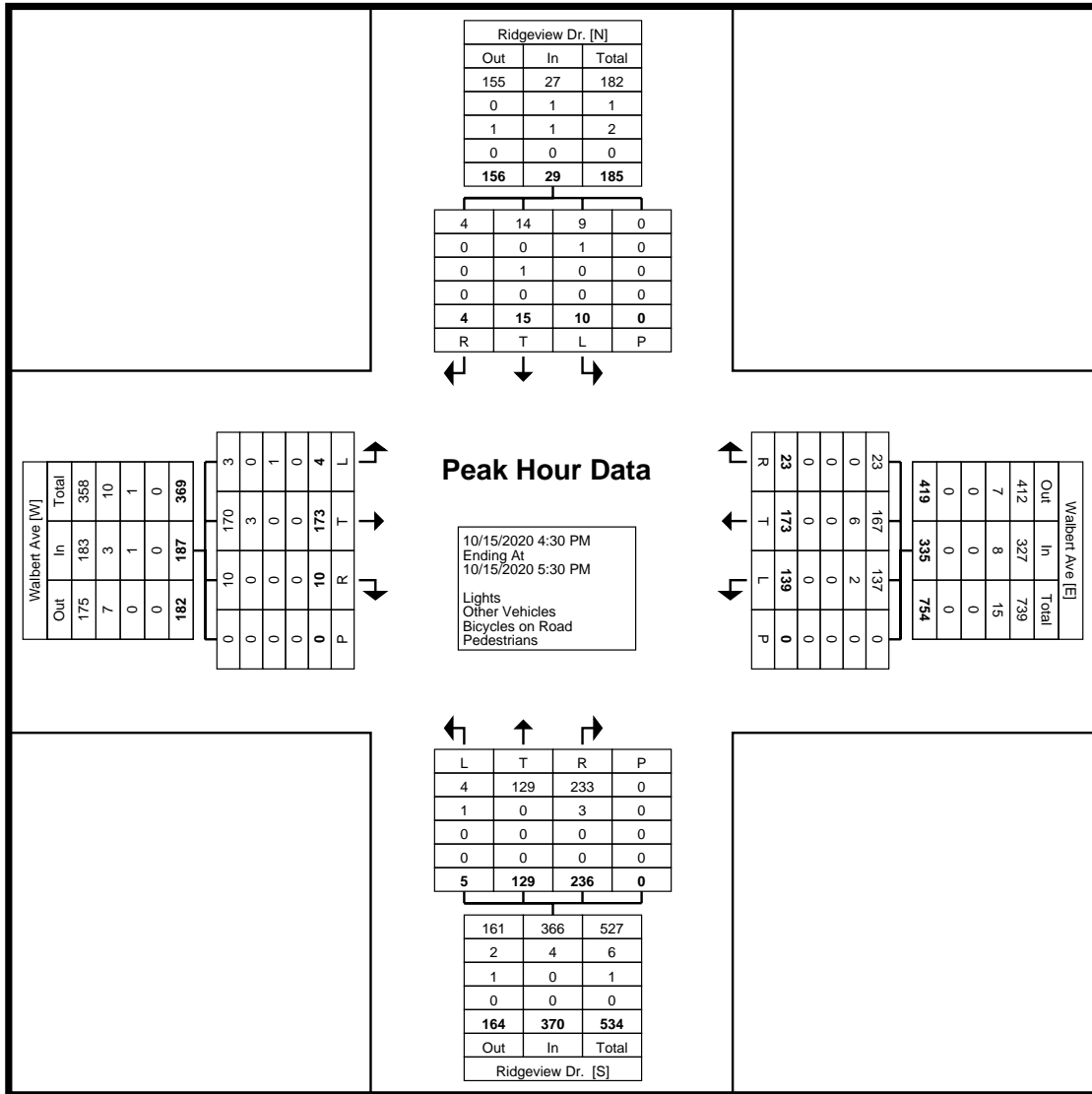
Start Time	Walbert Ave Eastbound						Walbert Ave Westbound						Ridgeview Dr. Northbound						Ridgeview Dr. Southbound						Int. Total
	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	Left	Thru	Right	Right on Red	Peds	App. Total	
4:30 PM	0	51	1	1	0	53	29	45	3	1	0	78	1	27	50	17	0	95	0	1	0	0	0	1	227
4:45 PM	0	38	1	1	0	40	40	39	5	0	0	84	0	31	26	21	0	78	4	0	3	0	0	7	209
5:00 PM	2	30	2	1	0	35	32	51	4	0	0	87	1	29	43	23	0	96	2	5	1	0	0	8	226
5:15 PM	2	54	2	1	0	59	38	38	7	3	0	86	3	42	32	24	0	101	4	9	0	0	0	13	259
Total	4	173	6	4	0	187	139	173	19	4	0	335	5	129	151	85	0	370	10	15	4	0	0	29	921
Approach %	2.1	92.5	3.2	2.1	-	-	41.5	51.6	5.7	1.2	-	-	1.4	34.9	40.8	23.0	-	-	34.5	51.7	13.8	0.0	-	-	-
Total %	0.4	18.8	0.7	0.4	-	20.3	15.1	18.8	2.1	0.4	-	36.4	0.5	14.0	16.4	9.2	-	40.2	1.1	1.6	0.4	0.0	-	3.1	-
PHF	0.500	0.801	0.750	1.000	-	0.792	0.869	0.848	0.679	0.333	-	0.963	0.417	0.768	0.755	0.885	-	0.916	0.625	0.417	0.333	0.000	-	0.558	0.889
Lights	3	170	6	4	-	183	137	167	19	4	-	327	4	129	148	85	-	366	9	14	4	0	-	27	903
% Lights	75.0	98.3	100.0	100.0	-	97.9	98.6	96.5	100.0	100.0	-	97.6	80.0	100.0	98.0	100.0	-	98.9	90.0	93.3	100.0	-	-	93.1	98.0
Other Vehicles	0	3	0	0	-	3	2	6	0	0	-	8	1	0	3	0	-	4	1	0	0	0	-	1	16
% Other Vehicles	0.0	1.7	0.0	0.0	-	1.6	1.4	3.5	0.0	0.0	-	2.4	20.0	0.0	2.0	0.0	-	1.1	10.0	0.0	0.0	-	-	3.4	1.7
Bicycles on Road	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	2
% Bicycles on Road	25.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	6.7	0.0	-	-	3.4	0.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Ridgeview Dr. &
 Walbert Ave
 Site Code:
 Start Date: 10/15/2020
 Page No: 6



Turning Movement Peak Hour Data Plot (4:30 PM)



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Counted By: Mio:
Set Up By: JH:
Weather: Clear:

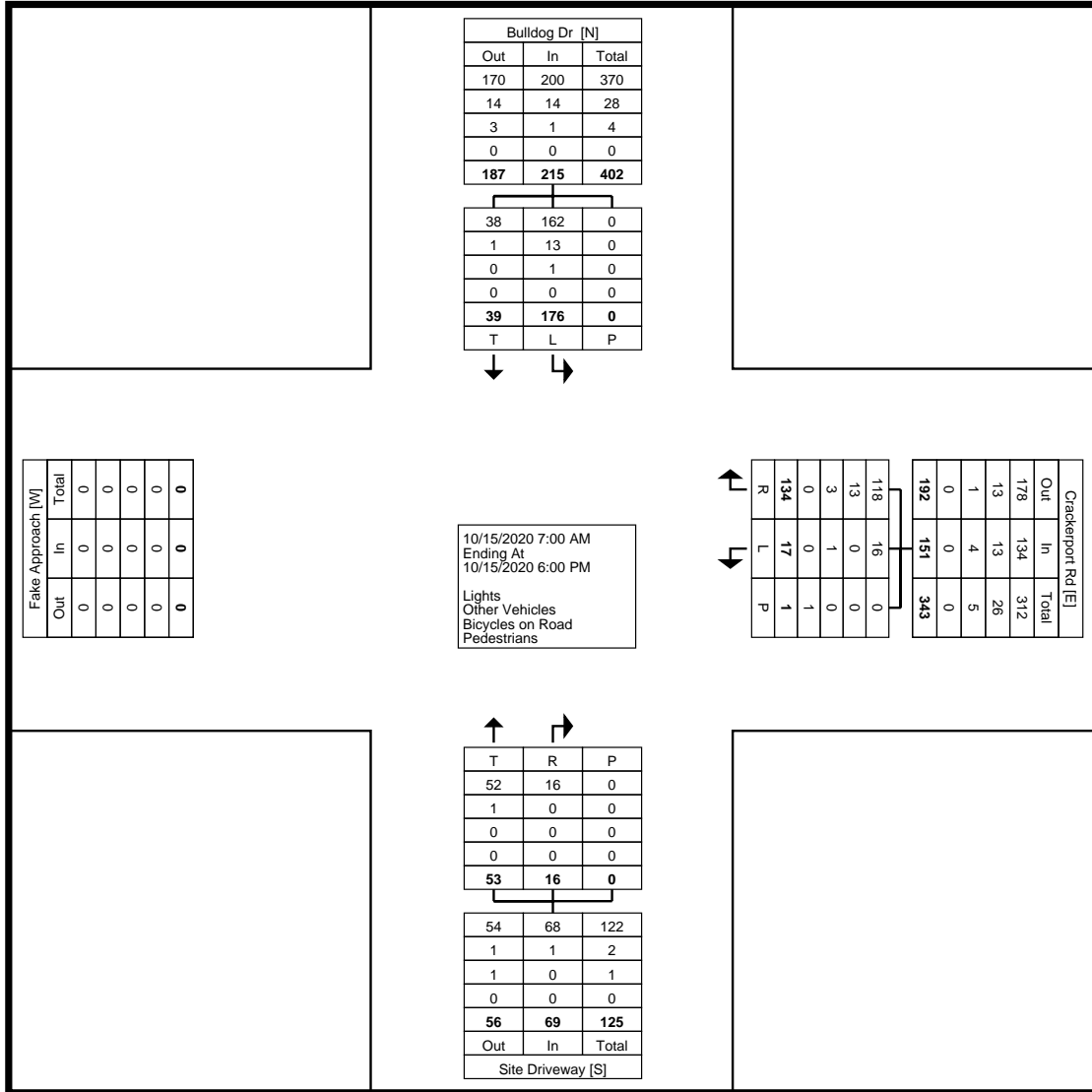
Count Name: Ridgeview Dr. &
Walbert Ave
Site Code:
Start Date: 10/15/2020
Page No: 7



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Bulldog Dr &
 Crackerport Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 2



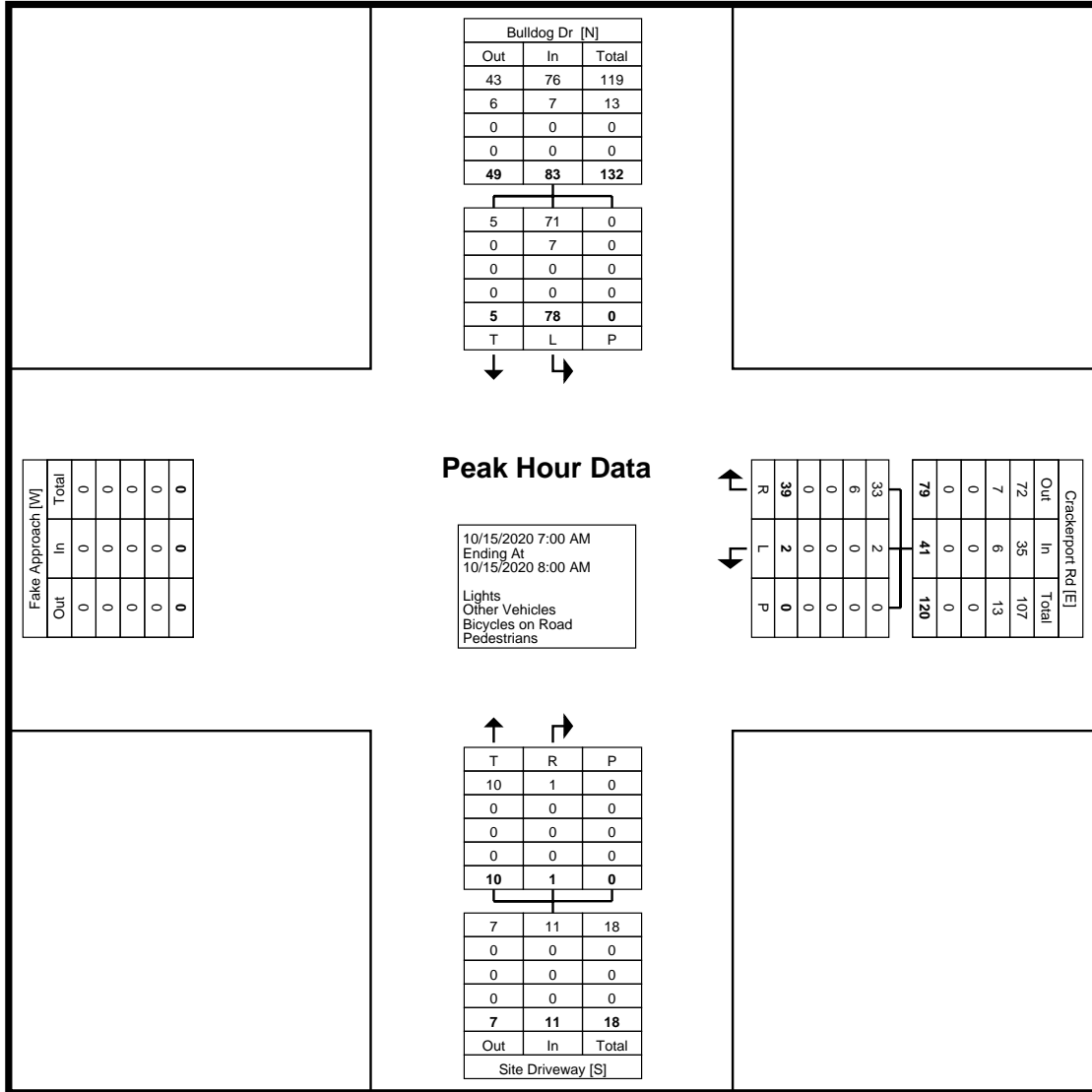
Turning Movement Data Plot



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Bulldog Dr &
 Crackerport Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 4



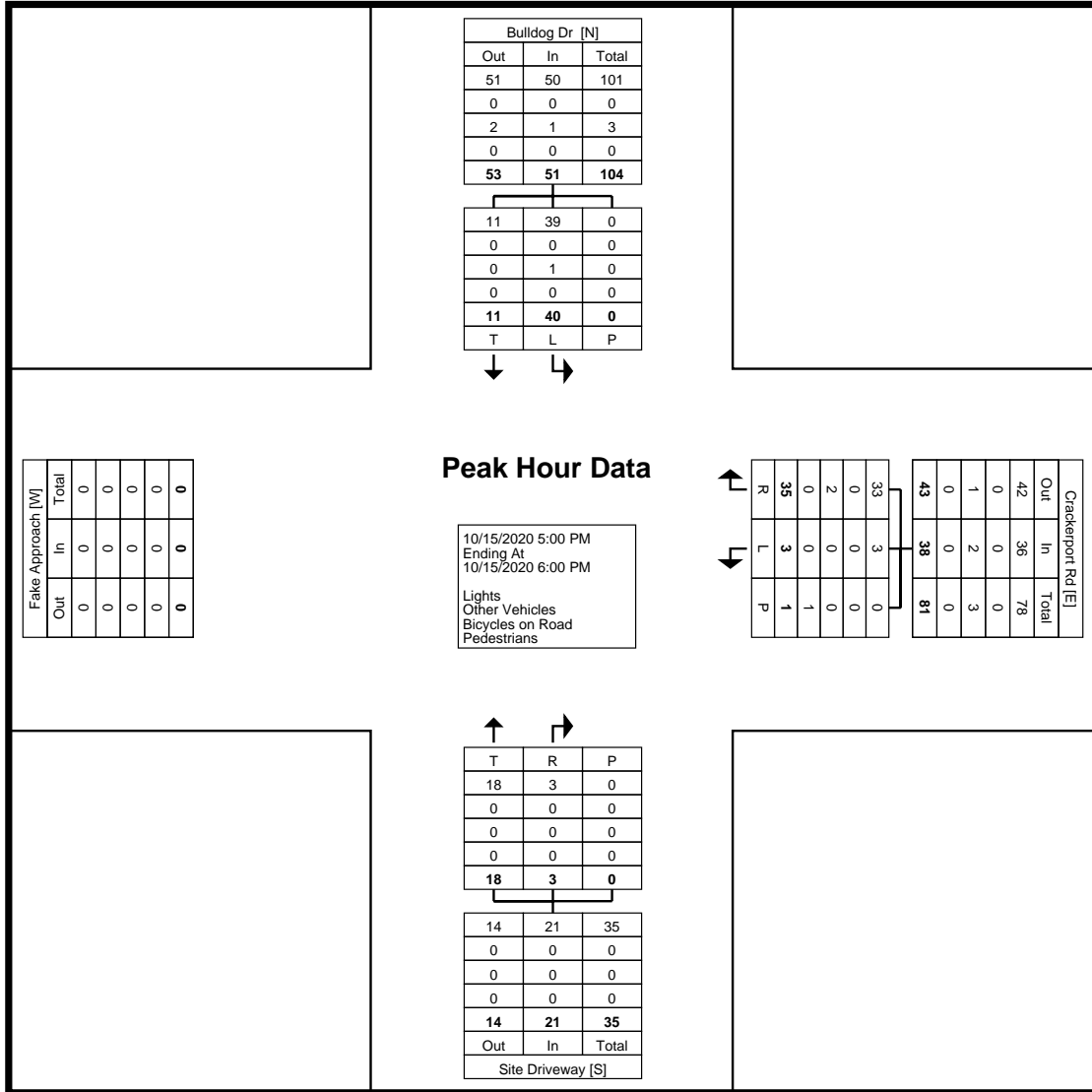
Turning Movement Peak Hour Data Plot (7:00 AM)



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 Weather: Clear:

Count Name: Bulldog Dr &
 Crackerport Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 6



Turning Movement Peak Hour Data Plot (5:00 PM)



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Counted By: Mio:
Set Up By: JH:
Weather:Clear:

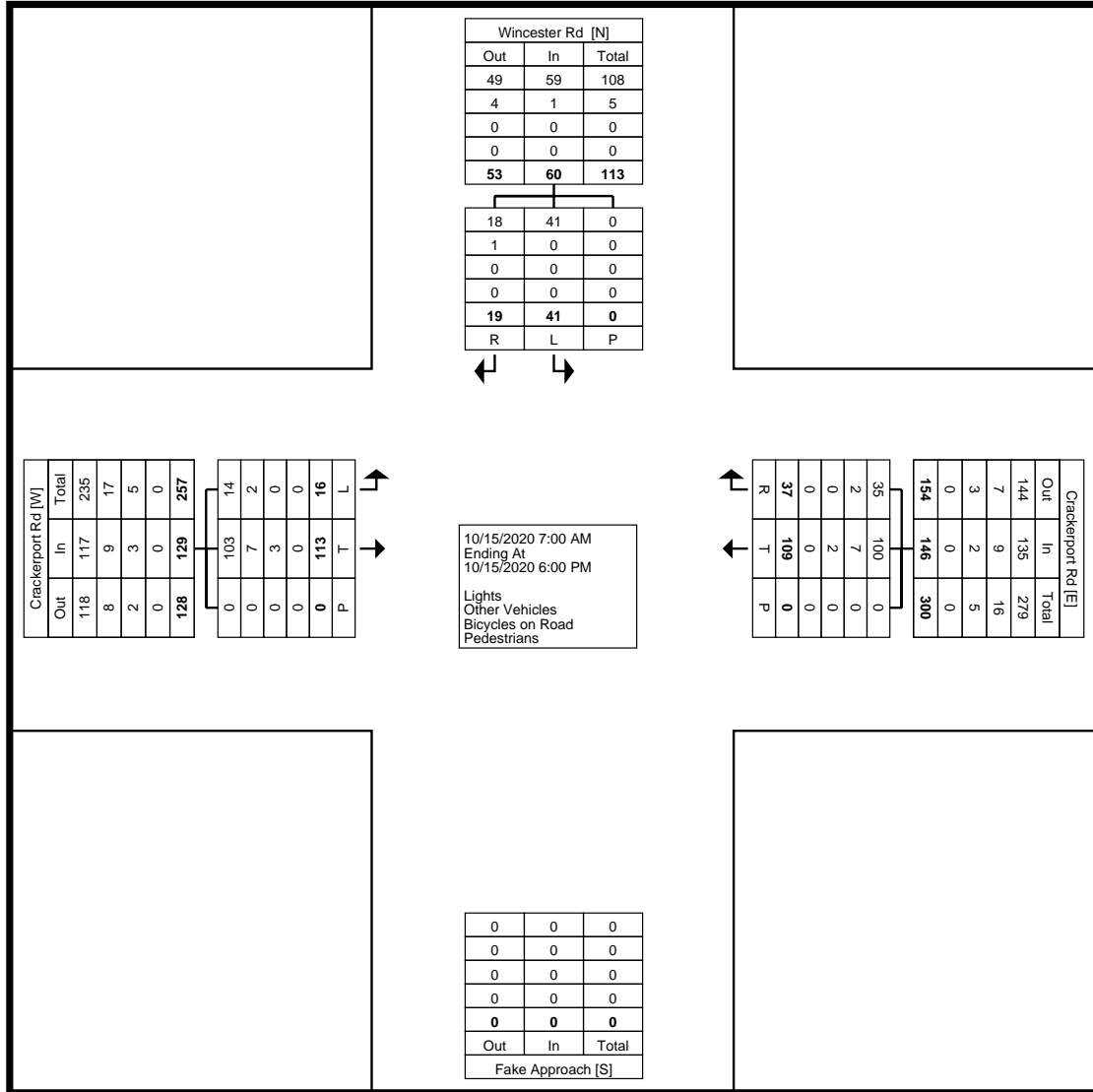
Count Name: Bulldog Dr &
Crackerport Rd
Site Code:
Start Date: 10/15/2020
Page No: 7



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Winchester Rd &
 Crackerport Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 2



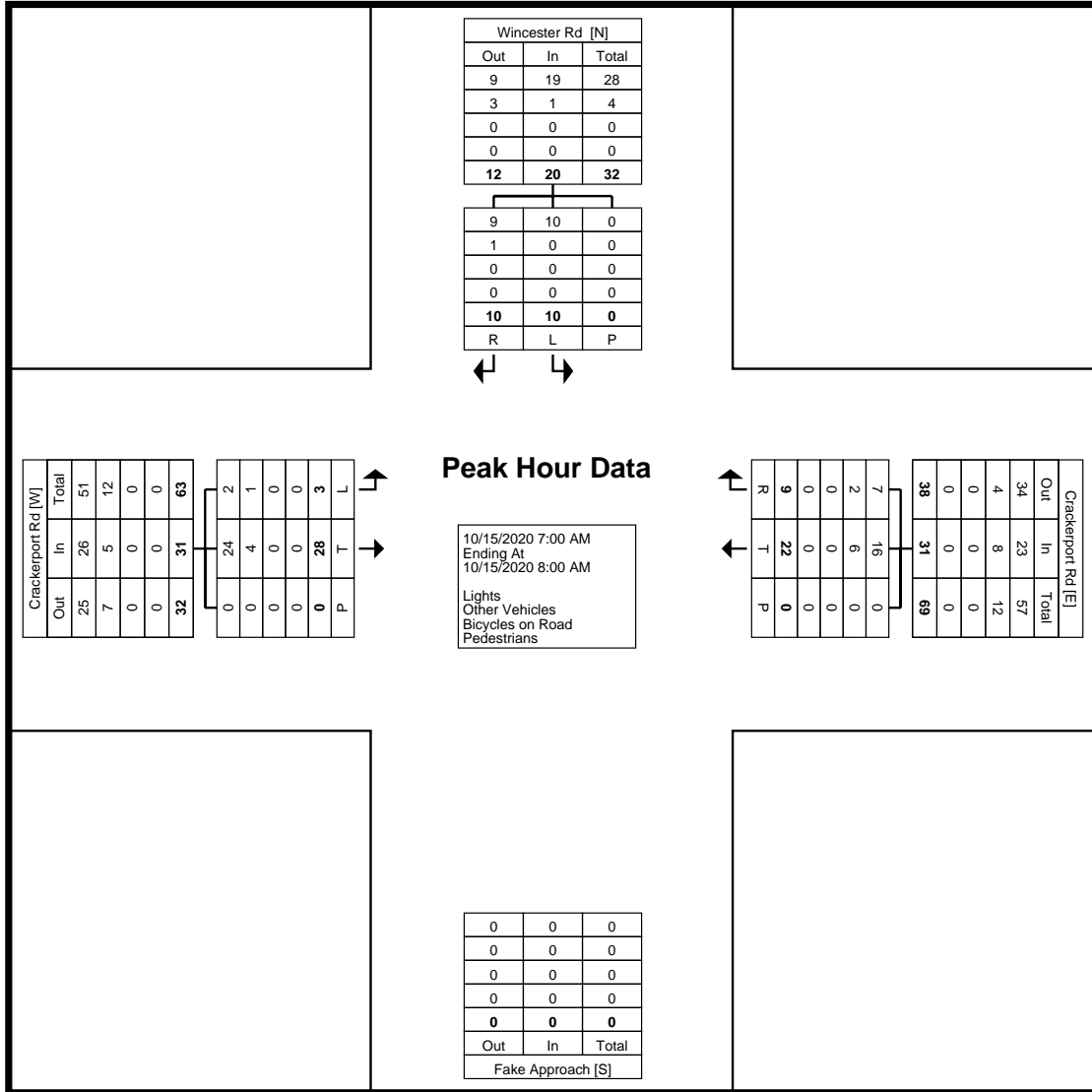
Turning Movement Data Plot



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Winchester Rd &
 Crackerport Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 4



Turning Movement Peak Hour Data Plot (7:00 AM)



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Counted By: Mio:
Set Up By: JH:
Weather: Clear:

Count Name: Winchester Rd &
Crackerport Rd
Site Code:
Start Date: 10/15/2020
Page No: 7



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Count Name: Springhouse Rd &
Crackerport Rd
Site Code:
Start Date: 10/15/2020
Page No: 1

Counted By: Mio:
Set Up By: JH:
Weather: Clear:

Turning Movement Data

Start Time	Crackerport Rd Eastbound				Springhouse Rd Northbound				Springhouse Rd Southbound				Int. Total
	Left	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	
7:00 AM	0	2	0	2	18	65	0	83	41	10	0	51	136
7:15 AM	1	25	0	26	59	58	0	117	66	19	0	85	228
7:30 AM	5	33	0	38	23	39	0	62	76	5	1	81	181
7:45 AM	0	10	0	10	4	69	0	73	61	4	0	65	148
Hourly Total	6	70	0	76	104	231	0	335	244	38	1	282	693
8:00 AM	2	6	0	8	0	38	0	38	65	4	0	69	115
8:15 AM	1	9	0	10	7	63	0	70	54	1	0	55	135
8:30 AM	3	12	0	15	4	47	0	51	45	2	0	47	113
8:45 AM	6	9	0	15	6	74	0	80	70	2	0	72	167
Hourly Total	12	36	0	48	17	222	0	239	234	9	0	243	530
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	4	12	0	16	13	109	0	122	96	8	0	104	242
4:15 PM	1	11	0	12	8	94	0	102	95	5	0	100	214
4:30 PM	4	11	0	15	5	92	0	97	87	4	0	91	203
4:45 PM	1	10	0	11	12	100	0	112	97	2	0	99	222
Hourly Total	10	44	0	54	38	395	0	433	375	19	0	394	881
5:00 PM	3	6	1	9	20	99	0	119	82	3	2	85	213
5:15 PM	3	10	0	13	18	112	0	130	73	3	0	76	219
5:30 PM	5	7	0	12	9	101	0	110	71	8	0	79	201
5:45 PM	2	9	0	11	12	74	0	86	66	2	0	68	165
Hourly Total	13	32	1	45	59	386	0	445	292	16	2	308	798
Grand Total	41	182	1	223	218	1234	0	1452	1145	82	3	1227	2902
Approach %	18.4	81.6	-	-	15.0	85.0	-	-	93.3	6.7	-	-	-
Total %	1.4	6.3	-	7.7	7.5	42.5	-	50.0	39.5	2.8	-	42.3	-
Lights	38	168	-	206	193	1195	-	1388	1120	77	-	1197	2791
% Lights	92.7	92.3	-	92.4	88.5	96.8	-	95.6	97.8	93.9	-	97.6	96.2
Other Vehicles	3	14	-	17	23	34	-	57	23	4	-	27	101
% Other Vehicles	7.3	7.7	-	7.6	10.6	2.8	-	3.9	2.0	4.9	-	2.2	3.5
Bicycles on Road	0	0	-	0	2	5	-	7	2	1	-	3	10
% Bicycles on Road	0.0	0.0	-	0.0	0.9	0.4	-	0.5	0.2	1.2	-	0.2	0.3
Pedestrians	-	-	1	-	-	-	0	-	-	-	3	-	-
% Pedestrians	-	-	100.0	-	-	-	-	-	-	-	100.0	-	-



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Count Name: Springhouse Rd &
Crackerport Rd
Site Code:
Start Date: 10/15/2020
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Turning Movement Peak Hour Data (7:00 AM)

Start Time	Crackerport Rd Eastbound				Springhouse Rd Northbound				Springhouse Rd Southbound				Int. Total
	Left	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Thru	Right	Peds	App. Total	
7:00 AM	0	2	0	2	18	65	0	83	41	10	0	51	136
7:15 AM	1	25	0	26	59	58	0	117	66	19	0	85	228
7:30 AM	5	33	0	38	23	39	0	62	76	5	1	81	181
7:45 AM	0	10	0	10	4	69	0	73	61	4	0	65	148
Total	6	70	0	76	104	231	0	335	244	38	1	282	693
Approach %	7.9	92.1	-	-	31.0	69.0	-	-	86.5	13.5	-	-	-
Total %	0.9	10.1	-	11.0	15.0	33.3	-	48.3	35.2	5.5	-	40.7	-
PHF	0.300	0.530	-	0.500	0.441	0.837	-	0.716	0.803	0.500	-	0.829	0.760
Lights	4	66	-	70	81	207	-	288	232	37	-	269	627
% Lights	66.7	94.3	-	92.1	77.9	89.6	-	86.0	95.1	97.4	-	95.4	90.5
Other Vehicles	2	4	-	6	23	24	-	47	11	1	-	12	65
% Other Vehicles	33.3	5.7	-	7.9	22.1	10.4	-	14.0	4.5	2.6	-	4.3	9.4
Bicycles on Road	0	0	-	0	0	0	-	0	1	0	-	1	1
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.4	0.0	-	0.4	0.1
Pedestrians	-	-	0	-	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Traffic Planning and Design, Inc
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Suite 650
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Counted By: Mio:
Set Up By: JH:
Weather: Clear:

Count Name: Springhouse Rd &
Crackerport Rd
Site Code:
Start Date: 10/15/2020
Page No: 7



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Springhouse Rd &
 Winchester Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 1

Turning Movement Data

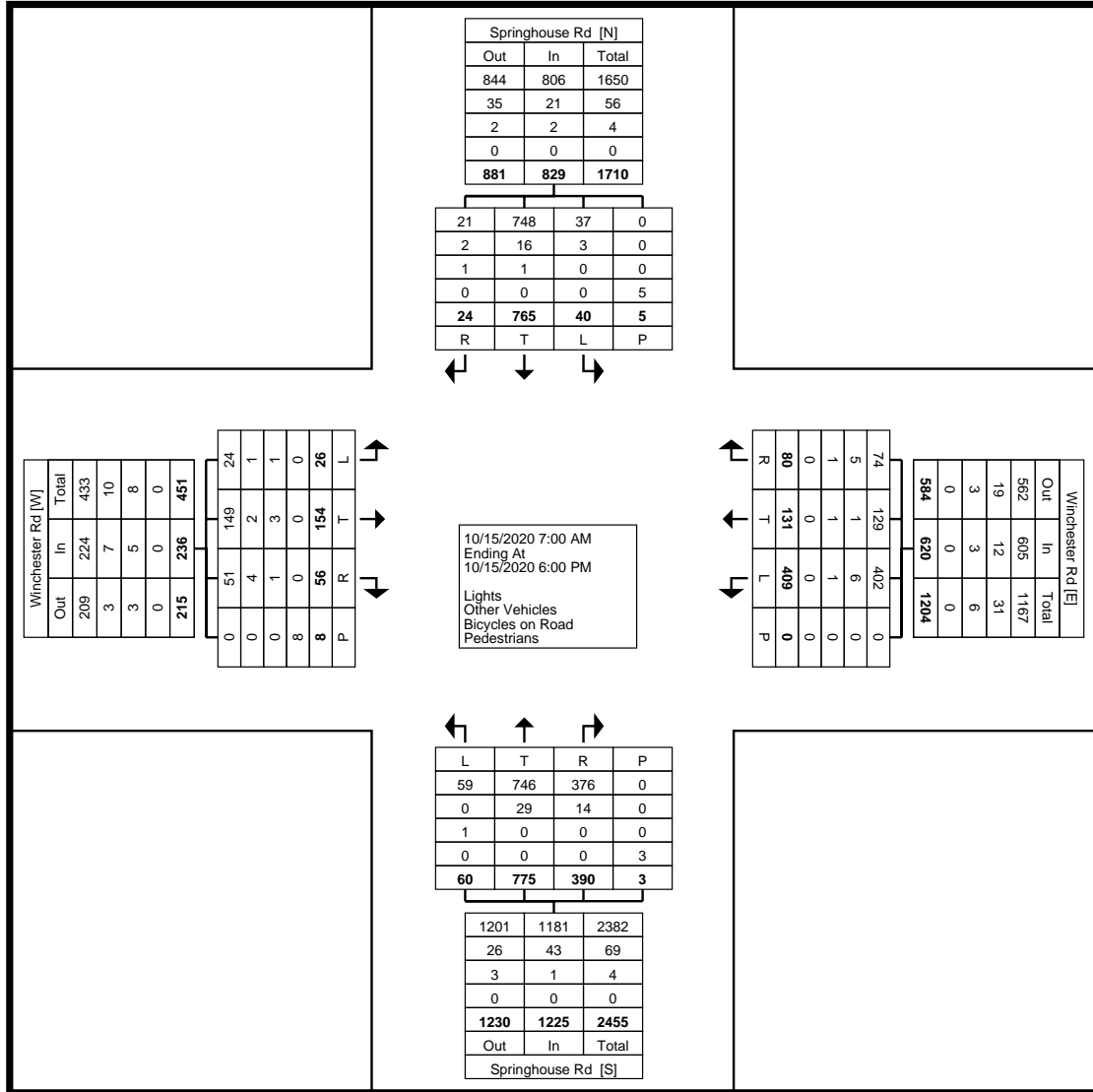
Start Time	Winchester Rd Eastbound					Winchester Rd Westbound					Springhouse Rd Northbound					Springhouse Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	12	3	0	15	13	2	0	0	15	1	43	16	0	60	1	40	1	0	42	132
7:15 AM	3	11	7	0	21	13	3	2	0	18	2	41	17	0	60	3	69	2	0	74	173
7:30 AM	1	13	2	1	16	14	4	0	0	18	2	21	25	1	48	2	68	2	1	72	154
7:45 AM	2	14	4	0	20	18	5	5	0	28	4	26	33	0	63	3	47	0	0	50	161
Hourly Total	6	50	16	1	72	58	14	7	0	79	9	131	91	1	231	9	224	5	1	238	620
8:00 AM	4	5	1	0	10	16	8	2	0	26	1	18	21	0	40	2	56	1	1	59	135
8:15 AM	2	7	7	0	16	11	4	3	0	18	2	30	23	0	55	0	34	1	1	35	124
8:30 AM	3	8	3	0	14	12	2	2	0	16	3	38	14	0	55	5	29	1	0	35	120
8:45 AM	0	11	5	0	16	17	5	3	0	25	3	44	35	0	82	5	43	2	1	50	173
Hourly Total	9	31	16	0	56	56	19	10	0	85	9	130	93	0	232	12	162	5	3	179	552
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	5	2	1	7	37	13	11	0	61	3	77	26	0	106	1	58	2	0	61	235
4:15 PM	2	11	3	1	16	41	15	11	0	67	6	71	27	0	104	4	47	2	0	53	240
4:30 PM	2	13	2	4	17	40	13	10	0	63	9	64	23	0	96	2	43	1	0	46	222
4:45 PM	1	5	2	1	8	44	12	6	0	62	7	58	28	0	93	4	48	1	0	53	216
Hourly Total	5	34	9	7	48	162	53	38	0	253	25	270	104	0	399	11	196	6	0	213	913
5:00 PM	3	8	2	0	13	35	12	3	0	50	4	74	27	0	105	2	50	2	0	54	222
5:15 PM	2	13	5	0	20	32	13	9	0	54	6	61	28	0	95	2	47	4	1	53	222
5:30 PM	1	11	4	0	16	36	10	7	0	53	2	62	20	2	84	2	41	0	0	43	196
5:45 PM	0	7	4	0	11	30	10	6	0	46	5	47	27	0	79	2	45	2	0	49	185
Hourly Total	6	39	15	0	60	133	45	25	0	203	17	244	102	2	363	8	183	8	1	199	825
Grand Total	26	154	56	8	236	409	131	80	0	620	60	775	390	3	1225	40	765	24	5	829	2910
Approach %	11.0	65.3	23.7	-	-	66.0	21.1	12.9	-	-	4.9	63.3	31.8	-	-	4.8	92.3	2.9	-	-	-
Total %	0.9	5.3	1.9	-	8.1	14.1	4.5	2.7	-	21.3	2.1	26.6	13.4	-	42.1	1.4	26.3	0.8	-	28.5	-
Lights	24	149	51	-	224	402	129	74	-	605	59	746	376	-	1181	37	748	21	-	806	2816
% Lights	92.3	96.8	91.1	-	94.9	98.3	98.5	92.5	-	97.6	98.3	96.3	96.4	-	96.4	92.5	97.8	87.5	-	97.2	96.8
Other Vehicles	1	2	4	-	7	6	1	5	-	12	0	29	14	-	43	3	16	2	-	21	83
% Other Vehicles	3.8	1.3	7.1	-	3.0	1.5	0.8	6.3	-	1.9	0.0	3.7	3.6	-	3.5	7.5	2.1	8.3	-	2.5	2.9
Bicycles on Road	1	3	1	-	5	1	1	1	-	3	1	0	0	-	1	0	1	1	-	2	11
% Bicycles on Road	3.8	1.9	1.8	-	2.1	0.2	0.8	1.3	-	0.5	1.7	0.0	0.0	-	0.1	0.0	0.1	4.2	-	0.2	0.4
Pedestrians	-	-	-	8	-	-	-	-	0	-	-	-	-	3	-	-	-	-	5	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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Counted By: Mio
 Set Up By: JH:
 Weather: Clear:

Count Name: Springhouse Rd &
 Winchester Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 2



Turning Movement Data Plot



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Springhouse Rd &
 Winchester Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

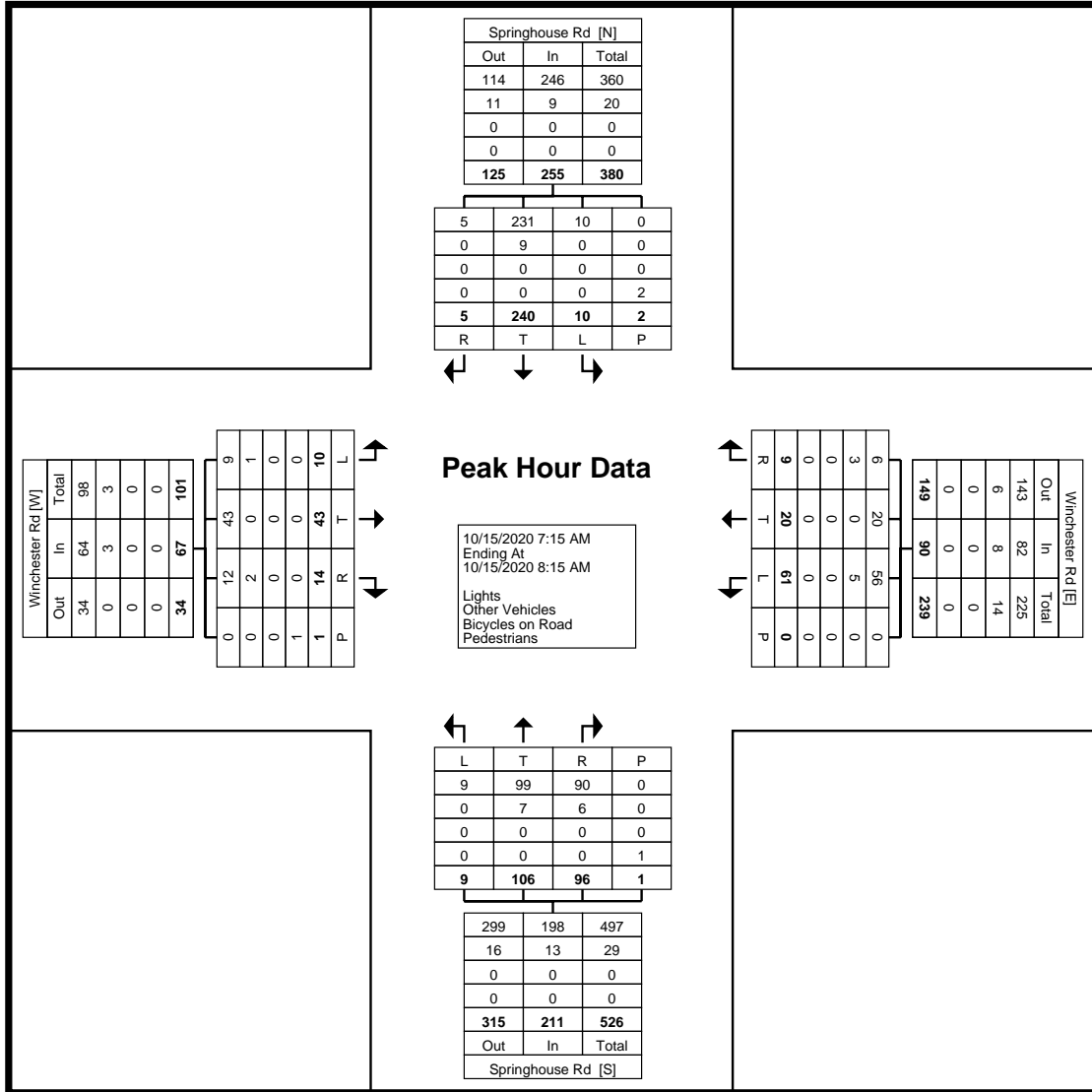
Start Time	Winchester Rd Eastbound					Winchester Rd Westbound					Springhouse Rd Northbound					Springhouse Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:15 AM	3	11	7	0	21	13	3	2	0	18	2	41	17	0	60	3	69	2	0	74	173
7:30 AM	1	13	2	1	16	14	4	0	0	18	2	21	25	1	48	2	68	2	1	72	154
7:45 AM	2	14	4	0	20	18	5	5	0	28	4	26	33	0	63	3	47	0	0	50	161
8:00 AM	4	5	1	0	10	16	8	2	0	26	1	18	21	0	40	2	56	1	1	59	135
Total	10	43	14	1	67	61	20	9	0	90	9	106	96	1	211	10	240	5	2	255	623
Approach %	14.9	64.2	20.9	-	-	67.8	22.2	10.0	-	-	4.3	50.2	45.5	-	-	3.9	94.1	2.0	-	-	-
Total %	1.6	6.9	2.2	-	10.8	9.8	3.2	1.4	-	14.4	1.4	17.0	15.4	-	33.9	1.6	38.5	0.8	-	40.9	-
PHF	0.625	0.768	0.500	-	0.798	0.847	0.625	0.450	-	0.804	0.563	0.646	0.727	-	0.837	0.833	0.870	0.625	-	0.861	0.900
Lights	9	43	12	-	64	56	20	6	-	82	9	99	90	-	198	10	231	5	-	246	590
% Lights	90.0	100.0	85.7	-	95.5	91.8	100.0	66.7	-	91.1	100.0	93.4	93.8	-	93.8	100.0	96.3	100.0	-	96.5	94.7
Other Vehicles	1	0	2	-	3	5	0	3	-	8	0	7	6	-	13	0	9	0	-	9	33
% Other Vehicles	10.0	0.0	14.3	-	4.5	8.2	0.0	33.3	-	8.9	0.0	6.6	6.3	-	6.2	0.0	3.8	0.0	-	3.5	5.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	1	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Springhouse Rd &
 Winchester Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 4



Turning Movement Peak Hour Data Plot (7:15 AM)



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Counted By: Mio:
 Set Up By: JH:
 Weather: Clear:

Count Name: Springhouse Rd &
 Winchester Rd
 Site Code:
 Start Date: 10/15/2020
 Page No: 5

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Winchester Rd Eastbound					Winchester Rd Westbound					Springhouse Rd Northbound					Springhouse Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
4:00 PM	0	5	2	1	7	37	13	11	0	61	3	77	26	0	106	1	58	2	0	61	235
4:15 PM	2	11	3	1	16	41	15	11	0	67	6	71	27	0	104	4	47	2	0	53	240
4:30 PM	2	13	2	4	17	40	13	10	0	63	9	64	23	0	96	2	43	1	0	46	222
4:45 PM	1	5	2	1	8	44	12	6	0	62	7	58	28	0	93	4	48	1	0	53	216
Total	5	34	9	7	48	162	53	38	0	253	25	270	104	0	399	11	196	6	0	213	913
Approach %	10.4	70.8	18.8	-	-	64.0	20.9	15.0	-	-	6.3	67.7	26.1	-	-	5.2	92.0	2.8	-	-	-
Total %	0.5	3.7	1.0	-	5.3	17.7	5.8	4.2	-	27.7	2.7	29.6	11.4	-	43.7	1.2	21.5	0.7	-	23.3	-
PHF	0.625	0.654	0.750	-	0.706	0.920	0.883	0.864	-	0.944	0.694	0.877	0.929	-	0.941	0.688	0.845	0.750	-	0.873	0.951
Lights	5	33	8	-	46	162	53	36	-	251	25	265	103	-	393	11	194	5	-	210	900
% Lights	100.0	97.1	88.9	-	95.8	100.0	100.0	94.7	-	99.2	100.0	98.1	99.0	-	98.5	100.0	99.0	83.3	-	98.6	98.6
Other Vehicles	0	0	0	-	0	0	0	1	-	1	0	5	1	-	6	0	2	1	-	3	10
% Other Vehicles	0.0	0.0	0.0	-	0.0	0.0	0.0	2.6	-	0.4	0.0	1.9	1.0	-	1.5	0.0	1.0	16.7	-	1.4	1.1
Bicycles on Road	0	1	1	-	2	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	3
% Bicycles on Road	0.0	2.9	11.1	-	4.2	0.0	0.0	2.6	-	0.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.3
Pedestrians	-	-	-	7	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Counted By: Mio:
Set Up By: JH:
Weather: Clear:

Count Name: Springhouse Rd &
Winchester Rd
Site Code:
Start Date: 10/15/2020
Page No: 7

ATR Counts

**Existing Parkview Inn Driveway
Volume**

Site Code:
Station ID:

Latitude: 0' 0.0000 South

Start Time	14-Oct-20		SB		NB		Combined		15-Oct-		SB		NB		Combined	
	Wed		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Thu	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.
12:00	*	*	*	*	*	*	*	*		2	4	2	6	4	10	
12:15	*	*	*	*	*	*	*	*		1	3	0	5	1	8	
12:30	*	*	*	*	*	*	*	*		2	4	2	6	4	10	
12:45	*	*	*	*	*	*	*	*		1	3	2	3	3	6	
01:00	*	*	*	*	*	*	*	*		2	2	1	2	3	4	
01:15	*	*	*	*	*	*	*	*		1	3	2	1	3	4	
01:30	*	*	*	*	*	*	*	*		2	2	0	2	2	4	
01:45	*	*	*	*	*	*	*	*		1	4	3	4	4	8	
02:00	*	3	*	4	*	7	*	7		0	6	2	4	2	10	
02:15	*	2	*	2	*	4	*	4		1	3	1	5	2	8	
02:30	*	5	*	4	*	9	*	9		0	4	0	3	0	7	
02:45	*	5	*	0	*	5	*	5		0	3	0	3	0	6	
03:00	*	3	*	4	*	7	*	7		1	2	0	6	1	8	
03:15	*	3	*	3	*	6	*	6		0	1	0	4	0	5	
03:30	*	3	*	7	*	10	*	10		0	3	0	1	0	4	
03:45	*	4	*	5	*	9	*	9		0	8	0	2	0	10	
04:00	*	4	*	3	*	7	*	7		0	4	1	6	1	10	
04:15	*	5	*	6	*	11	*	11		1	3	1	1	2	4	
04:30	*	1	*	5	*	6	*	6		0	1	1	9	1	10	
04:45	*	3	*	3	*	6	*	6		1	1	3	1	4	2	
05:00	*	7	*	4	*	11	*	11		4	4	0	4	4	8	
05:15	*	2	*	3	*	5	*	5		3	2	2	5	5	7	
05:30	*	6	*	2	*	8	*	8		3	1	2	6	5	7	
05:45	*	8	*	1	*	9	*	9		1	6	3	4	4	10	
06:00	*	2	*	6	*	8	*	8		1	4	2	1	3	5	
06:15	*	6	*	2	*	8	*	8		0	3	3	4	3	7	
06:30	*	3	*	9	*	12	*	12		0	5	3	5	3	10	
06:45	*	6	*	7	*	13	*	13		2	4	4	2	6	6	
07:00	*	3	*	5	*	8	*	8		2	4	2	2	4	6	
07:15	*	5	*	2	*	7	*	7		2	5	3	3	5	8	
07:30	*	1	*	1	*	2	*	2		0	5	4	3	4	8	
07:45	*	5	*	2	*	7	*	7		0	2	1	2	1	4	
08:00	*	5	*	3	*	8	*	8		2	2	4	1	6	3	
08:15	*	5	*	2	*	7	*	7		2	6	2	6	4	12	
08:30	*	6	*	3	*	9	*	9		3	1	2	1	5	2	
08:45	*	3	*	2	*	5	*	5		8	3	3	1	11	4	
09:00	*	1	*	4	*	5	*	5		0	2	8	2	8	4	
09:15	*	8	*	1	*	9	*	9		1	2	2	1	3	3	
09:30	*	6	*	3	*	9	*	9		1	3	3	2	4	5	
09:45	*	4	*	8	*	12	*	12		1	2	3	1	4	3	
10:00	*	6	*	3	*	9	*	9		2	1	2	1	4	2	
10:15	*	4	*	2	*	6	*	6		2	4	0	0	2	4	
10:30	*	3	*	2	*	5	*	5		2	4	4	2	6	6	
10:45	*	4	*	2	*	6	*	6		1	0	2	6	3	6	
11:00	*	1	*	1	*	2	*	2		2	0	2	3	4	3	
11:15	*	6	*	5	*	11	*	11		1	3	2	1	3	4	
11:30	*	0	*	2	*	2	*	2		0	4	1	2	1	6	
11:45	*	1	*	0	*	1	*	1		3	2	3	2	6	4	
Total	0	158	0	133	0	291	65	148	93	147	158	295				
Day Total	0.0%	54.3%	0.0%	45.7%	0.0%	45.7%	14.3%	32.7%	20.5%	32.5%	14.3%	32.7%	20.5%	32.5%	14.3%	32.7%
Peak Vol.	-	-	09:15	-	06:00	-	06:00	-	08:00	03:30	08:45	12:00	08:15	12:00	-	-
P.H.F.	-	-	0.750	-	0.667	-	0.788	-	0.469	0.563	0.500	0.833	0.636	0.850	-	-

**Existing Parkview Inn Driveway
Volume**

Site Code:
Station ID:

Latitude: 0' 0.0000 South

Start Time	16-Oct-20				17-Oct-									
	Fri	SB		NB		Sat	SB		NB		Combined			
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		
12:00	3	1	2	2	5	3	6	1	1	6	7	7		
12:15	1	1	1	4	2	5	3	3	1	1	4	4		
12:30	3	2	0	1	3	3	1	2	2	3	3	5		
12:45	1	5	2	2	3	7	1	6	1	7	2	13		
01:00	1	5	0	3	1	8	1	5	0	5	1	10		
01:15	0	2	1	8	1	10	4	4	3	6	7	10		
01:30	4	2	1	3	5	5	1	6	3	3	4	9		
01:45	0	2	0	3	0	5	2	0	1	7	3	7		
02:00	2	6	3	1	5	7	2	3	1	2	3	5		
02:15	0	5	0	7	0	12	0	3	0	4	0	7		
02:30	1	1	1	6	2	7	0	4	0	4	0	8		
02:45	2	2	1	4	3	6	0	3	0	6	0	9		
03:00	1	4	0	2	1	6	2	3	1	3	3	6		
03:15	0	3	1	6	1	9	1	5	1	3	2	8		
03:30	0	3	0	1	0	4	0	5	1	5	1	10		
03:45	1	3	0	2	1	5	2	3	1	4	3	7		
04:00	0	2	1	1	1	3	0	5	4	3	4	8		
04:15	0	2	0	2	0	4	0	2	0	1	0	3		
04:30	0	5	1	2	1	7	0	1	2	2	2	3		
04:45	1	0	1	3	2	3	1	9	3	0	4	9		
05:00	3	4	2	2	5	6	3	2	1	7	4	9		
05:15	3	4	1	5	4	9	2	3	1	4	3	7		
05:30	0	5	2	5	2	10	0	5	1	4	1	9		
05:45	1	5	6	5	7	10	1	6	1	7	2	13		
06:00	1	3	1	6	2	9	0	9	0	2	0	11		
06:15	0	5	1	4	1	9	0	4	1	6	1	10		
06:30	0	8	0	3	0	11	1	6	1	4	2	10		
06:45	0	3	0	2	0	5	3	5	3	6	6	11		
07:00	1	12	4	7	5	19	2	5	1	4	3	9		
07:15	4	3	4	3	8	6	1	5	3	4	4	9		
07:30	0	6	2	6	2	12	0	5	0	4	0	9		
07:45	1	5	2	2	3	7	1	4	2	1	3	5		
08:00	2	9	2	4	4	13	3	5	4	4	7	9		
08:15	2	4	1	7	3	11	3	5	4	2	7	7		
08:30	2	3	3	4	5	7	0	6	5	5	5	11		
08:45	4	8	3	0	7	8	1	3	3	0	4	3		
09:00	1	3	1	5	2	8	3	4	2	3	5	7		
09:15	2	3	4	2	6	5	3	4	4	4	7	8		
09:30	2	2	3	3	5	5	5	6	5	2	10	8		
09:45	5	4	5	3	10	7	4	7	4	3	8	10		
10:00	2	6	11	4	13	10	3	1	5	1	8	2		
10:15	2	3	2	1	4	4	2	7	6	2	8	9		
10:30	3	5	3	2	6	7	8	4	4	0	12	4		
10:45	3	2	8	0	11	2	0	1	3	4	3	5		
11:00	4	7	2	6	6	13	2	1	4	2	6	3		
11:15	5	0	4	3	9	3	2	2	4	0	6	2		
11:30	2	6	1	2	3	8	2	2	5	2	7	4		
11:45	7	4	5	0	12	4	4	3	4	1	8	4		
Total	83	188	99	159	182	347	86	193	107	163	193	356		
Day Total	271		258		529		279		270		549			
% Total	15.7%	35.5%	18.7%	30.1%			15.7%	35.2%	19.5%	29.7%				
Peak	-	11:00	06:15	10:00	05:15	09:15	06:15	-	09:45	05:45	09:30	05:00	09:45	05:45
Vol.	-	18	28	24	21	34	44	-	17	25	20	22	36	44
P.H.F.		0.643	0.583	0.545	0.875	0.654	0.579		0.531	0.694	0.833	0.786	0.750	0.846

**Existing Parkview Inn Driveway
Volume**

Site Code:
Station ID:

Latitude: 0' 0.0000 South

Start Time	18-Oct-20 Sun		SB		NB		Combined		19-Oct- Mon		SB		NB		Combined	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	1	9	1	14	2	23	0	6	1	3	1	3	1	9		
12:15	3	2	2	8	5	10	3	1	0	1	3	2				
12:30	0	4	0	4	0	8	1	1	2	4	3	5				
12:45	1	1	1	5	2	6	2	3	3	1	5	4				
01:00	5	3	0	4	5	7	0	1	3	4	3	5				
01:15	0	6	1	8	1	14	0	4	0	4	0	8				
01:30	0	1	1	2	1	3	0	3	0	4	0	7				
01:45	2	4	1	3	3	7	0	2	1	5	1	7				
02:00	3	4	2	3	5	7	2	3	0	4	2	7				
02:15	0	3	4	4	4	7	1	4	0	1	1	5				
02:30	1	3	1	1	2	4	1	3	1	4	2	7				
02:45	1	0	0	4	1	4	0	2	2	7	2	9				
03:00	0	3	0	2	0	5	0	2	1	2	1	4				
03:15	0	5	0	7	0	12	1	8	0	3	1	11				
03:30	0	5	1	2	1	7	0	5	0	3	0	8				
03:45	0	1	1	4	1	5	0	5	0	8	0	13				
04:00	1	5	0	3	1	8	0	2	0	5	0	7				
04:15	1	4	2	7	3	11	0	2	1	5	1	7				
04:30	0	3	1	3	1	6	0	5	1	2	1	7				
04:45	0	5	0	3	0	8	0	5	0	3	0	8				
05:00	1	0	1	1	2	1	3	5	1	6	4	11				
05:15	1	4	1	2	2	6	4	7	2	3	6	10				
05:30	1	1	1	1	2	2	3	3	2	2	5	5				
05:45	1	2	1	6	2	8	0	5	3	2	3	7				
06:00	0	9	4	0	4	9	0	0	2	5	2	5				
06:15	1	3	0	5	1	8	0	4	1	2	1	6				
06:30	0	2	2	3	2	5	1	3	0	3	1	6				
06:45	1	2	0	3	1	5	2	5	2	4	4	9				
07:00	3	1	3	1	6	2	2	5	5	2	7	7				
07:15	1	4	1	0	2	4	1	8	2	4	3	12				
07:30	1	8	0	3	1	11	2	1	2	2	4	3				
07:45	0	3	2	3	2	6	2	2	2	3	4	5				
08:00	2	1	3	5	5	6	1	5	0	4	1	9				
08:15	2	6	1	2	3	8	1	3	3	5	4	8				
08:30	1	2	2	0	3	2	4	2	3	2	7	4				
08:45	5	3	4	2	9	5	5	3	4	1	9	4				
09:00	1	2	1	1	2	3	2	1	2	2	4	3				
09:15	1	3	5	4	6	7	3	2	5	0	8	2				
09:30	1	2	3	1	4	3	4	2	7	4	11	6				
09:45	1	1	2	5	3	6	1	5	0	2	1	7				
10:00	4	0	5	2	9	2	4	0	2	1	6	1				
10:15	2	3	5	2	7	5	1	2	3	2	4	4				
10:30	2	4	4	0	6	4	0	2	1	1	1	3				
10:45	2	3	2	0	4	3	0	2	1	1	1	3				
11:00	0	4	9	2	9	6	3	0	1	3	4	3				
11:15	1	0	1	2	2	2	1	2	4	0	5	2				
11:30	3	0	2	0	5	0	1	1	3	1	4	2				
11:45	5	1	5	1	10	2	2	4	2	2	4	6				
Total	63	145	89	148	152	293	64	151	81	142	145	293				
Day Total	208	237	445	215	223	438										
% Total	14.2%	32.6%	20.0%	33.3%	14.6%	34.5%	18.5%	32.4%								
Peak	-	08:00	07:30	10:15	12:00	10:00	12:00	-	08:30	04:30	08:45	03:30	08:45	03:15		
Vol.	-	10	18	20	31	26	47	-	14	22	18	21	32	39		
P.H.F.		0.500	0.500	0.556	0.554	0.722	0.511		0.700	0.688	0.643	0.656	0.727	0.750		

Springhouse Road
Volume

Site Code:
Station ID:

Latitude: 0' 0.0000 South

Start Time	14-Oct-20		SB		NB		Combined		15-Oct-		SB		NB		Combined		
	Wed		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Thu		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	
12:00	*		60		*	73	*	133			2	0	0	0	2	0	
12:15	*		79		*	65	*	144			3	1	1	0	4	1	
12:30	*		73		*	67	*	140			1	3	1	0	2	3	
12:45	*		66		*	87	*	153			0	0	3	0	3	0	
01:00	*		80		*	93	*	173			1	0	0	0	1	0	
01:15	*		95		*	118	*	213			1	0	0	0	1	0	
01:30	*		120		*	95	*	215			0	0	0	0	0	0	
01:45	*		121		*	92	*	213			0	4	1	0	1	4	
02:00	*		115		*	94	*	209			0	0	1	0	1	0	
02:15	*		98		*	137	*	235			0	0	1	0	1	0	
02:30	*		73		*	104	*	177			0	1	0	0	0	1	
02:45	*		87		*	103	*	190			1	0	0	0	1	0	
03:00	*		113		*	138	*	251			0	0	0	0	0	0	
03:15	*		95		*	111	*	206			0	1	1	1	1	2	
03:30	*		98		*	111	*	209			4	0	2	0	6	0	
03:45	*		88		*	111	*	199			5	0	3	0	8	0	
04:00	*		96		*	108	*	204			3	0	5	0	8	0	
04:15	*		101		*	129	*	230			8	0	4	0	12	0	
04:30	*		80		*	97	*	177			5	0	3	0	8	0	
04:45	*		82		*	99	*	181			15	0	5	0	20	0	
05:00	*		68		*	84	*	152			12	0	3	0	15	0	
05:15	*		69		*	76	*	145			28	0	9	0	37	0	
05:30	*		46		*	68	*	114			26	0	18	0	44	0	
05:45	*		60		*	64	*	124			50	1	29	0	79	1	
06:00	*		66		*	62	*	128			35	0	56	0	91	0	
06:15	*		41		*	49	*	90			60	0	107	0	167	0	
06:30	*		35		*	49	*	84			114	0	79	0	193	0	
06:45	*		28		*	33	*	61			87	0	69	0	156	0	
07:00	*		27		*	32	*	59			70	0	43	0	113	0	
07:15	*		26		*	31	*	57			56	0	54	0	110	0	
07:30	*		17		*	25	*	42			50	0	47	0	97	0	
07:45	*		21		*	17	*	38			82	0	73	0	155	0	
08:00	*		21		*	23	*	44			73	0	57	0	130	0	
08:15	*		17		*	17	*	34			57	0	41	0	98	0	
08:30	*		10		*	16	*	26			71	0	43	0	114	0	
08:45	*		9		*	9	*	18			60	0	62	0	122	0	
09:00	*		18		*	8	*	26			56	0	62	0	118	0	
09:15	*		6		*	6	*	12			40	0	54	0	94	0	
09:30	*		3		*	8	*	11			52	0	69	0	121	0	
09:45	*		2		*	5	*	7			67	0	62	0	129	0	
10:00	*		4		*	3	*	7			58	0	45	0	103	0	
10:15	*		2		*	12	*	14			62	0	73	0	135	0	
10:30	*		5		*	8	*	13			62	0	36	0	98	0	
10:45	*		1		*	3	*	4			105	0	9	0	114	0	
11:00	*		1		*	3	*	4			100	0	17	0	117	0	
11:15	*		0		*	2	*	2			102	0	19	0	121	0	
11:30	*		0		*	3	*	3			106	0	29	0	135	0	
11:45	*		0		*	4	*	4			2	0	1	0	3	0	
Total		0	2423		0	2752		0	5175		1792	11	1297		1	3089	12
Day Total			2423			2752			5175		1803	0.4%	41.8%		0.0%	3101	
% Total		0.0%	46.8%		0.0%	53.2%					57.8%	0.4%	41.8%		0.0%		
Peak	-	-	01:30		-	02:15		-	01:30		-	10:45	01:45	06:00	02:30	06:15	01:45
Vol.	-	-	454		-	482		-	872		-	413	5	311	1	629	5
P.H.F.			0.938			0.873			0.928			0.974	0.313	0.727	0.250	0.815	0.313

Springhouse Road
Volume

Site Code:
Station ID:

Latitude: 0' 0.0000 South

Start Time	16-Oct-20				17-Oct-											
	Fri	SB		NB		Sat	SB		NB		Combined					
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.				
12:00	0	0	0	0	0	0	0	0	0	0	0	0				
12:15	0	0	0	0	0	0	0	0	0	0	0	0				
12:30	0	0	0	0	0	0	0	0	0	0	0	0				
12:45	0	3	0	0	0	0	3	0	0	0	0	0				
01:00	0	0	0	0	0	0	0	0	0	0	0	0				
01:15	0	0	0	0	0	0	0	0	0	0	0	0				
01:30	0	0	0	0	0	0	0	0	0	0	0	0				
01:45	0	0	0	0	0	0	0	0	0	0	0	0				
02:00	0	0	0	0	0	0	0	0	0	0	0	0				
02:15	0	0	0	0	0	0	0	0	0	0	0	0				
02:30	0	0	0	0	0	0	0	0	0	0	0	0				
02:45	0	0	0	0	0	0	0	0	0	0	0	0				
03:00	0	0	0	0	0	0	0	0	0	0	0	0				
03:15	0	0	0	0	0	0	0	0	0	0	0	0				
03:30	0	0	0	0	0	0	0	0	0	0	0	0				
03:45	0	0	0	0	0	0	0	0	0	0	0	0				
04:00	0	0	0	0	0	0	0	0	0	0	0	0				
04:15	0	0	0	0	0	0	0	0	0	0	0	0				
04:30	0	0	0	0	0	0	0	0	0	0	0	0				
04:45	0	0	0	0	0	0	0	0	0	0	0	0				
05:00	0	0	0	0	0	0	0	0	0	0	0	0				
05:15	0	0	0	0	0	0	0	0	0	0	0	0				
05:30	0	1	0	0	0	0	1	0	0	0	0	0				
05:45	0	0	0	0	0	0	0	0	0	0	0	0				
06:00	0	0	0	0	0	0	0	0	0	0	0	0				
06:15	0	0	0	0	0	0	0	0	0	0	0	0				
06:30	0	0	0	0	0	0	0	0	0	0	0	0				
06:45	0	0	0	0	0	0	0	0	0	0	0	0				
07:00	0	0	0	0	0	0	0	0	0	0	0	0				
07:15	0	0	0	0	0	0	0	0	0	0	0	0				
07:30	0	0	0	0	0	0	0	0	0	0	0	0				
07:45	0	0	0	0	0	0	0	0	0	0	0	0				
08:00	0	0	0	0	0	0	0	0	0	0	0	0				
08:15	0	0	0	0	0	0	0	0	0	0	0	0				
08:30	0	0	0	0	0	0	0	0	0	0	0	0				
08:45	0	0	0	0	0	0	0	0	0	0	0	0				
09:00	0	0	0	0	0	0	0	0	0	0	0	0				
09:15	0	0	0	0	0	0	0	0	0	0	0	0				
09:30	0	0	0	0	0	0	0	0	0	0	0	0				
09:45	0	0	0	0	0	0	0	0	0	0	0	0				
10:00	0	0	0	0	0	0	0	0	0	0	0	0				
10:15	0	0	0	0	0	0	0	0	0	0	0	0				
10:30	0	0	0	0	0	0	0	0	0	0	0	0				
10:45	0	0	0	0	0	0	0	0	0	0	0	0				
11:00	0	0	0	0	0	0	0	0	0	0	0	0				
11:15	0	0	0	0	0	0	0	0	0	0	0	0				
11:30	0	0	0	0	0	0	0	0	0	0	0	0				
11:45	0	0	0	0	0	0	0	0	0	0	0	0				
Total	0	4	4	0	0	0	4	4	0	1	1	0	0	0	1	1
Day Total		4	4	0	0	0	4	4		1	1	0	0	0	1	1
% Total	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Peak	-	-	12:00	-	-	-	12:00	12:00	-	-	01:30	-	-	-	-	01:30
Vol.	-	-	3	-	-	-	3	3	-	-	1	-	-	-	-	1
P.H.F.			0.250				0.250	0.250			0.250					0.250

Winchester Road
Volume

Site Code:
Station ID:

Latitude: 40' 36.2412 North

Start Time	14-Oct-20		SB		NB		Combined		15-Oct-		SB		NB		Combined	
	Wed		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Thu	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	
12:00	*	*	*	*	*	*	*	*	0	6	0	2	0	0	8	
12:15	*	*	*	*	*	*	*	*	0	6	0	4	0	0	10	
12:30	*	*	*	*	*	*	*	*	0	5	0	4	0	0	9	
12:45	*	*	*	*	*	*	*	*	0	6	0	7	0	0	13	
01:00	*	*	*	*	*	*	*	*	0	3	0	2	0	0	5	
01:15	*	*	*	*	*	*	*	*	0	3	0	1	0	0	4	
01:30	*	*	*	*	*	*	*	*	0	0	0	4	0	0	4	
01:45	*	*	*	*	*	*	*	*	0	0	0	0	0	0	0	
02:00	*	1	*	2	*	2	*	3	0	4	0	5	0	0	9	
02:15	*	2	*	7	*	7	*	9	0	0	0	7	0	0	7	
02:30	*	5	*	9	*	9	*	14	0	5	0	7	0	0	12	
02:45	*	7	*	7	*	7	*	14	0	4	0	7	0	0	11	
03:00	*	8	*	5	*	5	*	13	0	4	0	6	0	0	10	
03:15	*	2	*	12	*	12	*	14	0	4	0	6	0	0	10	
03:30	*	0	*	6	*	6	*	6	0	2	0	7	0	0	9	
03:45	*	4	*	4	*	4	*	8	0	3	0	3	0	0	6	
04:00	*	2	*	5	*	5	*	7	0	5	0	9	0	0	14	
04:15	*	1	*	4	*	4	*	5	0	3	0	5	0	0	8	
04:30	*	1	*	4	*	4	*	5	0	4	0	5	0	0	9	
04:45	*	4	*	6	*	6	*	10	0	1	0	0	0	0	1	
05:00	*	3	*	5	*	5	*	8	0	4	0	8	0	0	12	
05:15	*	4	*	6	*	6	*	10	1	4	0	4	1	0	8	
05:30	*	3	*	4	*	4	*	7	0	2	0	7	0	0	9	
05:45	*	2	*	5	*	5	*	7	0	2	0	3	0	0	5	
06:00	*	3	*	3	*	3	*	6	0	3	0	4	0	0	7	
06:15	*	4	*	3	*	3	*	7	0	3	1	6	1	0	9	
06:30	*	5	*	4	*	4	*	9	0	2	1	1	1	0	3	
06:45	*	2	*	1	*	1	*	3	1	4	0	0	1	0	4	
07:00	*	3	*	2	*	2	*	5	1	2	7	2	8	0	4	
07:15	*	1	*	2	*	2	*	3	4	3	2	1	6	0	4	
07:30	*	0	*	0	*	0	*	0	3	3	1	3	4	0	6	
07:45	*	0	*	3	*	3	*	3	2	1	8	1	10	0	2	
08:00	*	0	*	0	*	0	*	0	2	0	6	0	8	0	0	
08:15	*	0	*	0	*	0	*	0	5	2	4	0	9	0	2	
08:30	*	4	*	0	*	0	*	4	9	0	5	1	14	0	1	
08:45	*	0	*	1	*	1	*	1	5	1	2	1	7	0	2	
09:00	*	0	*	0	*	0	*	0	2	1	3	1	5	0	2	
09:15	*	0	*	0	*	0	*	0	6	1	0	0	6	0	1	
09:30	*	2	*	1	*	1	*	3	4	3	2	1	6	0	4	
09:45	*	2	*	0	*	0	*	2	5	0	3	1	8	0	1	
10:00	*	1	*	0	*	0	*	1	2	0	4	4	6	0	4	
10:15	*	0	*	1	*	1	*	1	1	0	0	0	1	0	0	
10:30	*	0	*	0	*	0	*	0	1	0	2	0	3	0	0	
10:45	*	1	*	0	*	0	*	1	3	0	1	0	4	0	0	
11:00	*	1	*	1	*	1	*	2	4	0	2	1	6	0	1	
11:15	*	0	*	0	*	0	*	0	1	0	3	0	4	0	0	
11:30	*	0	*	0	*	0	*	0	4	0	5	0	9	0	0	
11:45	*	0	*	0	*	0	*	0	2	0	6	1	8	0	1	
Total		0	78	0	113	0	191		68	109	68	142	136	387	251	
Day Total		78		113		191		177		210		387				
% Total		0.0%	40.8%	0.0%	59.2%			17.6%	28.2%	17.6%	36.7%					
Peak	-	-	02:15	-	02:30	-	02:30	-	08:30	12:00	07:45	02:15	07:45	02:30		
Vol.	-	-	22	-	33	-	55	-	22	23	23	27	41	43		
P.H.F.			0.688		0.688		0.982		0.611	0.958	0.719	0.964	0.732	0.827		

**Winchester Road
Volume**

Site Code:
Station ID:

Latitude: 40' 36.2412 North

Start Time	16-Oct-20				17-Oct-									
	Fri	SB		NB		Sat	SB		NB		Combined			
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		
12:00	0	5	1	6	1	11	0	5	1	5	1	10		
12:15	0	2	0	2	0	4	0	3	0	2	0	5		
12:30	0	0	0	2	0	2	0	5	1	0	1	5		
12:45	0	3	0	6	0	9	0	7	0	5	0	12		
01:00	0	4	0	4	0	8	0	3	1	6	1	9		
01:15	0	9	0	6	0	15	1	9	0	1	1	10		
01:30	0	9	0	1	0	10	0	7	0	1	0	8		
01:45	0	3	0	0	0	3	0	0	0	1	0	1		
02:00	0	5	0	4	0	9	0	8	0	2	0	10		
02:15	0	6	0	6	0	12	0	4	0	2	0	6		
02:30	0	4	0	7	0	11	0	1	0	0	0	1		
02:45	0	12	0	8	0	20	0	4	0	3	0	7		
03:00	1	10	0	6	1	16	0	3	0	0	0	3		
03:15	0	4	0	5	0	9	0	2	0	5	0	7		
03:30	0	2	0	2	0	4	0	6	0	1	0	7		
03:45	0	7	0	7	0	14	0	4	0	2	0	6		
04:00	0	5	0	4	0	9	0	3	0	3	0	6		
04:15	0	5	0	3	0	8	0	5	0	1	0	6		
04:30	0	4	0	3	0	7	0	6	0	1	0	7		
04:45	0	8	0	4	0	12	1	4	0	1	1	5		
05:00	0	3	0	4	0	7	0	4	0	3	0	7		
05:15	1	3	0	7	1	10	0	5	0	0	0	5		
05:30	1	2	1	4	2	6	0	6	0	3	0	9		
05:45	0	2	0	5	0	7	0	3	0	1	0	4		
06:00	1	1	0	1	1	2	0	6	0	3	0	9		
06:15	1	4	0	1	1	5	0	4	0	2	0	6		
06:30	0	3	1	2	1	5	0	4	0	5	0	9		
06:45	0	2	0	1	0	3	2	4	0	2	2	6		
07:00	0	3	2	1	2	4	1	1	0	1	1	2		
07:15	2	1	4	1	6	2	2	5	0	1	2	6		
07:30	3	2	2	0	5	2	2	4	1	0	3	4		
07:45	4	3	7	2	11	5	1	2	0	0	1	2		
08:00	3	0	8	0	11	0	1	1	0	1	1	2		
08:15	2	0	1	0	3	0	4	4	0	0	4	4		
08:30	5	0	1	3	6	3	3	3	0	0	3	3		
08:45	7	2	3	2	10	4	3	1	1	3	4	4		
09:00	2	2	2	2	4	4	6	1	1	0	7	1		
09:15	2	1	0	1	2	2	2	0	0	0	2	0		
09:30	3	1	3	0	6	1	4	0	0	1	4	1		
09:45	2	3	2	0	4	3	2	4	0	3	2	7		
10:00	2	0	1	1	3	1	2	2	1	0	3	2		
10:15	0	0	0	0	0	0	4	2	1	0	5	2		
10:30	0	0	1	0	1	0	4	0	4	0	8	0		
10:45	5	0	1	0	6	0	2	1	4	0	6	1		
11:00	2	1	5	1	7	2	4	1	1	1	5	2		
11:15	1	0	3	0	4	0	11	0	1	0	12	0		
11:30	2	0	5	0	7	0	5	0	9	0	14	0		
11:45	2	0	7	0	9	0	2	0	1	0	3	0		
Total	54	146	61	125	115	271	69	157	28	72	97	229		
Day Total	200		186		386		226		100		326			
% Total	14.0%	37.8%	15.8%	32.4%			21.2%	48.2%	8.6%	22.1%				
Peak Vol.	-	08:00	02:15	07:15	02:15	07:15	02:15	-	10:45	00:45	10:45	00:15	10:45	00:45
P.H.F.	-	17	32	21	27	33	59	-	22	26	15	13	37	39
		0.607	0.667	0.656	0.844	0.750	0.738		0.500	0.722	0.417	0.542	0.661	0.813

Winchester Road Volume

Site Code:
Station ID:

Latitude: 40' 36.2412 North

Start Time	18-Oct-20 Sun		SB		NB		Combined		19-Oct-Mon		SB		NB		Combined	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	0	5	0	6	0	11	0	3	0	3	0	3	0	0	6	
12:15	0	2	0	1	0	3	0	6	0	2	0	2	0	0	8	
12:30	0	7	0	5	0	12	1	5	0	1	1	1	1	6		
12:45	0	3	0	1	0	4	0	2	0	2	0	2	0	4		
01:00	0	2	0	1	0	3	0	3	0	3	0	3	0	6		
01:15	0	6	0	5	0	11	0	4	0	6	0	6	0	10		
01:30	0	5	0	5	0	10	0	2	0	4	0	4	0	6		
01:45	0	4	0	1	0	5	0	3	0	1	0	1	0	4		
02:00	0	2	0	1	0	3	0	2	0	1	0	1	0	3		
02:15	0	2	0	2	0	4	0	8	0	7	0	7	0	15		
02:30	0	5	0	2	0	7	0	2	0	2	0	2	0	4		
02:45	0	6	0	2	0	8	0	7	0	10	0	10	0	17		
03:00	0	2	0	1	0	3	0	8	0	3	0	3	0	11		
03:15	0	4	0	2	0	6	0	0	0	8	0	8	0	8		
03:30	0	3	0	4	0	7	0	7	0	2	0	2	0	9		
03:45	0	1	0	3	0	4	0	3	0	9	0	9	0	12		
04:00	0	4	0	1	0	5	0	4	0	2	0	2	0	6		
04:15	0	1	0	2	0	3	0	4	0	8	0	8	0	12		
04:30	0	4	0	3	0	7	0	2	0	8	0	8	0	10		
04:45	0	4	0	3	0	7	0	0	0	1	0	1	0	1		
05:00	0	5	0	3	0	8	0	3	0	1	0	1	0	4		
05:15	0	2	0	3	0	5	1	6	0	5	1	6	1	11		
05:30	0	2	0	1	0	3	0	0	0	6	0	6	0	6		
05:45	0	4	0	2	0	6	0	2	0	2	0	2	0	4		
06:00	0	2	0	1	0	3	1	4	0	5	1	6	1	9		
06:15	1	1	1	1	2	2	0	4	0	3	0	3	0	7		
06:30	0	1	0	1	0	2	1	3	1	2	2	3	2	5		
06:45	1	2	0	0	1	2	0	3	0	2	0	2	0	5		
07:00	0	1	0	0	0	1	3	1	0	0	3	1	0	1		
07:15	0	1	2	1	2	2	1	2	3	2	4	2	4	4		
07:30	1	2	0	1	1	3	6	0	5	0	11	0	11	0		
07:45	3	0	3	0	6	0	4	2	4	3	8	5	8	5		
08:00	0	0	0	0	0	0	7	3	3	1	10	4	10	4		
08:15	0	0	0	1	0	1	8	1	4	0	12	1	12	1		
08:30	1	0	0	0	1	0	6	2	1	4	7	6	7	6		
08:45	2	2	0	0	2	2	4	2	6	1	10	3	10	3		
09:00	3	2	0	1	3	3	1	0	2	0	3	0	3	0		
09:15	0	0	0	1	0	1	2	0	4	1	6	1	6	1		
09:30	1	2	1	1	2	3	2	0	3	0	5	0	5	0		
09:45	1	0	0	0	1	0	3	0	2	0	5	0	5	0		
10:00	1	0	1	0	2	0	4	0	0	0	4	0	4	0		
10:15	2	0	2	0	4	0	1	0	0	1	1	1	1	1		
10:30	3	0	2	0	5	0	1	1	0	0	1	1	1	1		
10:45	3	0	0	0	3	0	3	0	1	0	4	0	4	0		
11:00	2	0	2	0	4	0	0	0	3	0	3	0	3	0		
11:15	3	0	1	0	4	0	4	1	0	0	4	1	4	1		
11:30	8	0	0	0	8	0	3	0	2	0	5	0	5	0		
11:45	5	0	2	0	7	0	2	1	3	1	5	2	5	2		
Total	41	101	17	69	58	170	69	116	47	123	116	239				
Day Total	142	86	228	185	170	355										
% Total	18.0%	44.3%	7.5%	30.3%	19.4%	32.7%	13.2%	34.6%								
Peak Vol.	-	11:00	00:30	10:15	12:00	11:00	12:00	-	07:30	02:15	07:30	03:45	07:30	02:15		
P.H.F.	-	0.563	0.643	0.500	0.542	0.719	0.625	-	0.781	0.781	0.800	0.675	0.854	0.691		



TMS Site 43732: Traffic Monitoring Report

Location Description: On Winchester Rd, Between Crackersport Rd and Valley Dr

Details		Location		Map
Type of Count	VOLUME	County	LEHIGH (39)	
Type of Site	Portable	Route	Q025	
Schedule	1 TIME/YR	Segment	0010	
Duration	24 HRS	Offset	0050	
Frequency Cycle	05	Latitude	40.60385	
Cycle Year	05	Longitude	-75.55701	

Traffic Data ↓

Timeframe: [All Years](#) / Jun 13, 2018

Hourly Traffic for Jun 13, 2018

Lane: [All Lanes](#) /

Hour	Volume	Volume Graph
12:00 AM	3	<div style="width: 3px; height: 10px; background-color: blue;"></div>
01:00 AM	1	<div style="width: 1px; height: 10px; background-color: blue;"></div>
02:00 AM	1	<div style="width: 1px; height: 10px; background-color: blue;"></div>
03:00 AM	0	
04:00 AM	2	<div style="width: 2px; height: 10px; background-color: blue;"></div>
05:00 AM	2	<div style="width: 2px; height: 10px; background-color: blue;"></div>
06:00 AM	15	<div style="width: 15px; height: 10px; background-color: blue;"></div>
07:00 AM	47	<div style="width: 47px; height: 10px; background-color: blue;"></div>
08:00 AM	25	<div style="width: 25px; height: 10px; background-color: blue;"></div>
09:00 AM	21	<div style="width: 21px; height: 10px; background-color: blue;"></div>
10:00 AM	12	<div style="width: 12px; height: 10px; background-color: blue;"></div>
11:00 AM	28	<div style="width: 28px; height: 10px; background-color: blue;"></div>
12:00 PM	31	<div style="width: 31px; height: 10px; background-color: blue;"></div>
01:00 PM	20	<div style="width: 20px; height: 10px; background-color: blue;"></div>
02:00 PM	50	<div style="width: 50px; height: 10px; background-color: blue;"></div>
03:00 PM	31	<div style="width: 31px; height: 10px; background-color: blue;"></div>
04:00 PM	28	<div style="width: 28px; height: 10px; background-color: blue;"></div>
05:00 PM	43	<div style="width: 43px; height: 10px; background-color: blue;"></div>
06:00 PM	27	<div style="width: 27px; height: 10px; background-color: blue;"></div>
07:00 PM	14	<div style="width: 14px; height: 10px; background-color: blue;"></div>
08:00 PM	11	<div style="width: 11px; height: 10px; background-color: blue;"></div>
09:00 PM	8	<div style="width: 8px; height: 10px; background-color: blue;"></div>
10:00 PM	2	<div style="width: 2px; height: 10px; background-color: blue;"></div>
11:00 PM	0	



TMS Site 29034: Traffic Monitoring Report

Location Description: On Springhouse Rd between Trexler Blvd and Highland St

Details		Location		Map
Type of Count	VOLUME	County	LEHIGH (39)	
Type of Site	Portable	Route	A035	
Schedule	1 TIME/YR	Segment	0030	
Duration	24 HRS	Offset	0675	
Frequency Cycle	05	Latitude	40.60356	
Cycle Year	05	Longitude	-75.54575	

Traffic Data ↓

Timeframe: [All Years](#) / July 11, 2018

Hourly Traffic for July 11, 2018

Lane: [All Lanes](#) /

Hour	Volume	Volume Graph
12:00 AM	27	<div style="width: 27px; height: 10px; background-color: #0070C0;"></div>
01:00 AM	20	<div style="width: 20px; height: 10px; background-color: #0070C0;"></div>
02:00 AM	5	<div style="width: 5px; height: 10px; background-color: #0070C0;"></div>
03:00 AM	13	<div style="width: 13px; height: 10px; background-color: #0070C0;"></div>
04:00 AM	18	<div style="width: 18px; height: 10px; background-color: #0070C0;"></div>
05:00 AM	64	<div style="width: 64px; height: 10px; background-color: #0070C0;"></div>
06:00 AM	258	<div style="width: 258px; height: 10px; background-color: #0070C0;"></div>
07:00 AM	530	<div style="width: 530px; height: 10px; background-color: #0070C0;"></div>
08:00 AM	672	<div style="width: 672px; height: 10px; background-color: #0070C0;"></div>
09:00 AM	513	<div style="width: 513px; height: 10px; background-color: #0070C0;"></div>
10:00 AM	554	<div style="width: 554px; height: 10px; background-color: #0070C0;"></div>
11:00 AM	652	<div style="width: 652px; height: 10px; background-color: #0070C0;"></div>
12:00 PM	752	<div style="width: 752px; height: 10px; background-color: #0070C0;"></div>
01:00 PM	615	<div style="width: 615px; height: 10px; background-color: #0070C0;"></div>
02:00 PM	633	<div style="width: 633px; height: 10px; background-color: #0070C0;"></div>
03:00 PM	759	<div style="width: 759px; height: 10px; background-color: #0070C0;"></div>
04:00 PM	816	<div style="width: 816px; height: 10px; background-color: #0070C0;"></div>
05:00 PM	867	<div style="width: 867px; height: 10px; background-color: #0070C0;"></div>
06:00 PM	583	<div style="width: 583px; height: 10px; background-color: #0070C0;"></div>
07:00 PM	433	<div style="width: 433px; height: 10px; background-color: #0070C0;"></div>
08:00 PM	342	<div style="width: 342px; height: 10px; background-color: #0070C0;"></div>
09:00 PM	241	<div style="width: 241px; height: 10px; background-color: #0070C0;"></div>
10:00 PM	100	<div style="width: 100px; height: 10px; background-color: #0070C0;"></div>
11:00 PM	59	<div style="width: 59px; height: 10px; background-color: #0070C0;"></div>

Traffic Planning & Design

2500 E. High Street
Pottstown, PA 19464

Springhouse Road Volume

Site Code:
Station ID:

Latitude: 40° 36.2096 North

Start Time	05-Jan-21 Tue	SB		NB		Combined		06-Jan Wed	SB		NB		Combined		
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	
12:00	*	60		*	68	*	128		1	58	3	68	4	126	
12:15	*	73		*	57	*	130		1	59	1	77	2	136	
12:30	*	73		*	51	*	124		1	60	0	85	1	145	
12:45	*	61		*	78	*	139		0	67	0	57	0	124	
01:00	*	76		*	52	*	128		0	57	0	70	0	127	
01:15	*	72		*	82	*	154		0	62	0	64	0	126	
01:30	*	46		*	63	*	109		1	70	0	69	1	139	
01:45	*	71		*	77	*	148		0	68	1	59	1	127	
02:00	*	94		*	88	*	182		1	53	1	58	2	111	
02:15	*	100		*	85	*	185		0	68	0	61	0	129	
02:30	*	96		*	67	*	163		3	92	0	83	3	175	
02:45	*	107		*	76	*	183		0	76	0	85	0	161	
03:00	*	79		*	119	*	198		0	88	1	100	1	188	
03:15	*	73		*	108	*	181		0	82	0	90	0	172	
03:30	*	69		*	95	*	164		0	68	0	87	0	155	
03:45	*	85		*	98	*	183		0	67	1	107	1	174	
04:00	*	87		*	109	*	196		1	95	1	109	2	204	
04:15	*	78		*	95	*	173		1	66	2	99	3	165	
04:30	*	89		*	98	*	187		6	79	2	91	8	170	
04:45	*	87		*	94	*	181		6	65	2	88	8	153	
05:00	*	70		*	92	*	162		9	70	1	87	10	157	
05:15	*	75		*	77	*	152		7	57	2	74	9	131	
05:30	*	53		*	62	*	115		20	49	4	87	24	136	
05:45	*	47		*	61	*	108		12	50	6	55	18	105	
06:00	*	34		*	61	*	95		15	46	9	47	24	93	
06:15	*	54		*	49	*	103		39	46	12	41	51	87	
06:30	*	27		*	51	*	78		39	30	15	27	54	57	
06:45	*	39		*	48	*	87		39	34	30	35	69	69	
07:00	*	30		*	41	*	71		43	27	39	36	82	63	
07:15	*	31		*	34	*	65		42	22	43	33	85	55	
07:30	*	25		*	20	*	45		46	31	36	20	82	51	
07:45	*	30		*	25	*	55		57	22	52	24	109	46	
08:00	*	12		*	28	*	40		48	11	49	31	97	42	
08:15	*	18		*	17	*	35		67	19	50	14	117	33	
08:30	*	14		*	9	*	23		63	16	48	12	111	28	
08:45	*	13		*	17	*	30		50	15	55	16	105	31	
09:00	*	10		*	12	*	22		53	13	36	13	89	26	
09:15	*	10		*	5	*	15		50	10	38	9	88	19	
09:30	*	5		*	15	*	20		41	8	49	6	90	14	
09:45	*	11		*	5	*	16		39	7	62	11	101	18	
10:00		48	8		42	10	90	18		64	6	55	5	119	11
10:15		48	6		44	6	92	12		62	8	53	10	115	18
10:30		47	8		47	11	94	19		71	5	55	6	126	11
10:45		60	6		54	3	114	9		66	1	68	8	134	9
11:00		42	2		63	8	105	10		68	3	52	10	120	13
11:15		50	1		43	9	93	10		57	1	67	7	124	8
11:30		77	1		68	4	145	5		61	1	70	4	131	5
11:45		60	1		55	4	115	5		72	1	72	8	144	9
Total		432	2217	416	2444	848	4661		1322	2009	1143	2343	2465	4352	
Day Total		2649		2860		5509			3331		3486		6817		
% Total		7.8%	40.2%	7.6%	44.4%				19.4%	29.5%	16.8%	34.4%			
Peak	-	10:45	02:00	11:00	03:00	11:00	03:45	-	10:15	02:30	11:00	03:45	11:00	03:45	
Vol.	-	229	397	229	420	458	739	-	267	338	261	406	519	713	
P.H.F.		0.744	0.928	0.842	0.882	0.790	0.933		0.940	0.918	0.906	0.931	0.901	0.874	

Traffic Planning & Design

2500 E. High Street
Pottstown, PA 19464

Springhouse Road Volume

Site Code:
Station ID:

Latitude: 40° 36.2096 North

Start Time	07-Jan-21		SB		NB		Combined		08-Jan		SB		NB		Combined	
	Thu		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Fri		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00			0	65	2	53	2	118			2	64	0	70	2	134
12:15			2	62	0	59	2	121			2	70	2	73	4	143
12:30			0	66	0	80	0	146			2	106	3	79	5	185
12:45			0	75	0	54	0	129			1	62	0	76	1	138
01:00			1	72	0	69	1	141			0	54	0	76	0	130
01:15			1	62	1	65	2	127			1	67	3	79	4	146
01:30			0	64	0	72	0	136			0	75	2	69	2	144
01:45			0	66	0	88	0	154			0	84	1	82	1	166
02:00			0	69	0	82	0	151			0	64	0	89	0	153
02:15			0	101	2	62	2	163			1	103	0	68	1	171
02:30			0	106	0	92	0	198			1	110	0	84	1	194
02:45			2	97	0	95	2	192			3	114	1	83	4	197
03:00			1	92	2	103	3	195			1	103	0	125	1	228
03:15			0	62	2	95	2	157			1	85	0	102	1	187
03:30			2	99	0	79	2	178			0	94	2	110	2	204
03:45			0	84	1	120	1	204			0	78	1	100	1	178
04:00			0	112	2	104	2	216			1	78	0	107	1	185
04:15			2	89	3	112	5	201			1	84	1	96	2	180
04:30			5	79	4	112	9	191			5	78	2	108	7	186
04:45			3	84	1	96	4	180			3	58	0	80	3	138
05:00			9	96	0	112	9	208			8	69	0	91	8	160
05:15			9	70	6	83	15	153			9	73	5	86	14	159
05:30			15	64	7	77	22	141			16	66	3	66	19	132
05:45			11	47	4	73	15	120			13	46	2	60	15	106
06:00			15	32	10	60	25	92			13	55	5	60	18	115
06:15			38	31	17	39	55	70			35	40	15	62	50	102
06:30			39	41	21	31	60	72			39	52	23	43	62	95
06:45			39	32	34	48	73	80			40	31	33	42	73	73
07:00			47	39	57	30	104	69			40	30	68	34	108	64
07:15			78	27	86	24	164	51			71	33	92	33	163	66
07:30			86	19	60	28	146	47			97	26	58	36	155	62
07:45			68	20	57	27	125	47			63	24	52	29	115	53
08:00			72	28	31	28	103	56			60	19	52	34	112	53
08:15			57	18	54	13	111	31			69	18	39	28	108	46
08:30			68	13	40	24	108	37			56	17	46	19	102	36
08:45			58	16	52	12	110	28			42	23	50	22	92	45
09:00			60	14	40	10	100	24			46	8	48	13	94	21
09:15			48	18	46	11	94	29			40	16	36	13	76	29
09:30			59	13	56	7	115	20			41	16	41	11	82	27
09:45			41	8	58	12	99	20			43	14	63	10	106	24
10:00			45	10	47	8	92	18			58	12	43	11	101	23
10:15			35	7	43	12	78	19			63	12	49	10	112	22
10:30			43	10	40	8	83	18			53	8	63	8	116	16
10:45			50	1	53	6	103	7			65	6	64	8	129	14
11:00			40	3	70	9	110	12			53	3	53	9	106	12
11:15			44	4	37	4	81	8			57	8	53	10	110	18
11:30			68	0	66	6	134	6			66	4	59	3	125	7
11:45			57	0	51	4	108	4			75	3	68	5	143	8
Total			1318	2287	1163	2498	2481	4785			1356	2363	1201	2612	2557	4975
Day Total			3605		3661		7266				3719		3813		7532	
% Total			18.1%	31.5%	16.0%	34.4%					18.0%	31.4%	15.9%	34.7%		
Peak	-		07:15	02:15	07:00	03:45	07:00	03:45	-		07:15	02:15	07:00	03:00	07:15	02:45
Vol.	-		304	396	260	448	539	812	-		291	430	270	437	545	816
P.H.F.			0.884	0.934	0.756	0.933	0.822	0.940			0.750	0.943	0.734	0.874	0.836	0.895

Traffic Planning & Design

2500 E. High Street
Pottstown, PA 19464

Springhouse Road Volume

Site Code:
Station ID:

Latitude: 40° 36.2096 North

Start Time	09-Jan-21 Sat		SB		NB		Combined		10-Jan Sun		SB		NB		Combined	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	2	62	3	72	5	134			5	57	4	67	9	124		
12:15	3	61	3	66	6	127			1	61	4	57	5	118		
12:30	2	60	3	72	5	132			2	58	3	79	5	137		
12:45	0	72	2	59	2	131			1	52	1	55	2	107		
01:00	4	59	2	66	6	125			2	62	2	56	4	118		
01:15	3	53	0	59	3	112			0	40	0	62	0	102		
01:30	0	52	1	74	1	126			0	54	0	64	0	118		
01:45	0	69	3	67	3	136			0	59	0	55	0	114		
02:00	1	66	3	70	4	136			0	53	0	58	0	111		
02:15	3	77	0	64	3	141			1	58	1	55	2	113		
02:30	1	53	4	54	5	107			0	70	0	61	0	131		
02:45	2	64	1	55	3	119			2	45	1	62	3	107		
03:00	0	63	1	82	1	145			1	41	1	63	2	104		
03:15	2	56	0	64	2	120			0	55	0	54	0	109		
03:30	1	65	0	62	1	127			0	58	2	53	2	111		
03:45	1	64	0	59	1	123			1	53	0	49	1	102		
04:00	1	68	0	70	1	138			0	45	1	57	1	102		
04:15	1	55	1	61	2	116			0	45	0	48	0	93		
04:30	1	49	0	73	1	122			0	47	0	48	0	95		
04:45	0	57	0	47	0	104			1	50	0	44	1	94		
05:00	1	43	2	55	3	98			3	39	2	51	5	90		
05:15	4	59	2	47	6	106			0	46	1	40	1	86		
05:30	7	47	0	51	7	98			5	33	0	36	5	69		
05:45	3	55	1	58	4	113			1	30	1	40	2	70		
06:00	2	38	4	41	6	79			5	24	3	24	8	48		
06:15	11	37	4	29	15	66			5	31	2	22	7	53		
06:30	12	26	4	28	16	54			9	22	3	25	12	47		
06:45	11	27	8	27	19	54			9	16	5	29	14	45		
07:00	6	16	6	24	12	40			7	21	7	14	14	35		
07:15	7	20	10	20	17	40			8	18	14	14	22	32		
07:30	17	15	13	21	30	36			12	19	13	18	25	37		
07:45	25	21	20	18	45	39			16	22	11	21	27	43		
08:00	25	20	15	21	40	41			23	19	15	19	38	38		
08:15	27	21	15	16	42	37			24	13	7	14	31	27		
08:30	18	22	13	16	31	38			24	9	17	14	41	23		
08:45	29	12	24	9	53	21			25	8	19	9	44	17		
09:00	43	12	27	16	70	28			26	9	19	10	45	19		
09:15	42	15	32	17	74	32			22	4	24	8	46	12		
09:30	57	12	45	11	102	23			28	6	30	4	58	10		
09:45	43	12	44	6	87	18			38	5	30	10	68	15		
10:00	55	9	44	5	99	14			30	9	38	6	68	15		
10:15	51	8	49	5	100	13			40	4	38	1	78	5		
10:30	51	7	59	5	110	12			35	7	45	8	80	15		
10:45	73	5	60	5	133	10			47	3	35	3	82	6		
11:00	55	4	64	9	119	13			39	2	52	6	91	8		
11:15	64	8	66	6	130	14			57	1	44	6	101	7		
11:30	61	4	51	6	112	10			61	2	42	2	103	4		
11:45	66	3	75	3	141	6			63	4	45	6	108	10		
Total	894	1803	784	1871	1678	3674			679	1489	582	1607	1261	3096		
Day Total	2697		2655		5352				2168		2189		4357			
% Total	16.7%	33.7%	14.6%	35.0%					15.6%	34.2%	13.4%	36.9%				
Peak	-	10:45	01:45	11:00	01:30	11:00	01:30	-	11:00	01:45	11:00	12:00	11:00	12:00		
Vol.	-	253	265	256	275	502	539	-	220	240	183	258	403	486		
P.H.F.		0.866	0.860	0.853	0.929	0.890	0.956		0.873	0.857	0.880	0.816	0.933	0.887		

Traffic Planning & Design

2500 E. High Street
Pottstown, PA 19464

Springhouse Road Volume

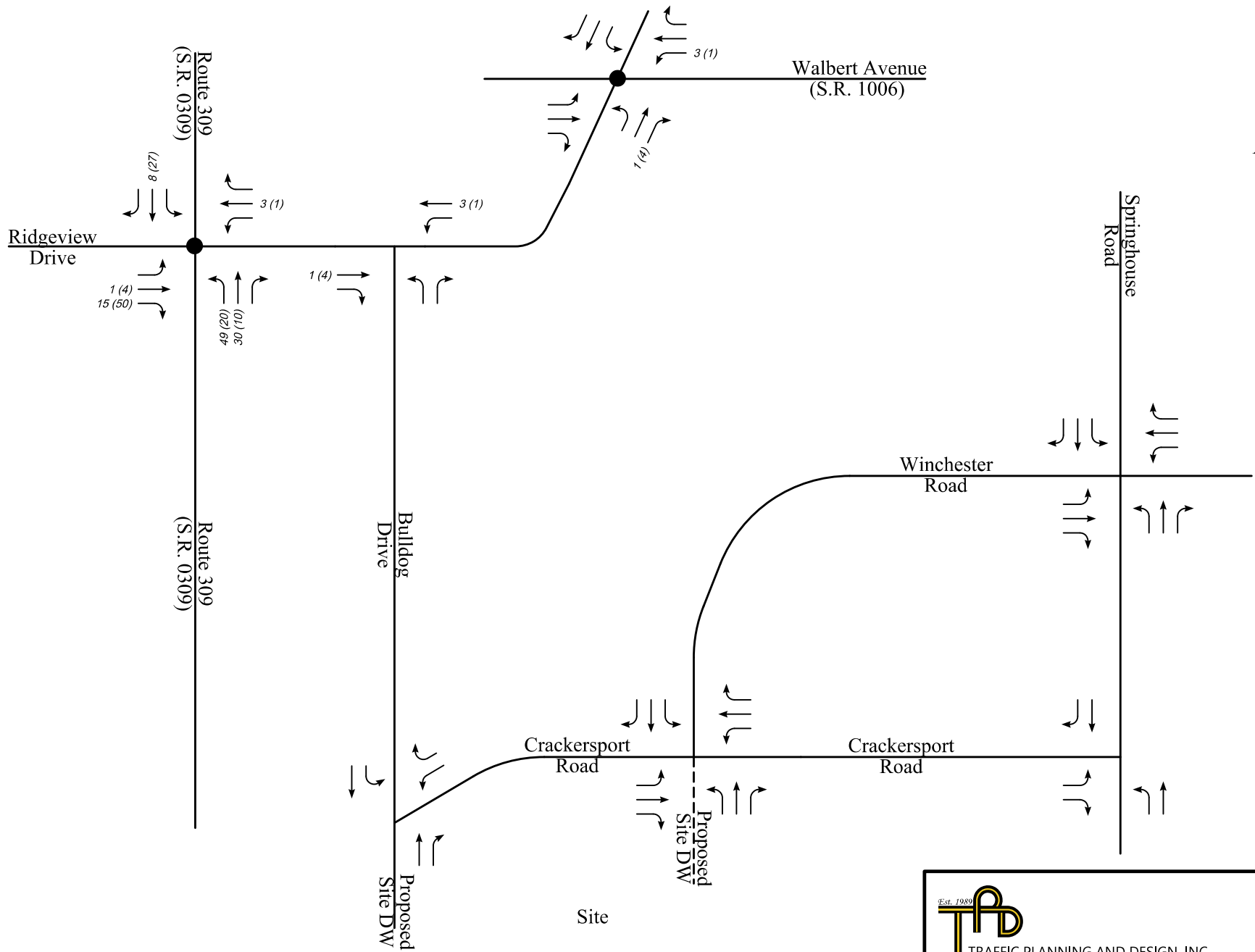
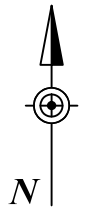
Site Code:
Station ID:

Latitude: 40° 36.2096 North

Start Time	11-Jan-21		SB		NB		Combined		12-Jan		SB		NB		Combined	
	Mon		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Tue		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00			1	70	0	63	1	133			2	86	3	67	5	153
12:15			1	61	1	66	2	127			1	65	3	74	4	139
12:30			2	66	1	54	3	120			0	68	0	74	0	142
12:45			1	60	2	71	3	131			2	61	1	69	3	130
01:00			1	75	4	56	5	131			1	72	1	57	2	129
01:15			2	57	0	82	2	139			0	46	1	71	1	117
01:30			0	70	1	83	1	153			0	62	0	67	0	129
01:45			0	65	0	87	0	152			0	69	1	74	1	143
02:00			0	70	1	76	1	146			0	74	1	85	1	159
02:15			1	111	1	80	2	191			0	117	0	94	0	211
02:30			0	93	0	55	0	148			1	123	1	90	2	213
02:45			2	112	1	93	3	205			2	110	1	98	3	208
03:00			0	93	0	105	0	198			1	114	2	124	3	238
03:15			0	70	0	77	0	147			0	95	1	100	1	195
03:30			0	89	0	100	0	189			1	77	0	93	1	170
03:45			2	69	1	93	3	162			1	109	0	110	1	219
04:00			0	82	1	97	1	179			0	99	0	113	0	212
04:15			3	69	1	99	4	168			1	79	1	96	2	175
04:30			4	77	3	89	7	166			6	66	2	118	8	184
04:45			2	63	2	76	4	139			0	77	0	88	0	165
05:00			9	58	0	95	9	153			10	88	3	112	13	200
05:15			5	69	3	79	8	148			7	73	2	76	9	149
05:30			13	54	6	75	19	129			11	58	5	60	16	118
05:45			12	42	3	62	15	104			15	55	1	51	16	106
06:00			13	46	13	56	26	102			20	47	7	63	27	110
06:15			33	43	19	43	52	86			36	44	20	49	56	93
06:30			37	41	26	39	63	80			31	40	23	44	54	84
06:45			39	32	34	40	73	72			34	36	34	31	68	67
07:00			49	37	32	32	119	69			45	31	64	29	109	60
07:15			86	20	83	27	169	47			83	19	114	37	197	56
07:30			90	23	56	17	146	40			95	22	45	33	140	55
07:45			59	19	65	22	124	41			69	19	49	37	118	56
08:00			73	12	32	26	105	38			63	22	40	29	103	51
08:15			54	10	47	21	101	31			62	25	42	15	104	40
08:30			61	14	50	14	111	28			60	18	49	13	109	31
08:45			50	15	46	11	96	26			59	12	57	13	116	25
09:00			69	13	58	10	127	23			52	12	55	11	107	23
09:15			45	8	46	4	91	12			56	6	48	12	104	18
09:30			50	10	59	6	109	16			47	7	43	14	90	21
09:45			48	5	55	6	103	11			59	9	59	6	118	15
10:00			49	8	36	3	85	11			40	9	46	4	86	13
10:15			56	9	53	6	109	15			47	5	44	9	91	14
10:30			46	6	48	6	94	12			56	10	54	10	110	20
10:45			52	3	58	7	110	10			41	3	49	2	90	5
11:00			54	3	62	6	116	9			58	1	41	13	99	14
11:15			75	2	68	6	143	8			60	3	70	6	130	9
11:30			79	2	62	2	141	4			70	0	66	4	136	4
11:45			65	1	51	3	116	4			57	2	44	3	101	5
Total			1393	2127	1229	2326	2622	4453			1362	2345	1193	2548	2555	4893
Day Total			3520		3555		7075				3707		3741		7448	
% Total			19.7%	30.1%	17.4%	32.9%					18.3%	31.5%	16.0%	34.2%		
Peak	-		07:15	02:15	07:00	03:30	07:00	02:15	-		07:15	02:15	07:00	03:45	07:00	02:15
Vol.	-		308	409	274	389	558	742	-		310	464	272	437	564	870
P.H.F.			0.856	0.913	0.825	0.926	0.825	0.905			0.816	0.943	0.596	0.926	0.716	0.914

APPENDIX E:

Nearby Developments

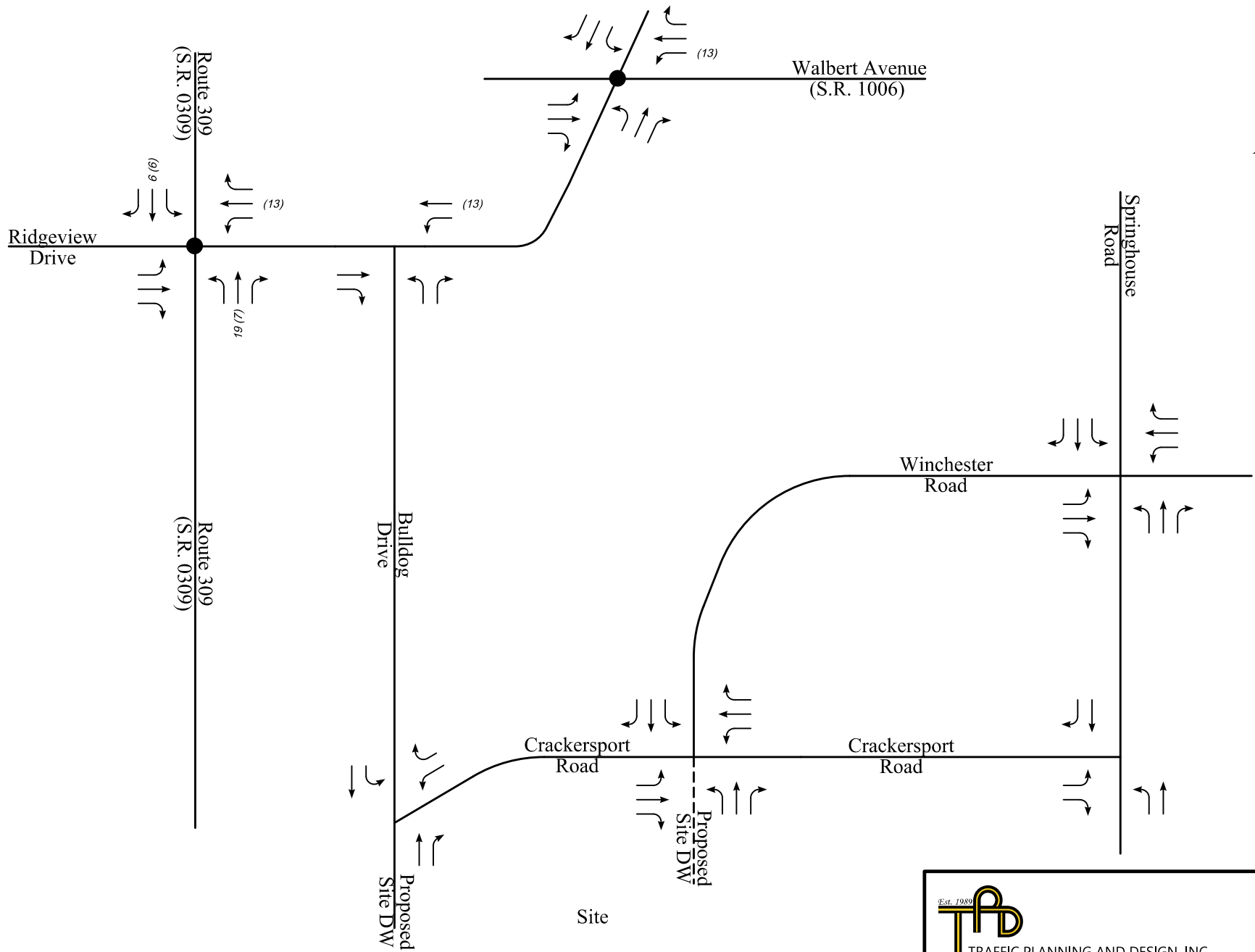
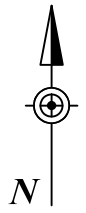


KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE


TPD
Est. 1989
 TRAFFIC PLANNING AND DESIGN, INC.
 www.TrafficPD.com | 610.326.3100 | TPD@TrafficPD.com

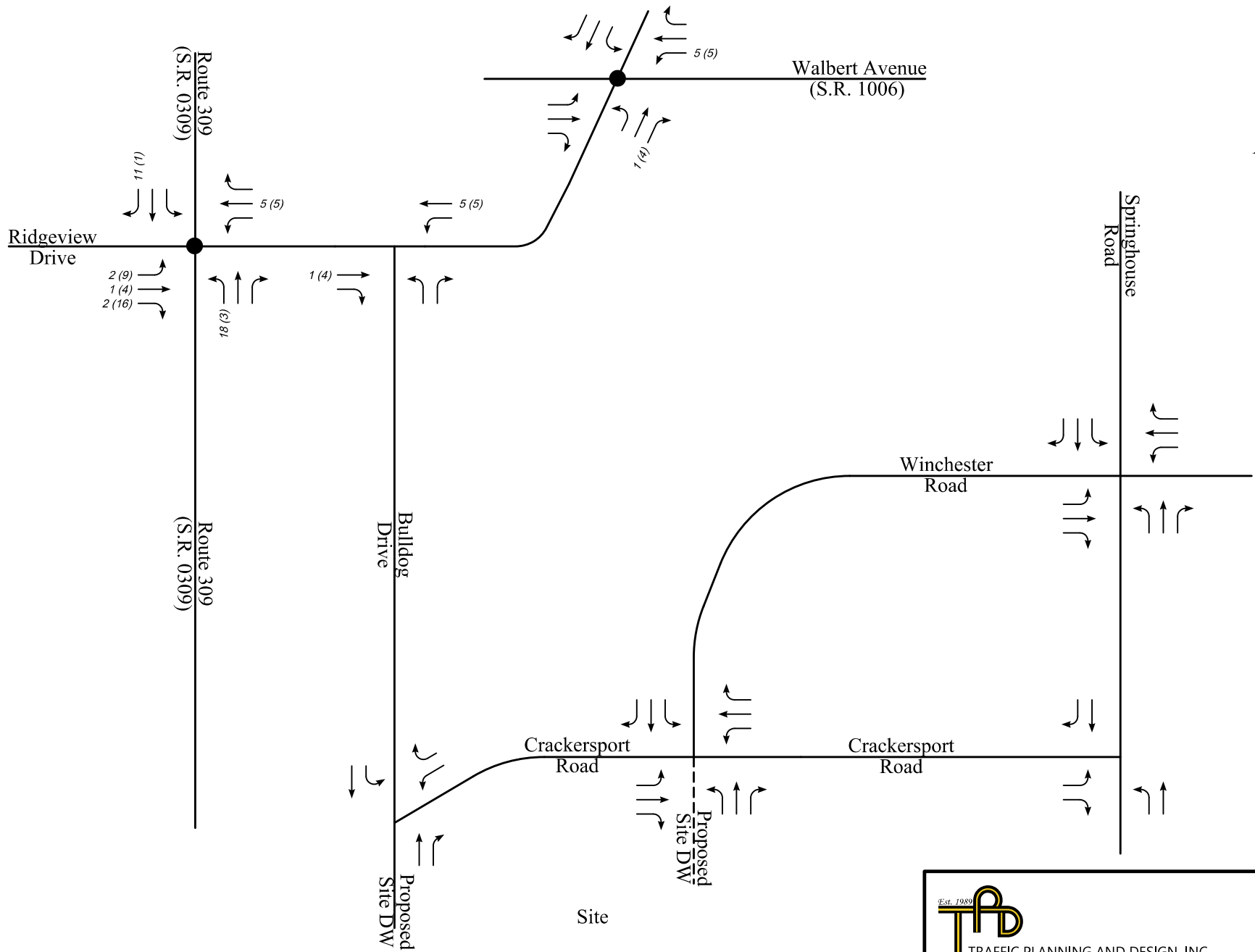
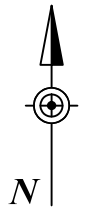
FIGURE E1

NEARBY DEVELOPMENT
 WEEKDAY A.M. (P.M.) PEAK HOURS
 CRACKERSPORT ROAD DC
 NEARBY TRIPS



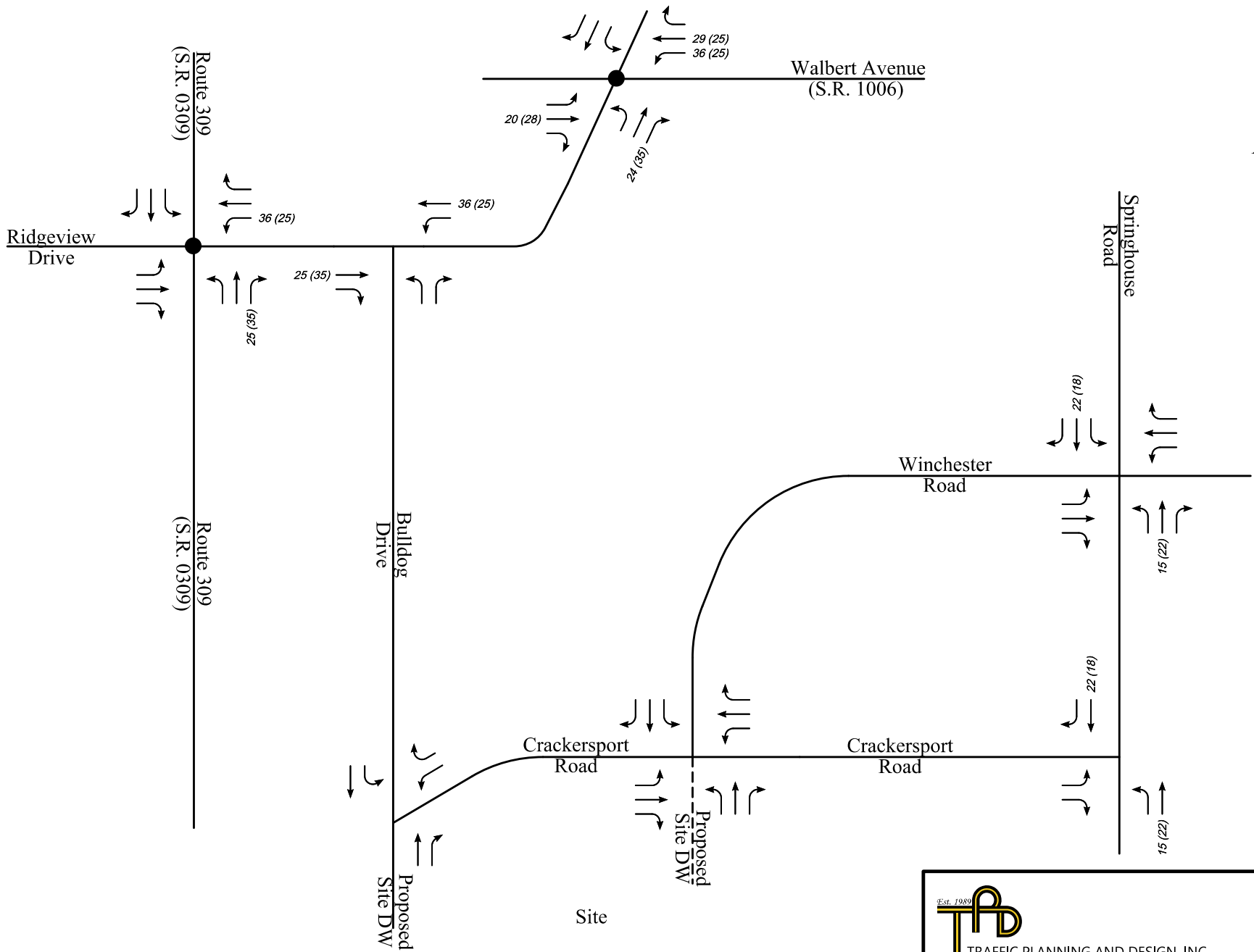
KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

 TRAFFIC PLANNING AND DESIGN, INC. www.TrafficPD.com 610.326.3100 TPD@TrafficPD.com	FIGURE E2
	NEARBY DEVELOPMENT WEEKDAY A.M. (P.M.) PEAK HOURS 4741 CHAPMANS ROAD NEARBY TRIPS



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE


 TRAFFIC PLANNING AND DESIGN, INC. www.TrafficPD.com 610.326.3100 TPD@TrafficPD.com	FIGURE E4
	NEARBY DEVELOPMENT WEEKDAY A.M. (P.M.) PEAK HOURS 1215 HAUSMAN ROAD NEARBY TRIPS

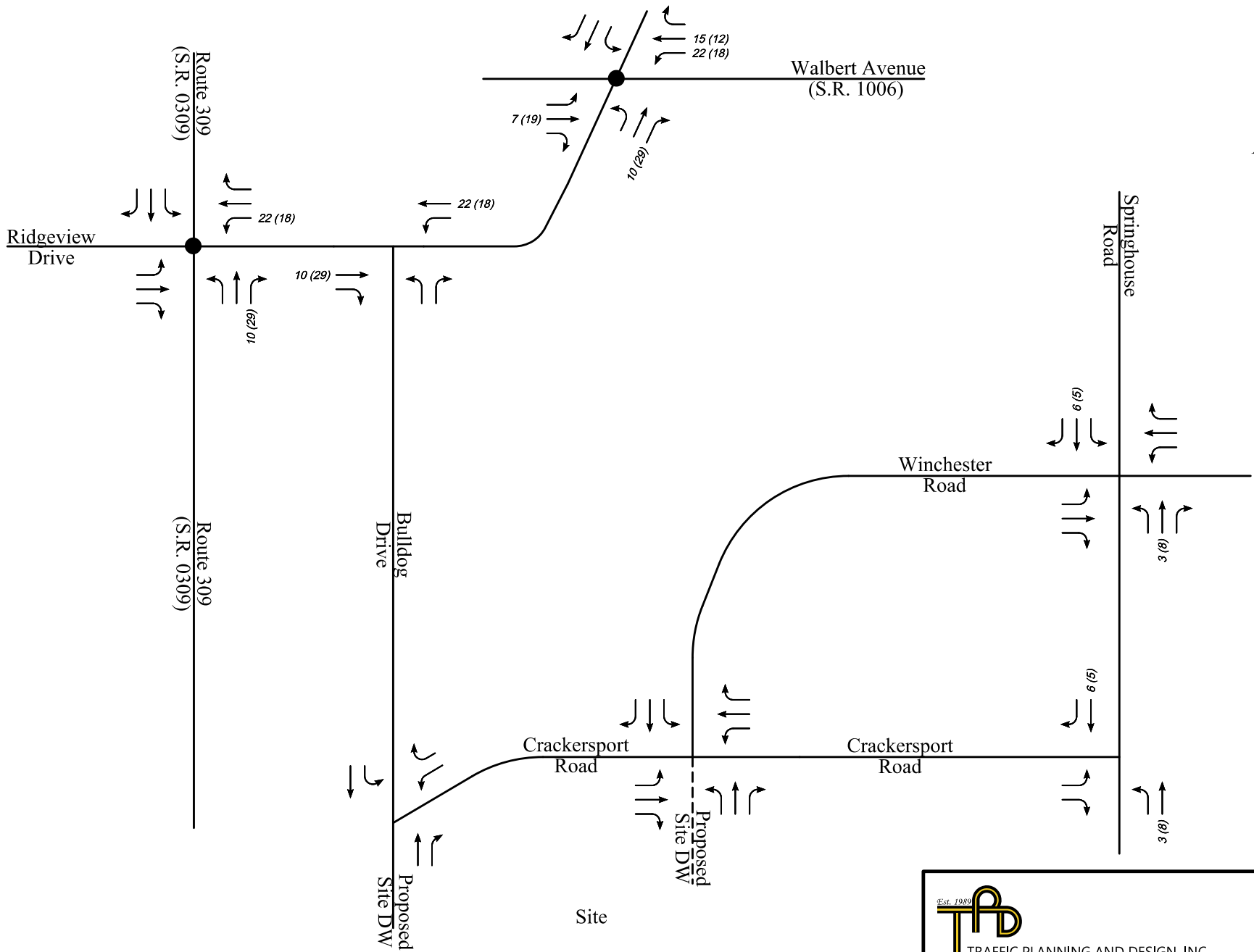
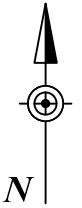


KEY:


----- PROPOSED DRIVEWAY

SCHEMATIC DRAWING: NOT TO SCALE

 <p>TRAFFIC PLANNING AND DESIGN, INC. www.TrafficPD.com 610.326.3100 TPD@TrafficPD.com</p>	FIGURE E5
	NEARBY DEVELOPMENT WEEKDAY A.M. (P.M.) PEAK HOURS RIDGE FARM NEARBY TRIPS



KEY:
 - - - - - PROPOSED DRIVEWAY
 SCHEMATIC DRAWING: NOT TO SCALE

 TRAFFIC PLANNING AND DESIGN, INC. www.TrafficPD.com 610.326.3100 TPD@TrafficPD.com	FIGURE E6
	NEARBY DEVELOPMENT WEEKDAY A.M. (P.M.) PEAK HOURS REGENCY AT SOUTH WHITEHALL NEARBY TRIPS

Trip Generation of Day Care Centers

Preston W. Hitchens, Jr. (S)^a

INTRODUCTION

This research paper will provide additional insight into the trip making characteristics of day care centers in the metropolitan Philadelphia, Pennsylvania area. Data was collected at six operating day care centers in New Jersey and in Pennsylvania, and analyzed in several areas. The major focus of this work is directed towards trip generation, however peak parking demand, as well as average time parked during the morning and evening peak hours, was reviewed at two centers. Interviews were conducted at two centers during the evening rush hour to determine additional information about site related trips.

METHODOLOGY

Traffic data was collected at six operating day care centers in the metropolitan Philadelphia, Pennsylvania area. The locations of the centers were as follows:

Voorhees, New Jersey (2 centers)
Sewell, New Jersey
Moorestown, New Jersey
North Wales, Pennsylvania
Plymouth Meeting, Pennsylvania

Traffic counters monitored driveway activity at each of the above centers during a typical weekday of operation. In order to minimize parental anxiety, the vehicle used by the traffic counter was signed "Traffic Count" and all management staff at each center were briefed as to the purpose of the data collection. All six locations studied were located in commercial areas. Two centers were located near major employment centers, with the other four accessing heavily traveled roadways.

All of the centers required that an adult accompany children into the facility in the morning, where typically, the child was signed in by the parent. In the afternoon the parent was required to enter the day care center and sign out his or her child.

All of the six centers studied had an outdoor play area which was fenced, and located the maximum possible distance from the parking areas. Although the majority of enrollees were personally dropped off and picked up by parents, some of the centers had small omni-buses/vans (approximately 15 passenger) which picked up children at appropriate times from local schools. The buses were also utilized for field trips.

^a Project Engineer
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1600 Callowhill Street
Philadelphia, PA U.S.A. 19130

Typical weekday operating hours at each center (with minor variations) were from 6:30 A.M. to 6:00 P.M. Discussions with managers at the respective centers revealed that some day care centers are offering parents extended hours on Friday evenings to approximately 11:00 P.M., and in some cases, sleep-over opportunities, where the enrolled child would spend the night at the day care center. These programs are marketed to parents as an opportunity for social activity on their part without compromising the safety of their children. For the centers extended hours and/or "sleep overs" offer increased revenue for the center. In addition, centers located near major employment centers offered programming to encourage parents to spend lunch time with their children, such as hoagie sales, "Easter parades", etc.

SITE CHARACTERISTICS

The following data was collected at each survey location:

- Building area (square feet)
- Number of Parking Spaces
- Number of Children in Attendance
- Number of Employees in Attendance

Building areas of the centers varied from approximately 6,000 square feet to 8,400 square feet. Parking varied from 13-30 spaces at the study locations. Enrollment at the centers varied between 98-158 children, with between 9-26 employees on site.

TRIP GENERATION CHARACTERISTICS

The number of total trips during a typical weekday; and, during the morning and evening peak hours of each center was easily obtained from the traffic count information. Data at each location was analyzed with respect to number of enrolled children, gross building area in square feet, and number of employees at each center.

Linear regression analysis of total trip ends (T) vs. number of employees (E) on a typical weekday revealed the following relationship:

$$T = 15.41(E) + 103.68 \quad R^2 = 0.865$$

Similarly, analysis of total trip ends (T) vs. number of enrolled children (C) resulted in the following equation:

$$T = 3.67(C) - 62.89 \quad R^2 = 0.777$$

A comparison of total trip ends (T) vs. 1,000 square feet gross floor area (X) was modeled by the regression equation:

$$T = 65.78(X) - 98.33 \quad R^2 = 0.651$$

Given the relatively low correlation coefficients and/or the limited data base, the above equations should be used very cautiously in modeling day center operations.

The following average trip rates were observed by this study:

Average Weekday Vehicle Trip Ends

- 20.78 trips/employee
- 52.85 trips/1000 s.f. gross floor area
- 3.26 trips/enrolled child

The range of rates of trips/employee varied from 17.90 trips/employee to 28.12 trips/employee. With respect to trips/1000 square feet of gross floor area, the rates ranged from 42.61 trips/1000 s.f. to 67.50 trips/1000 s.f. The range of rates of trips/enrolled child varied between 1.9 trips/enrolled child to 3.75 trips/child.

The following average trip rates were observed during the A.M. and P.M. peak hours of the generator:

A.M. Peak Hour of Generator

- 4.09 trips/employee
- 0.64 trips/enrollee
- 10.42 trips/1000 s.f. gross floor area

P.M. Peak Hour of Generator

- 4.12 trips/employee
- 0.65 trips/enrollee
- 10.50 trips/1000 s.f. gross floor area

In addition to determining average trip rates for several dependent variables, the average hourly variation of day care center traffic for the locations studied was determined.

Average Hourly Variation of Day Care Center Traffic

Hour Ending:	Percentage of Trips
7:00 A.M.	3%
8:00 A.M.	16%
9:00 A.M.	16%
10:00 A.M.	8%
11:00 A.M.	2%
12:00 NOON	4%
1:00 P.M.	5%
2:00 P.M.	3%
3:00 P.M.	4%
4:00 P.M.	6%
5:00 P.M.	12%
6:00 P.M.	19%

PARENTS' INTERVIEWS

In order to gain additional insight into the trip making characteristics of day care centers, interviews of parents were conducted during the P.M. peak hour at two locations. Parents were asked where their trip had begun, where it would end, and its approximate length. Parents were also asked as to whether or not they would have "passed by" the day care center in their normal home/work commute. The following are the results of our interviews:

Trip Origination:

- 28% --home
- 72% --work

Trip Destination:

- 68% --directly home
- 32% --elsewhere

Type of Trip:

- 24% --primary trip (home to center to home)
- 44% --pass-by trip (from work to home)
- 32% --diverted trip (from work to home)

Trip Length:

- < 1 mile: 20%
- 1-2 miles: 16%
- 2-5 miles: 4%
- 5-10 miles: 44%
- > 10 miles: 16%

Number of Children at Center:

- 1 child: 68%
- 2 children: 32%

PARKING CHARACTERISTICS

Although the primary emphasis of this study was trip generation of day care centers, parking data was collected at two facilities. Peak parking rates were observed, as well as length of time parked during the morning and evening peak hours. The average peak parking rate was found to be 2.36 spaces/1000 square feet gross floor area. Parents parked an average of 5.6 minutes during the morning peak period and 6.8 minutes during the evening peak. Additional parking data should be collected on day care centers.

CONCLUSIONS

This paper has reviewed trip making characteristics of six operating day care centers in the Philadelphia, Pennsylvania area. The traffic count data was analyzed with respect to the number of employees, the number of enrolled children, and the square feet of gross floor area at each center.

Equations, obtained by linear regression analysis, are presented relating total trip ends vs. the number of employees, total trip ends vs. the number of enrolled children and total trip ends vs. the square feet of gross floor area at each center. In addition, average trip rates are developed for daily trips, A.M. peak hour of generator trips and P.M. peak hour of generator trips.

A comparison of the average trip rates determined by this study; and those published in Trip Generation, (4th Edition, Institute of Transportation Engineers, 1987) shows some differences. The rates

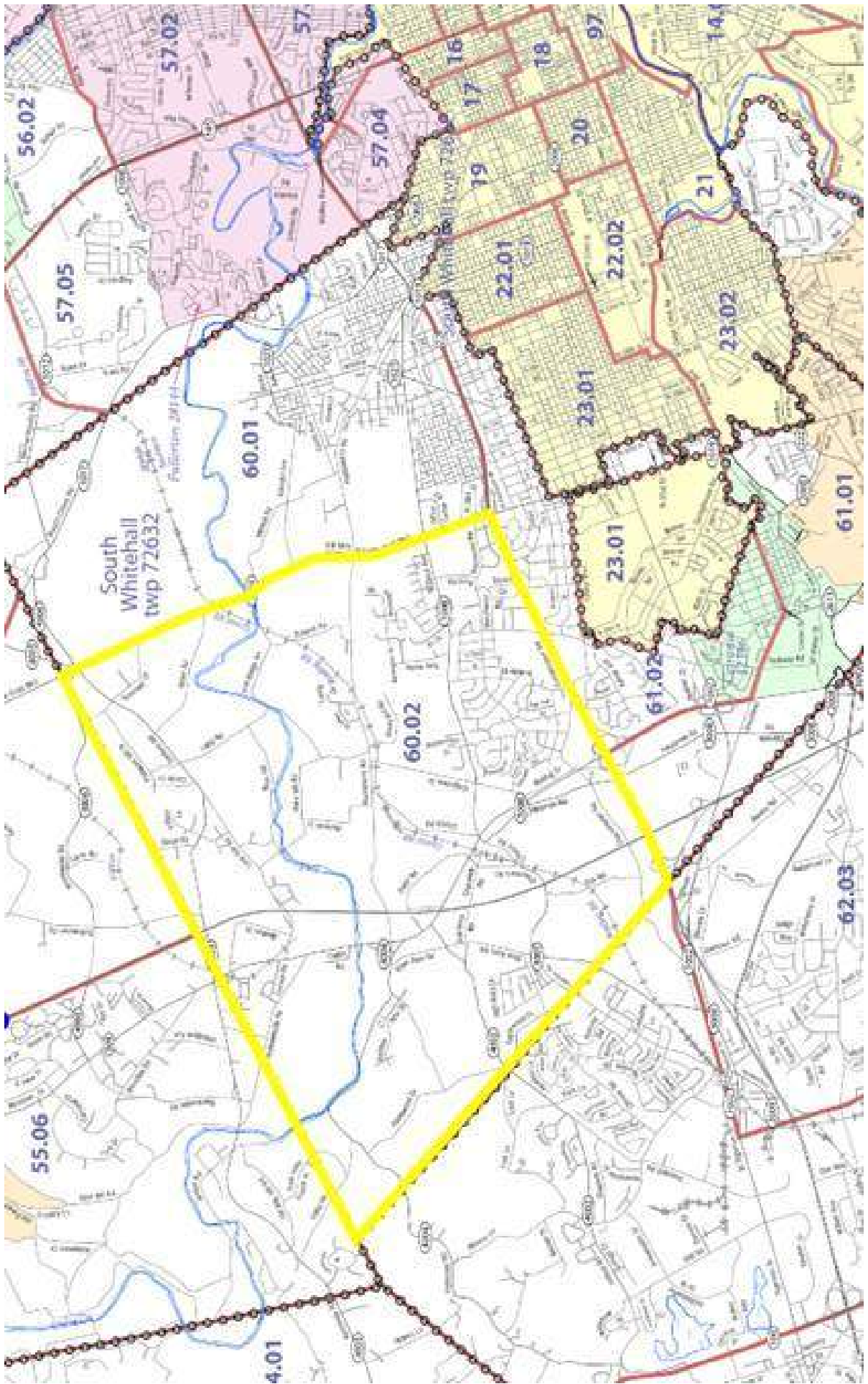
presented for trips/employee by this study are approximately 55% lower than that presented in Trip Generation. The average trip rate presented for trips/1000 s.f. gross floor area were well within ITE range. The differences in the average trip rates determined by this study are most likely attributable to differences in regulations pertaining to day care throughout the country. It is recommended that additional studies be done in the Philadelphia, Pennsylvania area and elsewhere to further supplement the data base on this land use code.

APPENDIX F:

Volume Development Worksheets

	Location	Number of Jobs	Trip Distribution Assumptions for Jobs Located in Each Municipality					Route 309 North	Walbert Ave East
			Route 22 East	Route 22 West	Springhouse Rd South	Route 309 South			
Lehigh County	Allentown City	459	30%		25%	15%		30%	
	South Whitehall Township	313			30%	5%	20%	25%	
	Upper Macungie Township	205		50%	25%	25%			
	Salisbury Township	156				100%			
	Lower Macungie Township	78			25%	75%			
	Bethlehem City	75	100%						
	North Whitehall Township	69					75%	25%	
	Whitehall Township	61	50%					50%	
	Upper Saucon Township	50				100%			
	Emmaus Borough	48				100%			
	Fountain Hill Borough	39				100%			
	Hanover Township	34	100%						
	Weisenberg Township	19		100%					
	Heidelberg Township	13					100%		
Upper Milford Township	11				100%				
Catasauqua Borough	8	75%					25%		
Other Counties	Northampton County, PA	311	75%			5%		20%	
	Montgomery County, PA	168		100%					
	Philadelphia County, PA	80		100%					
	Bucks County, PA	71		50%		50%			
	Berks County, PA	68		100%					
	Delaware County, PA	43		100%					
	Chester County, PA	42		100%					
	Dauphin County, PA	29		100%					
Monroe County, PA	26		100%						
	Total	2476							

	Location	Total % of Jobs	Percentage of Total Site Trips Assigned to Each Route					Route 309 North	Walbert Ave East
			Route 22 East	Route 22 West	Springhouse Rd South	Route 309 South			
Lehigh County	Allentown City	19%	6%	0%	5%	3%	0%	6%	
	South Whitehall Township	13%	0%	0%	4%	1%	3%	3%	
	Upper Macungie Township	8%	0%	4%	2%	2%	0%	0%	
	Salisbury Township	6%	0%	0%	0%	6%	0%	0%	
	Lower Macungie Township	3%	0%	0%	1%	2%	0%	0%	
	Bethlehem City	3%	3%	0%	0%	0%	0%	0%	
	North Whitehall Township	3%	0%	0%	0%	0%	2%	1%	
	Whitehall Township	2%	1%	0%	0%	0%	0%	1%	
	Upper Saucon Township	2%	0%	0%	0%	2%	0%	0%	
	Emmaus Borough	2%	0%	0%	0%	2%	0%	0%	
	Fountain Hill Borough	2%	0%	0%	0%	2%	0%	0%	
	Hanover Township	1%	1%	0%	0%	0%	0%	0%	
	Weisenberg Township	1%	0%	1%	0%	0%	0%	0%	
	Heidelberg Township	1%	0%	0%	0%	0%	1%	0%	
Upper Milford Township	0%	0%	0%	0%	0%	0%	0%		
Catasauqua Borough	0%	0%	0%	0%	0%	0%	0%		
Other Counties	Northampton County, PA	13%	9%	0%	0%	1%	0%	3%	
	Montgomery County, PA	7%	0%	7%	0%	0%	0%	0%	
	Philadelphia County, PA	3%	0%	3%	0%	0%	0%	0%	
	Bucks County, PA	3%	0%	1%	0%	1%	0%	0%	
	Berks County, PA	3%	0%	3%	0%	0%	0%	0%	
	Delaware County, PA	2%	0%	2%	0%	0%	0%	0%	
	Chester County, PA	2%	0%	2%	0%	0%	0%	0%	
Dauphin County, PA	1%	0%	1%	0%	0%	0%	0%		
Monroe County, PA	1%	0%	1%	0%	0%	0%	0%		
Total	Without Rounding	100%	21%	25%	11%	22%	5%	13%	
	With Rounding	100%	20%	25%	10%	20%	5%	15%	



TPD# BOYC.0003
 1/19/2021
 Traffic Volumes Worksheet
 Intersection:
 Synchro Node:

Route 309 (S.R. 0309) & Ridgeview Drive									
1	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	6	2	43	368	32	15	226	617	561	11	881	24	2786
Balancing													0
Covid-19 Adjustment													
Existing Volumes (Balanced)	6	2	43	368	32	15	226	617	561	11	881	24	2786
Base growth (0.2% compounded for 3 yrs)	0	0	1	7	1	0	4	12	11	0	17	0	53
Crackersport Road DC		1	15		3		49	30			8		106
4741 Chapmans Road								19			6		25
Parkway Manor - Phase 4	1	3	7		3		16					1	
1215 Hausman Road	2	1	2	0	5	0	18					11	39
Ridge Farm Full Buildout				36						25			
Hills at Winchester				22						10			
2025 Base Volumes	9	7	68	433	44	15	313	678	607	11	912	36	3009

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter		5%							55%	5%			
Residential Trip Assignment % - Exit				55%	5%	5%							
Retail New Assignment % - Enter		5%							15%	5%			
Retail New Assignment % - Exit				15%	5%	5%							
Retail Pass-By Assignment % - Enter													
Retail Pass-By Assignment % - Exit													

Residential Trips	0	2	0	50	5	5	0	0	19	2	0	0	
Retail New Trips	0	6	0	12	4	4	0	0	19	6	0	0	
Total New Site Trips	0	8	0	62	9	9	0	0	38	8	0	0	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	0	8	0	62	9	9	0	0	38	8	0	0	
2025 Projected Volumes	9	15	68	495	53	24	313	678	645	19	912	36	3267

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	11	60	189	232	23	10	305	693	635	16	702	7	2883
Balancing													0
Covid-19 Adjustment													
Existing Volumes (Balanced)	11	60	189	232	23	10	305	693	635	16	702	7	2883
Base growth (0.2% compounded for 3 yrs)	0	1	4	4	0	0	6	13	12	0	13	0	53
Crackersport Road DC		4	50		1		20	10			27		112
4741 Chapmans Road					13			7			6		26
Parkway Manor - Phase 4	1	12	14		1		24					1	
1215 Hausman Road	9	4	16		5		3					1	38
Ridge Farm Full Buildout				25						35			
Hills at Winchester				18						29			
2025 Base Volumes	21	81	273	279	43	10	358	723	711	16	748	9	3112

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	5%	0%	0%	0%	0%	0%	0%	55%	5%	0%	0%	
Residential Trip Assignment % - Exit	0%	0%	0%	55%	5%	5%	0%	0%	0%	0%	0%	0%	
Retail New Assignment % - Enter	0%	5%	0%	0%	0%	0%	0%	0%	15%	5%	0%	0%	
Retail New Assignment % - Exit	0%	0%	0%	15%	5%	5%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Residential Trips	0	5	0	27	2	2	0	0	58	5	0	0	
Retail New Trips	0	4	0	15	5	5	0	0	12	4	0	0	
Total New Site Trips	0	9	0	42	7	7	0	0	70	9	0	0	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	0	9	0	42	7	7	0	0	70	9	0	0	
2025 Projected Volumes	21	90	273	321	50	17	358	723	781	25	748	9	3416

TPD# BOYC.0003
1/19/2021
Traffic Volumes Worksheet

Intersection:
Synchro Node:

Ridgeview Drive & Bulldog Drive									
2	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts		122	97	6	227		63		1				516
Balancing		198	157		97		28						480
Covid-19 Adjustment				2					0				
Existing Volumes (Balanced)	0	320	254	8	324	0	91	0	1	0	0	0	998
Base growth (0.2% compounded for 3 yrs)	0	6	5	0	6	0	2	0	0	0	0	0	19
Crackersport Road DC		1			3								4
4741 Chapmans Road		0			0								0
Parkway Manor - Phase 4		3			3								
1215 Hausman Road		1			5								6
Ridge Farm Full Buildout		25			36								
Hills at Winchester		10			22								
2025 Base Volumes	0	366	259	8	399	0	93	0	1	0	0	0	1027

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter			65%										
Residential Trip Assignment % - Exit							65%						
Retail New Assignment % - Enter			25%										
Retail New Assignment % - Exit							25%						
Retail Pass-By Assignment % - Enter													
Retail Pass-By Assignment % - Exit													

Residential Trips	0	0	23	0	0	0	60	0	0	0	0	0	
Retail New Trips	0	0	31	0	0	0	20	0	0	0	0	0	
Total New Site Trips	0	0	54	0	0	0	80	0	0	0	0	0	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	0	0	54	0	0	0	80	0	0	0	0	0	
2025 Projected Volumes	0	366	313	8	399	0	173	0	1	0	0	0	1260

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	1	397	44	4	186		64		5				701
Balancing		243	27		11		4						285
Covid-19 Adjustment				1					1				
Existing Volumes (Balanced)	1	640	71	5	197	0	68	0	6	0	0	0	988
Base growth (0.2% compounded for 3 yrs)	0	12	1	0	4	0	1	0	0	0	0	0	18
Crackersport Road DC		4			1								5
4741 Chapmans Road		0			13								13
Parkway Manor - Phase 4		12			1								
1215 Hausman Road		4			5								9
Ridge Farm Full Buildout		35			25								
Hills at Winchester		29			18								
2025 Base Volumes	1	736	72	5	264	0	69	0	6	0	0	0	1033

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	0%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Residential Trip Assignment % - Exit	0%	0%	0%	0%	0%	0%	65%	0%	0%	0%	0%	0%	
Retail New Assignment % - Enter	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail New Assignment % - Exit	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Residential Trips	0	0	68	0	0	0	31	0	0	0	0	0	
Retail New Trips	0	0	20	0	0	0	25	0	0	0	0	0	
Total New Site Trips	0	0	88	0	0	0	56	0	0	0	0	0	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	0	0	88	0	0	0	56	0	0	0	0	0	
2025 Projected Volumes	1	736	160	5	264	0	125	0	6	0	0	0	1297

TPD# BOYC.0003
 1/19/2021
 Traffic Volumes Worksheet
 Intersection:
 Synchro Node:

Walbert Avenue & Ridgeview Drive									
3	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	10	225	6	165	169	10	17	53	181	10	126	12	984
Balancing													0
Covid-19 Adjustment													
Existing Volumes (Balanced)	10	225	6	165	169	10	17	53	181	10	126	12	984
Base growth (0.2% compounded for 3 yrs)	0	4	0	3	3	0	0	1	3	0	2	0	16
Crackersport Road DC				3					1				4
4741 Chapmans Road				0					0				0
Parkway Manor - Phase 4				3					3				
1215 Hausman Road				5					1				6
Ridge Farm Full Buildout		20		36	29				24				
Hills at Winchester		7		22	15				10				
2025 Base Volumes	10	256	6	237	216	10	17	54	223	10	128	12	1010

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter													
Residential Trip Assignment % - Exit													
Retail New Assignment % - Enter													
Retail New Assignment % - Exit													
Retail Pass-By Assignment % - Enter													
Retail Pass-By Assignment % - Exit													

Residential Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Retail New Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total New Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	
2025 Projected Volumes	10	256	6	237	216	10	17	54	223	10	128	12	1179

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	17	245	8	135	266	38	17	277	249	16	30	3	1301
Balancing													0
Covid-19 Adjustment													
Existing Volumes (Balanced)	17	245	8	135	266	38	17	277	249	16	30	3	1301
Base growth (0.2% compounded for 3 yrs)	0	5	0	3	5	1	0	5	5	0	1	0	25
Crackersport Road DC				1					4				5
4741 Chapmans Road				13					0				13
Parkway Manor - Phase 4				1					12				
1215 Hausman Road				5					4				9
Ridge Farm Full Buildout		28		25	25				35				
Hills at Winchester		19		18	12				29				
2025 Base Volumes	17	297	8	201	308	39	17	282	338	16	31	3	1353

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Residential Trip Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail New Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail New Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Residential Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Retail New Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total New Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	0	0	0	0	0	0	0	0	0	0	0	0	
2025 Projected Volumes	17	297	8	201	308	39	17	282	338	16	31	3	1557

TPD# BOYC.0003
 1/19/2021
 Traffic Volumes Worksheet
 Intersection:
 Synchro Node:

Bulldog Drive & Crakersport Road									
4	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts		78	5	2	39		10		1				135
Balancing													0
Covid-19 Adjustment		21	1	1	11		3		0				
Existing Volumes (Balanced)	0	99	6	3	50	0	13	0	1	0	0	0	172
Base growth (0.2% compounded for 3 yrs)	0	2	0	0	1	0	0	0	0	0	0	0	3
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													
1215 Hausman Road													0
Ridge Farm Full Buildout													
Hills at Winchester													
2025 Base Volumes	0	101	6	3	51	0	13	0	1	0	0	0	175

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter			65%										
Residential Trip Assignment % - Exit							65%						
Retail New Assignment % - Enter			25%										
Retail New Assignment % - Exit							25%						
Retail Pass-By Assignment % - Enter		-38%	38%										
Retail Pass-By Assignment % - Exit								38%					

Residential Trips	0	0	23	0	0	0	60	0	0	0	0	0	
Retail New Trips	0	0	31	0	0	0	20	0	0	0	0	0	
Total New Site Trips	0	0	54	0	0	0	80	0	0	0	0	0	
Retail Pass-by Trips	0	-8	8	0	0	0	0	0	8	0	0	0	
Total Site Trips	0	-8	62	0	0	0	80	0	8	0	0	0	
2025 Projected Volumes	0	93	68	3	51	0	93	0	9	0	0	0	317

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts		40	11	3	35		18		3				110
Balancing													0
Covid-19 Adjustment		8	2	1	7		4		1				
Existing Volumes (Balanced)	0	48	13	4	42	0	22	0	4	0	0	0	133
Base growth (0.2% compounded for 3 yrs)	0	1	0	0	1	0	0	0	0	0	0	0	2
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													
1215 Hausman Road													0
Ridge Farm Full Buildout													
Hills at Winchester													
2025 Base Volumes	0	49	13	4	43	0	22	0	4	0	0	0	135

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	0%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Residential Trip Assignment % - Exit	0%	0%	0%	0%	0%	0%	65%	0%	0%	0%	0%	0%	
Retail New Assignment % - Enter	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail New Assignment % - Exit	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Enter	0%	-40%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%	

Residential Trips	0	0	68	0	0	0	31	0	0	0	0	0	
Retail New Trips	0	0	20	0	0	0	25	0	0	0	0	0	
Total New Site Trips	0	0	88	0	0	0	56	0	0	0	0	0	
Retail Pass-by Trips	0	-9	9	0	0	0	0	0	9	0	0	0	
Total Site Trips	0	-9	97	0	0	0	56	0	9	0	0	0	
2025 Projected Volumes	0	40	110	4	43	0	78	0	13	0	0	0	288

TPD# BOYC.0003
 1/19/2021
 Traffic Volumes Worksheet
 Intersection:
 Synchro Node:

Crakersport Road & Winchester Road / Proposed Driveway									
5	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	3	28			22	9				10		10	82
Balancing													0
Covid-19 Adjustment	1	8	0	0	6	2	0	0	0	3	0	3	
Existing Volumes (Balanced)	4	36	0	0	28	11	0	0	0	13	0	13	105
Base growth (0.2% compounded for 3 yrs)	0	1	0	0	1	0	0	0	0	0	0	0	2
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													
1215 Hausman Road													0
Ridge Farm Full Buildout													
Hills at Winchester													
2025 Base Volumes	4	37	0	0	29	11	0	0	0	13	0	13	107

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter				15%								20%	
Residential Trip Assignment % - Exit								20%	15%				
Retail New Assignment % - Enter				40%								35%	
Retail New Assignment % - Exit								35%	40%				
Retail Pass-By Assignment % - Enter				38%	-27%	-11%						-12%	24%
Retail Pass-By Assignment % - Exit							39%	11%	12%				-12%

Residential Trips	0	0	0	5	0	0	0	18	14	0	6	0	
Retail New Trips	0	0	0	50	0	0	0	28	32	0	43	0	
Total New Site Trips	0	0	0	55	0	0	0	46	46	0	49	0	
Retail Pass-by Trips	0	0	0	8	-6	-2	9	2	3	-3	6	-3	
Total Site Trips	0	0	0	63	-6	-2	9	48	49	-3	55	-3	
2025 Projected Volumes	4	37	0	63	23	9	9	48	49	10	55	10	317

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	6	34			37	10				9		3	99
Balancing													0
Covid-19 Adjustment	1	7	0	0	8	2	0	0	0	2	0	1	
Existing Volumes (Balanced)	7	41	0	0	45	12	0	0	0	11	0	4	120
Base growth (0.2% compounded for 3 yrs)	0	1	0	0	1	0	0	0	0	0	0	0	2
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													
1215 Hausman Road													0
Ridge Farm Full Buildout													
Hills at Winchester													
2025 Base Volumes	7	42	0	0	46	12	0	0	0	11	0	4	122

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	20%	0%	
Residential Trip Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	20%	15%	0%	0%	0%	
Retail New Assignment % - Enter	0%	0%	0%	40%	0%	0%	0%	0%	0%	0%	35%	0%	
Retail New Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	35%	40%	0%	0%	0%	
Retail Pass-By Assignment % - Enter				47%	-37%	-10%					-10%	13%	-3%
Retail Pass-By Assignment % - Exit							40%	10%	10%				

Residential Trips	0	0	0	16	0	0	0	10	7	0	21	0	
Retail New Trips	0	0	0	35	0	0	0	33	37	0	30	0	
Total New Site Trips	0	0	0	51	0	0	0	43	44	0	51	0	
Retail Pass-by Trips	0	0	0	11	-9	-2	10	2	2	-2	3	-1	
Total Site Trips	0	0	0	62	-9	-2	10	45	46	-2	54	-1	
2025 Projected Volumes	7	42	0	62	37	10	10	45	46	9	54	3	325

TPD# BOYC.0003
 1/19/2021
 Traffic Volumes Worksheet
 Intersection:
 Synchro Node:

Crakersport Road & Springhouse Road									
6	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	6		70				104	231			244	38	693
Balancing													0
Covid-19 Adjustment	2	0	19	0	0	0	28	62	0	0	66	10	
Existing Volumes (Balanced)	8	0	89	0	0	0	132	293	0	0	310	48	880
Base growth (0.2% compounded for 3 yrs)	0	0	2	0	0	0	3	6	0	0	6	1	18
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													0
1215 Hausman Road													0
Ridge Farm Full Buildout								15			22		
Hills at Winchester								3			6		
2025 Base Volumes	8	0	91	0	0	0	135	317	0	0	344	49	898

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter							10%						5%
Residential Trip Assignment % - Exit	5%		10%										
Retail New Assignment % - Enter							30%						10%
Retail New Assignment % - Exit	10%		30%										
Retail Pass-By Assignment % - Enter													
Retail Pass-By Assignment % - Exit													

Residential Trips	5	0	9	0	0	0	3	0	0	0	0	0	2
Retail New Trips	8	0	24	0	0	0	37	0	0	0	0	0	13
Total New Site Trips	13	0	33	0	0	0	40	0	0	0	0	0	15
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Site Trips	13	0	33	0	0	0	40	0	0	0	0	0	15
2025 Projected Volumes	21	0	124	0	0	0	175	317	0	0	344	64	1045

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	10		44				38	395			375	19	881
Balancing													0
Covid-19 Adjustment	2	0	9	0	0	0	8	83	0	0	79	4	
Existing Volumes (Balanced)	12	0	53	0	0	0	46	478	0	0	454	23	1066
Base growth (0.2% compounded for 3 yrs)	0	0	1	0	0	0	1	9	0	0	9	0	20
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													0
1215 Hausman Road													0
Ridge Farm Full Buildout								22			18		
Hills at Winchester								8			5		
2025 Base Volumes	12	0	54	0	0	0	47	517	0	0	486	23	1086

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	5%
Residential Trip Assignment % - Exit	5%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Retail New Assignment % - Enter	0%	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	10%
Retail New Assignment % - Exit	10%	0%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Retail Pass-By Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Retail Pass-By Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Residential Trips	2	0	5	0	0	0	11	0	0	0	0	0	5
Retail New Trips	9	0	28	0	0	0	26	0	0	0	0	0	9
Total New Site Trips	11	0	33	0	0	0	37	0	0	0	0	0	14
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Site Trips	11	0	33	0	0	0	37	0	0	0	0	0	14
2025 Projected Volumes	23	0	87	0	0	0	84	517	0	0	486	37	1234

TPD# BOYC.0003
1/19/2021
Traffic Volumes Worksheet

Intersection:

Springhouse Road & Winchester Road									
7	Adjacent intersections:	West	2	East	0	North	0	South	5

Time Period: Weekday A.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	10	43	14	61	20	9	9	106	96	10	240	5	623
Balancing													0
Covid-19 Adjustment	3	12	4	16	5	2	2	29	26	3	65	1	
Existing Volumes (Balanced)	13	55	18	77	25	11	11	135	122	13	305	6	791
Base growth (0.2% compounded for 3 yrs)	0	1	0	1	0	0	0	3	2	0	6	0	13
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													0
1215 Hausman Road													0
Ridge Farm Full Buildout								15			22		
Hills at Winchester								3			6		
2025 Base Volumes	13	56	18	78	25	11	11	156	124	13	339	6	804

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	34				124	22	158	22
EXIT =	92				80	22	172	22

Residential Trip Assignment % - Enter					10%						5%	5%	
Residential Trip Assignment % - Exit	5%	10%						5%			0%	0%	
Retail New Assignment % - Enter					5%						10%	10%	
Retail New Assignment % - Exit	10%	5%						10%					
Retail Pass-By Assignment % - Enter													
Retail Pass-By Assignment % - Exit													

Residential Trips	5	9	0	0	3	0	0	5	0	0	2	2	
Retail New Trips	8	4	0	0	6	0	0	8	0	0	13	12	
Total New Site Trips	13	13	0	0	9	0	0	13	0	0	15	14	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	13	13	0	0	9	0	0	13	0	0	15	14	
2025 Projected Volumes	26	69	18	78	34	11	11	169	124	13	354	20	927

Time Period: Weekday P.M. Peak Hour

	Eastbound			Westbound			Northbound			Southbound			Intersection Volume
	left	thru	right	left	thru	right	left	thru	right	left	thru	right	
2020 Existing Counts	5	34	9	162	53	38	25	270	104	11	196	6	913
Balancing													0
Covid-19 Adjustment	1	7	2	34	11	8	5	57	22	2	41	1	
Existing Volumes (Balanced)	6	41	11	196	64	46	30	327	126	13	237	7	1104
Base growth (0.2% compounded for 3 yrs)	0	1	0	4	1	1	1	6	2	0	5	0	21
Crackersport Road DC													0
4741 Chapmans Road													0
Parkway Manor - Phase 4													0
1215 Hausman Road													0
Ridge Farm Full Buildout								22			18		
Hills at Winchester								8			5		
2025 Base Volumes	6	42	11	200	65	47	31	363	128	13	265	7	1125

	Residential		xxxx		Retail		Total	
	New	P-By	New	P-By	New	P-By	New	P-By
ENTER =	105				85	23	190	23
EXIT =	48				95	23	143	23

Residential Trip Assignment % - Enter	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	5%	5%	
Residential Trip Assignment % - Exit	5%	10%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	
Retail New Assignment % - Enter	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	10%	10%	
Retail New Assignment % - Exit	10%	5%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Enter	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Retail Pass-By Assignment % - Exit	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

Residential Trips	3	5	0	0	11	0	0	2	0	0	5	5	
Retail New Trips	9	5	0	0	4	0	0	9	0	0	9	9	
Total New Site Trips	12	10	0	0	15	0	0	11	0	0	14	14	
Retail Pass-by Trips	0	0	0	0	0	0	0	0	0	0	0	0	
Total Site Trips	12	10	0	0	15	0	0	11	0	0	14	14	
2025 Projected Volumes	18	52	11	200	80	47	31	374	128	13	279	21	1254

APPENDIX G:

Capacity Analyses

Existing Conditions

1: S.R. 309 & Ridgeview Drive

Timing Plan: AM Peak Hour

Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	2	43	368	32	15	226	617	561	11	881	24
Future Volume (vph)	6	2	43	368	32	15	226	617	561	11	881	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	12	12	12	12	11	11	12	11	11
Grade (%)		1%			-1%			4%			-4%	
Storage Length (ft)	50		60	210		0	225		0	225		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		276			148			1327			900	
Travel Time (s)		5.4			2.9			16.5			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	67%	0%	12%	8%	3%	13%	5%	14%	4%	0%	10%	17%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		15.0	15.0	
Minimum Split (s)	25.0	25.0	12.5	25.0	25.0		12.5	25.5		22.5	22.5	
Total Split (s)	33.0	33.0	21.5	33.0	33.0		21.5	57.0		35.5	35.5	
Total Split (%)	36.7%	36.7%	23.9%	36.7%	36.7%		23.9%	63.3%		39.4%	39.4%	
Yellow Time (s)	4.5	4.5	5.5	4.5	4.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.5	2.5	2.0	2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.5	6.0	6.0		6.5	6.5		6.5	6.5	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Max		Max	Max	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Natural Cycle: 90
 Control Type: Semi Act-Uncoord

Splits and Phases: 1: S.R. 309 & Ridgeview Drive



1: S.R. 309 & Ridgeview Drive

Timing Plan: AM Peak Hour

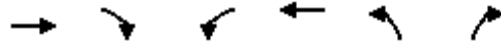
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	2	43	368	32	15	226	617	561	11	881	24
Future Volume (veh/h)	6	2	43	368	32	15	226	617	561	11	881	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	854	1794	1691	1724	1795	1652	1641	1514	1655	1949	1807	1707
Adj Flow Rate, veh/h	7	2	40	400	35	12	246	671	569	12	958	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	67	0	12	8	3	13	5	14	4	0	10	17
Cap, veh/h	267	538	618	477	383	131	342	833	698	176	1222	32
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.29	0.13	0.56	0.55	0.36	0.36	0.35
Sat Flow, veh/h	655	1794	1433	1327	1278	438	1562	1484	1245	494	3418	89
Grp Volume(v), veh/h	7	2	40	400	0	47	246	650	590	12	481	502
Grp Sat Flow(s),veh/h/ln	655	1794	1433	1327	0	1716	1562	1438	1290	494	1716	1791
Q Serve(g_s), s	0.7	0.1	1.5	26.9	0.0	1.8	8.1	32.6	33.5	1.8	22.5	22.5
Cycle Q Clear(g_c), s	2.0	0.1	1.5	27.0	0.0	1.8	8.1	32.6	33.5	16.5	22.5	22.5
Prop In Lane	1.00		1.00	1.00		0.26	1.00		0.96	1.00		0.05
Lane Grp Cap(c), veh/h	267	538	618	477	0	515	342	807	724	176	614	640
V/C Ratio(X)	0.03	0.00	0.06	0.84	0.00	0.09	0.72	0.81	0.81	0.07	0.78	0.78
Avail Cap(c_a), veh/h	267	538	618	477	0	515	397	807	724	176	614	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.2	22.1	15.0	31.6	0.0	22.8	18.0	15.8	16.4	30.0	25.8	25.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	12.5	0.0	0.1	5.2	8.4	9.8	0.7	9.7	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.1	0.8	15.1	0.0	1.3	5.1	15.4	14.9	0.4	14.8	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	22.1	15.0	44.1	0.0	22.8	23.3	24.2	26.2	30.7	35.5	35.1
LnGrp LOS	C	C	B	D	A	C	C	C	C	C	D	D
Approach Vol, veh/h		49			447			1486			995	
Approach Delay, s/veh		16.5			41.9			24.9			35.3	
Approach LOS		B			D			C			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	18.3	38.7		33.0		57.0		33.0				
Change Period (Y+Rc), s	7.5	7.5		7.0		7.5		7.0				
Max Green Setting (Gmax), s	14.0	28.0		26.0		49.5		26.0				
Max Q Clear Time (g_c+I1), s	10.6	25.0		4.5		35.5		29.5				
Green Ext Time (p_c), s	0.2	1.6		0.1		6.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				30.7								
HCM 6th LOS				C								

2: Bulldog Drive & Ridgeview Drive

Timing Plan: AM Peak Hour

Existing Conditions



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	320	254	8	324	91	1
Future Volume (vph)	320	254	8	324	91	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	10	13	10	10
Grade (%)	1%			-2%	1%	
Storage Length (ft)		0	120		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	148			414	1819	
Travel Time (s)	2.9			8.1	35.4	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	7%	12%	0%	5%	25%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary




Area Type: Other

Control Type: Unsignalized

2: Bulldog Drive & Ridgeview Drive

Timing Plan: AM Peak Hour

Existing Conditions

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	320	254	8	324	91	1
Future Vol, veh/h	320	254	8	324	91	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	120	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	-2	1	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	7	12	0	5	25	0
Mvmt Flow	364	289	9	368	103	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	653	0	711	509
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	-	-	4.3	-	6.9	6.3
Critical Hdwy Stg 1	-	-	-	-	5.975	-
Critical Hdwy Stg 2	-	-	-	-	6.375	-
Follow-up Hdwy	-	-	3	-	3.2	3.1
Pot Cap-1 Maneuver	-	-	713	-	388	589
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	859	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	713	-	382	589
Mov Cap-2 Maneuver	-	-	-	-	382	-
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	845	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	17.9			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	383	-	-	713	-	
HCM Lane V/C Ratio	0.273	-	-	0.013	-	
HCM Control Delay (s)	17.9	-	-	10.1	0.1	
HCM Lane LOS	C	-	-	B	A	
HCM 95th %tile Q(veh)	1.1	-	-	0	-	

3: Ridgeview Drive & Walbert Avenue

Timing Plan: AM Peak Hour

Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	225	6	165	169	10	17	53	181	10	126	12
Future Volume (vph)	10	225	6	165	169	10	17	53	181	10	126	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	14	14	14	14
Grade (%)		-3%			2%			7%			-4%	
Storage Length (ft)	85		0	125		0	0		275	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		931			1894			1185			805	
Travel Time (s)		14.1			28.7			23.1			15.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	10%	8%	0%	7%	10%	10%	6%	6%	3%	20%	0%	8%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	24.0	24.0		17.0	17.0		10.0	10.0	10.0	10.0	10.0	
Total Split (s)	39.0	39.0		39.0	39.0		21.0	21.0	21.0	21.0	21.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%	35.0%	35.0%	35.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	0.0			-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	

Intersection Summary
 Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 35.3
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated





















Splits and Phases: 3: Ridgeview Drive & Walbert Avenue



3: Ridgeview Drive & Walbert Avenue

Timing Plan: AM Peak Hour

Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	225	6	165	169	10	17	53	181	10	126	12
Future Volume (veh/h)	10	225	6	165	169	10	17	53	181	10	126	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1770	1798	1912	1679	1637	1637	1442	1442	1544	1731	2027	1909
Adj Flow Rate, veh/h	11	259	5	190	194	9	20	61	138	11	145	11
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	10	8	0	7	10	10	6	6	3	20	0	8
Cap, veh/h	670	735	14	610	649	30	201	221	205	151	337	25
Arrive On Green	0.42	0.42	0.38	0.42	0.42	0.38	0.16	0.19	0.16	0.16	0.19	0.16
Sat Flow, veh/h	1178	1758	34	1057	1552	72	217	1150	1308	79	1756	129
Grp Volume(v), veh/h	11	0	264	190	0	203	81	0	138	167	0	0
Grp Sat Flow(s),veh/h/ln	1178	0	1792	1057	0	1624	1367	0	1308	1964	0	0
Q Serve(g_s), s	0.2	0.0	2.8	4.1	0.0	2.4	0.0	0.0	2.8	0.5	0.0	0.0
Cycle Q Clear(g_c), s	2.0	0.0	2.8	6.5	0.0	2.4	1.4	0.0	2.8	2.1	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.04	0.25		1.00	0.07		0.07
Lane Grp Cap(c), veh/h	670	0	749	610	0	679	373	0	205	444	0	0
V/C Ratio(X)	0.02	0.00	0.35	0.31	0.00	0.30	0.22	0.00	0.67	0.38	0.00	0.00
Avail Cap(c_a), veh/h	1555	0	2095	1403	0	1899	861	0	695	1171	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.0	0.0	5.6	7.6	0.0	5.5	9.9	0.0	11.2	10.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.3	0.0	0.2	0.3	0.0	3.8	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	0.7	0.8	0.0	0.5	0.6	0.0	1.4	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.0	0.0	5.9	7.9	0.0	5.7	10.2	0.0	15.0	10.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		275			393			219			167	
Approach Delay, s/veh		5.9			6.8			13.2			10.7	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.8		10.4		17.8		10.4				
Change Period (Y+Rc), s		7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s		32.0		15.0		32.0		15.0				
Max Q Clear Time (g_c+I1), s		4.8		4.8		9.0		4.1				
Green Ext Time (p_c), s		1.4		0.6		1.9		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				8.5								
HCM 6th LOS				A								

4: Bulldog Drive & Crackersport Road

Timing Plan: AM Peak Hour





Existing Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↘	↘
Traffic Volume (vph)	99	6	3	50	13	1
Future Volume (vph)	99	6	3	50	13	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	14	11	15	13	13
Grade (%)	-3%			2%	3%	
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			35	25	
Link Distance (ft)	1819			992	325	
Travel Time (s)	49.6			19.3	8.9	
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Heavy Vehicles (%)	9%	0%	0%	15%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

4: Bulldog Drive & Crackersport Road

Timing Plan: AM Peak Hour

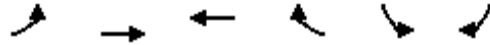
Existing Conditions

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	99	6	3	50	13	1
Future Vol, veh/h	99	6	3	50	13	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-3	-	-	2	3	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	9	0	0	15	0	0
Mvmt Flow	155	9	5	78	20	2
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	164	0	248	160
Stage 1	-	-	-	-	160	-
Stage 2	-	-	-	-	88	-
Critical Hdwy	-	-	4.3	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	1055	-	820	931
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	1075	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1055	-	816	931
Mov Cap-2 Maneuver	-	-	-	-	816	-
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	1070	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.5	9.5			
HCM LOS				A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	823	-	-	1055	-	
HCM Lane V/C Ratio	0.027	-	-	0.004	-	
HCM Control Delay (s)	9.5	-	-	8.4	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

5: Crackersport Road & Winchester Road

Timing Plan: AM Peak Hour

Existing Conditions



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (vph)	4	36	28	11	13	13
Future Volume (vph)	4	36	28	11	13	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	12	12
Grade (%)		0%	-1%		-2%	
Link Speed (mph)		35	35		25	
Link Distance (ft)		347	1175		531	
Travel Time (s)		6.8	22.9		14.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	33%	14%	27%	22%	0%	10%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary
 Area Type: Other
 Control Type: Unsignalized

5: Crackersport Road & Winchester Road

Timing Plan: AM Peak Hour













Existing Conditions

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	4	36	28	11	13	13
Future Vol, veh/h	4	36	28	11	13	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	-1	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	33	14	27	22	0	10
Mvmt Flow	4	39	30	12	14	14
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	42	0	-	0	83	36
Stage 1	-	-	-	-	36	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	4.6	-	-	-	6	6.1
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	3.3	-	-	-	3	3.2
Pot Cap-1 Maneuver	1054	-	-	-	1082	1075
Stage 1	-	-	-	-	1159	-
Stage 2	-	-	-	-	1146	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1054	-	-	-	1078	1075
Mov Cap-2 Maneuver	-	-	-	-	1078	-
Stage 1	-	-	-	-	1154	-
Stage 2	-	-	-	-	1146	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.8	0	8.4			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1054	-	-	-	1076	
HCM Lane V/C Ratio	0.004	-	-	-	0.026	
HCM Control Delay (s)	8.4	0	-	-	8.4	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour

Existing Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	8	89	132	293	310	48
Future Volume (vph)	8	89	132	293	310	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			1%	-2%	
Storage Length (ft)	0	55	225		225	
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	33%	6%	22%	10%	5%	3%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour

















Existing Conditions

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↗	↗	↗
Traffic Vol, veh/h	8	89	132	293	310	48
Future Vol, veh/h	8	89	132	293	310	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	55	225	-	-	225
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	1	-2	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	33	6	22	10	5	3
Mvmt Flow	11	117	174	386	408	63
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1142	408	408	0	-	0
Stage 1	408	-	-	-	-	-
Stage 2	734	-	-	-	-	-
Critical Hdwy	6.73	6.26	4.5	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.3	3.2	3.2	-	-	-
Pot Cap-1 Maneuver	208	660	805	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	163	660	805	-	-	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13	3.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	805	-	163	660	-	-
HCM Lane V/C Ratio	0.216	-	0.065	0.177	-	-
HCM Control Delay (s)	10.7	-	28.6	11.6	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0.2	0.6	-	-

7: Springhouse Road & Winchester Road

Timing Plan: AM Peak Hour

Existing Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	55	18	77	25	11	11	135	122	13	305	6
Future Volume (vph)	13	55	18	77	25	11	11	135	122	13	305	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	16	16	12	12	12	12	12	12
Grade (%)		-1%			-1%			2%			-1%	
Link Speed (mph)		25			35			30			30	
Link Distance (ft)		451			575			1861			726	
Travel Time (s)		12.3			11.2			42.3			16.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	0%	14%	8%	0%	33%	0%	7%	6%	0%	4%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

7: Springhouse Road & Winchester Road

Timing Plan: AM Peak Hour

Existing Conditions

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	55	18	77	25	11	11	135	122	13	305	6
Future Vol, veh/h	13	55	18	77	25	11	11	135	122	13	305	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	10	0	14	8	0	33	0	7	6	0	4	0
Mvmt Flow	14	61	20	86	28	12	12	150	136	14	339	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10	10.5	11	12.8
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	15%	68%	4%
Vol Thru, %	50%	64%	22%	94%
Vol Right, %	46%	21%	10%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	268	86	113	324
LT Vol	11	13	77	13
Through Vol	135	55	25	305
RT Vol	122	18	11	6
Lane Flow Rate	298	96	126	360
Geometry Grp	1	1	1	1
Degree of Util (X)	0.398	0.155	0.206	0.498
Departure Headway (Hd)	4.815	5.843	5.915	4.979
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	750	613	606	727
Service Time	2.826	3.887	3.956	2.989
HCM Lane V/C Ratio	0.397	0.157	0.208	0.495
HCM Control Delay	11	10	10.5	12.8
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.9	0.5	0.8	2.8

1: S.R. 309 & Ridgeview Drive

Timing Plan: PM Peak Hour

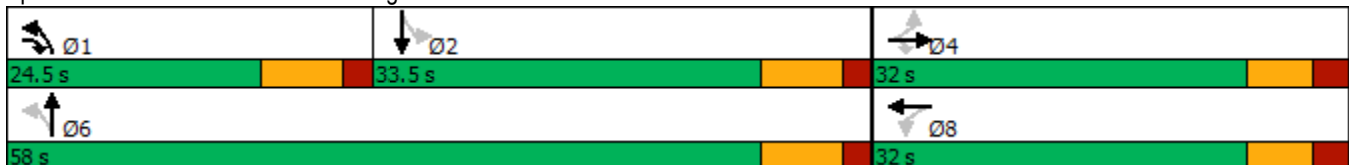
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	60	189	232	23	10	305	693	635	16	702	7
Future Volume (vph)	11	60	189	232	23	10	305	693	635	16	702	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	12	12	12	12	11	11	12	11	11
Grade (%)		1%			-1%			4%			-4%	
Storage Length (ft)	50		60	210		0	225		0	225		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		276			148			1327			900	
Travel Time (s)		5.4			2.9			16.5			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	5%	4%	10%	3%	6%	3%	0%	4%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		15.0	15.0	
Minimum Split (s)	25.0	25.0	12.5	25.0	25.0		12.5	25.5		22.5	22.5	
Total Split (s)	32.0	32.0	24.5	32.0	32.0		24.5	58.0		33.5	33.5	
Total Split (%)	35.6%	35.6%	27.2%	35.6%	35.6%		27.2%	64.4%		37.2%	37.2%	
Yellow Time (s)	4.5	4.5	5.5	4.5	4.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.5	2.5	2.0	2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0	6.5	6.0	6.0		6.5	6.5		6.5	6.5	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Recall Mode	None	None	None	None	None		None	Max		Max	Max	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 86.2
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord

Splits and Phases: 1: S.R. 309 & Ridgeview Drive



1: S.R. 309 & Ridgeview Drive

Timing Plan: PM Peak Hour

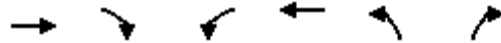
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	60	189	232	23	10	305	693	635	16	702	7
Future Volume (veh/h)	11	60	189	232	23	10	305	693	635	16	702	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1852	1766	1780	1695	1669	1626	1669	1949	1892	1949
Adj Flow Rate, veh/h	12	65	157	252	25	7	332	753	631	17	763	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	5	4	10	3	6	3	0	4	0
Cap, veh/h	457	498	696	371	372	104	455	939	767	167	1246	13
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.27	0.17	0.58	0.57	0.34	0.34	0.33
Sat Flow, veh/h	1395	1794	1569	1155	1338	375	1589	1615	1319	430	3645	38
Grp Volume(v), veh/h	12	65	157	252	0	32	332	720	664	17	376	395
Grp Sat Flow(s),veh/h/ln	1395	1794	1569	1155	0	1713	1589	1545	1389	430	1798	1885
Q Serve(g_s), s	0.6	2.4	5.5	18.5	0.0	1.2	10.9	32.3	34.3	2.9	15.4	15.4
Cycle Q Clear(g_c), s	1.3	2.4	5.5	20.9	0.0	1.2	10.9	32.3	34.3	15.5	15.4	15.4
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.95	1.00		0.02
Lane Grp Cap(c), veh/h	457	498	696	371	0	476	455	898	807	167	615	645
V/C Ratio(X)	0.03	0.13	0.23	0.68	0.00	0.07	0.73	0.80	0.82	0.10	0.61	0.61
Avail Cap(c_a), veh/h	479	527	721	389	0	503	514	898	807	167	615	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	24.0	15.2	31.8	0.0	23.6	15.6	14.5	15.3	29.5	24.3	24.3
Incr Delay (d2), s/veh	0.0	0.1	0.2	4.5	0.0	0.1	4.6	7.5	9.3	1.2	4.5	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	1.8	3.4	9.2	0.0	0.9	6.6	15.6	15.7	0.6	10.8	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	24.1	15.4	36.3	0.0	23.7	20.2	22.0	24.6	30.7	28.8	28.6
LnGrp LOS	C	C	B	D	A	C	C	C	C	C	C	C
Approach Vol, veh/h		234			284			1716			788	
Approach Delay, s/veh		18.3			34.9			22.7			28.7	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	21.2	36.8		30.6		58.0		30.6				
Change Period (Y+Rc), s	7.5	7.5		7.0		7.5		7.0				
Max Green Setting (Gmax), s	17.0	26.0		25.0		50.5		25.0				
Max Q Clear Time (g_c+I1), s	13.4	18.0		8.0		36.3		23.4				
Green Ext Time (p_c), s	0.4	2.7		0.8		7.4		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				25.0								
HCM 6th LOS				C								

2: Bulldog Drive & Ridgeview Drive

Timing Plan: PM Peak Hour

Existing Conditions



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	640	71	5	197	68	6
Future Volume (vph)	640	71	5	197	68	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	10	13	10	10
Grade (%)	1%			-2%	1%	
Storage Length (ft)		0	120		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	148			414	1819	
Travel Time (s)	2.9			8.1	35.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	9%	0%	3%	14%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2: Bulldog Drive & Ridgeview Drive

Timing Plan: PM Peak Hour

Existing Conditions

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	640	71	5	197	68	6
Future Vol, veh/h	640	71	5	197	68	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	120	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	-2	1	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	9	0	3	14	0
Mvmt Flow	703	78	5	216	75	7
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	781	0	860	742
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	118	-
Critical Hdwy	-	-	4.3	-	6.7	6.3
Critical Hdwy Stg 1	-	-	-	-	5.81	-
Critical Hdwy Stg 2	-	-	-	-	6.21	-
Follow-up Hdwy	-	-	3	-	3.1	3.1
Pot Cap-1 Maneuver	-	-	642	-	332	429
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	642	-	329	429
Mov Cap-2 Maneuver	-	-	-	-	329	-
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	987	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	19.2			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	335	-	-	642	-	
HCM Lane V/C Ratio	0.243	-	-	0.009	-	
HCM Control Delay (s)	19.2	-	-	10.7	0	
HCM Lane LOS	C	-	-	B	A	
HCM 95th %tile Q(veh)	0.9	-	-	0	-	

3: Ridgeview Drive & Walbert Avenue

Timing Plan: PM Peak Hour

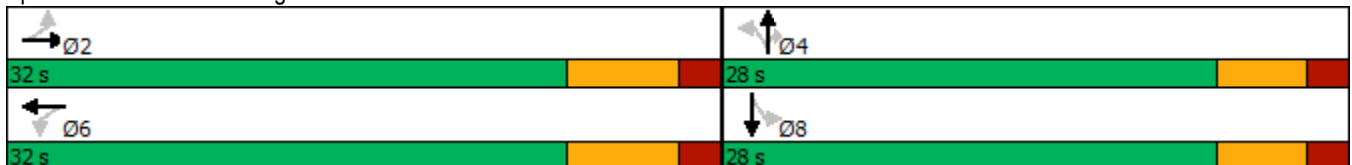
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	245	8	135	266	38	17	277	249	16	30	3
Future Volume (vph)	17	245	8	135	266	38	17	277	249	16	30	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	14	14	14	14
Grade (%)		-3%			2%			7%			-4%	
Storage Length (ft)	85		0	125		0	0		275	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		931			1894			1185			805	
Travel Time (s)		14.1			28.7			23.1			15.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	2%	16%	0%	0%	2%	19%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	24.0	24.0		17.0	17.0		10.0	10.0	10.0	10.0	10.0	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%	46.7%	46.7%	46.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	0.0			-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 41.2
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ridgeview Drive & Walbert Avenue



3: Ridgeview Drive & Walbert Avenue

Timing Plan: PM Peak Hour

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	245	8	135	266	38	17	277	249	16	30	3
Future Volume (veh/h)	17	245	8	135	266	38	17	277	249	16	30	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1912	1883	1912	1764	1750	1553	1527	1527	1558	1746	2027	2027
Adj Flow Rate, veh/h	18	258	6	142	280	34	18	292	199	17	32	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	1	2	16	0	0	2	19	0	0
Cap, veh/h	471	656	15	506	548	66	122	478	388	203	336	24
Arrive On Green	0.36	0.36	0.33	0.36	0.36	0.33	0.29	0.32	0.29	0.29	0.32	0.29
Sat Flow, veh/h	1150	1833	43	1110	1530	186	37	1480	1321	199	1040	76
Grp Volume(v), veh/h	18	0	264	142	0	314	310	0	199	52	0	0
Grp Sat Flow(s),veh/h/ln	1150	0	1876	1110	0	1716	1517	0	1321	1314	0	0
Q Serve(g_s), s	0.4	0.0	3.6	3.7	0.0	5.0	0.0	0.0	4.3	0.1	0.0	0.0
Cycle Q Clear(g_c), s	4.9	0.0	3.6	6.8	0.0	5.0	6.1	0.0	4.3	6.2	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.11	0.06		1.00	0.33		0.06
Lane Grp Cap(c), veh/h	471	0	671	506	0	614	556	0	388	525	0	0
V/C Ratio(X)	0.04	0.00	0.39	0.28	0.00	0.51	0.56	0.00	0.51	0.10	0.00	0.00
Avail Cap(c_a), veh/h	928	0	1416	946	0	1296	1074	0	844	1053	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.4	0.0	8.3	10.6	0.0	8.7	10.0	0.0	10.1	8.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	0.3	0.0	0.7	0.9	0.0	1.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	0.0	1.6	1.1	0.0	2.0	2.8	0.0	1.7	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.5	0.0	8.6	10.9	0.0	9.4	10.9	0.0	11.2	8.4	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	B	A	A	A
Approach Vol, veh/h		282			456			509			52	
Approach Delay, s/veh		8.8			9.9			11.0			8.4	
Approach LOS		A			A			B			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.3		16.1		18.3		16.1				
Change Period (Y+Rc), s		7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s		25.0		22.0		25.0		22.0				
Max Q Clear Time (g_c+I1), s		7.4		8.1		9.3		8.2				
Green Ext Time (p_c), s		1.3		2.1		2.0		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				10.0								
HCM 6th LOS				B								

4: Bulldog Drive & Crackersport Road

Timing Plan: PM Peak Hour

Existing Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	↖
Traffic Volume (vph)	48	13	4	42	22	4
Future Volume (vph)	48	13	4	42	22	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	14	11	15	13	13
Grade (%)	-3%			2%	3%	
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			35	25	
Link Distance (ft)	1819			992	325	
Travel Time (s)	49.6			19.3	8.9	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

4: Bulldog Drive & Crackersport Road

Timing Plan: PM Peak Hour

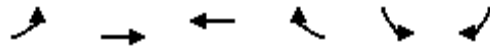
Existing Conditions

Intersection						
Int Delay, s/veh	2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	48	13	4	42	22	4
Future Vol, veh/h	48	13	4	42	22	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-3	-	-	2	3	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	63	17	5	55	29	5
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	80	0	137	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	4.3	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	1127	-	973	1052
Stage 1	-	-	-	-	1097	-
Stage 2	-	-	-	-	1106	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1127	-	969	1052
Mov Cap-2 Maneuver	-	-	-	-	969	-
Stage 1	-	-	-	-	1097	-
Stage 2	-	-	-	-	1102	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	8.8			
HCM LOS				A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	981	-	-	1127	-	
HCM Lane V/C Ratio	0.035	-	-	0.005	-	
HCM Control Delay (s)	8.8	-	-	8.2	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

5: Crackersport Road & Winchester Road

Timing Plan: PM Peak Hour

Existing Conditions



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (vph)	7	41	45	12	11	4
Future Volume (vph)	7	41	45	12	11	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	12	12
Grade (%)		0%	-1%		-2%	
Link Speed (mph)		35	35		25	
Link Distance (ft)		347	1175		531	
Travel Time (s)		6.8	22.9		14.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary
 Area Type: Other
 Control Type: Unsignalized

5: Crackersport Road & Winchester Road

Timing Plan: PM Peak Hour













Existing Conditions

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	41	45	12	11	4
Future Vol, veh/h	7	41	45	12	11	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	-1	-	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	3	0	0	0	0
Mvmt Flow	9	51	56	15	14	5
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	71	0	-	0	133	64
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	4.3	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	1135	-	-	-	1016	1073
Stage 1	-	-	-	-	1127	-
Stage 2	-	-	-	-	1122	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1135	-	-	-	1008	1073
Mov Cap-2 Maneuver	-	-	-	-	1008	-
Stage 1	-	-	-	-	1118	-
Stage 2	-	-	-	-	1122	-
Approach	EB	WB	SB			
HCM Control Delay, s	1.2	0	8.6			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1135	-	-	-	1025	
HCM Lane V/C Ratio	0.008	-	-	-	0.018	
HCM Control Delay (s)	8.2	0	-	-	8.6	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

Existing Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	53	46	478	454	23
Future Volume (vph)	12	53	46	478	454	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			-1%	-2%	
Storage Length (ft)	0	55	225			225
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	10%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

Existing Conditions

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	12	53	46	478	454	23
Future Vol, veh/h	12	53	46	478	454	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	55	225	-	-	225
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-1	-2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	10	0	0	1	1	0
Mvmt Flow	13	58	51	525	499	25

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1126	499	499	0	-	0
Stage 1	499	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Critical Hdwy	6.7	6.3	4.3	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.3	3.2	3	-	-	-
Pot Cap-1 Maneuver	215	582	808	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	582	808	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	550	-	-	-	-	-

















Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	808	-	201	582	-	-
HCM Lane V/C Ratio	0.063	-	0.066	0.1	-	-
HCM Control Delay (s)	9.8	-	24.2	11.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	0.3	-	-

7: Springhouse Road & Winchester Road

Timing Plan: PM Peak Hour

Existing Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	41	11	196	64	46	30	327	126	13	237	7
Future Volume (vph)	6	41	11	196	64	46	30	327	126	13	237	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	16	16	12	12	12	12	12	12
Grade (%)		-1%			-1%			2%			-1%	
Link Speed (mph)		25			35			30			30	
Link Distance (ft)		451			575			1861			726	
Travel Time (s)		12.3			11.2			42.3			16.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	2%	1%	0%	1%	17%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

7: Springhouse Road & Winchester Road

Timing Plan: PM Peak Hour

Existing Conditions

Intersection	
Intersection Delay, s/veh	20
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	41	11	196	64	46	30	327	126	13	237	7
Future Vol, veh/h	6	41	11	196	64	46	30	327	126	13	237	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	3	0	2	1	0	1	17
Mvmt Flow	6	43	12	206	67	48	32	344	133	14	249	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.9	17.2	26	14.2
HCM LOS	B	C	D	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	10%	64%	5%
Vol Thru, %	68%	71%	21%	92%
Vol Right, %	26%	19%	15%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	483	58	306	257
LT Vol	30	6	196	13
Through Vol	327	41	64	237
RT Vol	126	11	46	7
Lane Flow Rate	508	61	322	271
Geometry Grp	1	1	1	1
Degree of Util (X)	0.786	0.117	0.564	0.457
Departure Headway (Hd)	5.567	6.899	6.304	6.076
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	651	518	573	592
Service Time	3.588	4.962	4.328	4.121
HCM Lane V/C Ratio	0.78	0.118	0.562	0.458
HCM Control Delay	26	10.9	17.2	14.2
HCM Lane LOS	D	B	C	B
HCM 95th-tile Q	7.6	0.4	3.5	2.4

2025 Base (No-Build) Conditions

1: S.R. 309 & Ridgeview Drive

Timing Plan: AM Peak Hour

Base 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	7	68	433	44	15	313	678	607	11	912	36
Future Volume (vph)	9	7	68	433	44	15	313	678	607	11	912	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	12	12	12	12	11	11	12	11	11
Grade (%)		1%			-1%			4%			-4%	
Storage Length (ft)	50		60	530		0	225		0	225		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		276			148			1327			900	
Travel Time (s)		5.4			2.9			16.5			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	67%	0%	12%	8%	3%	13%	5%	14%	4%	0%	10%	17%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		15.0	15.0	
Minimum Split (s)	25.0	25.0	14.0	25.0	25.0		14.0	25.5		24.0	24.0	
Total Split (s)	30.0	30.0	21.0	30.0	30.0		21.0	60.0		39.0	39.0	
Total Split (%)	33.3%	33.3%	23.3%	33.3%	33.3%		23.3%	66.7%		43.3%	43.3%	
Yellow Time (s)	4.0	4.0	5.0	4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	8.0	7.0	7.0		8.0	8.0		8.0	8.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Max		Max	Max	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Natural Cycle: 140
 Control Type: Semi Act-Uncoord

Splits and Phases: 1: S.R. 309 & Ridgeview Drive



1: S.R. 309 & Ridgeview Drive

Timing Plan: AM Peak Hour

Base 2025 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	7	68	433	44	15	313	678	607	11	912	36
Future Volume (veh/h)	9	7	68	433	44	15	313	678	607	11	912	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	854	1794	1691	1724	1795	1652	1641	1514	1655	1949	1807	1707
Adj Flow Rate, veh/h	10	8	67	471	48	12	340	737	619	12	991	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	67	0	12	8	3	13	5	14	4	0	10	17
Cap, veh/h	232	459	573	405	354	89	342	866	712	148	1161	45
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.24	0.14	0.58	0.57	0.34	0.34	0.33
Sat Flow, veh/h	647	1794	1433	1288	1386	346	1562	1499	1232	442	3371	129
Grp Volume(v), veh/h	10	8	67	471	0	60	340	706	650	12	505	524
Grp Sat Flow(s),veh/h/ln	647	1794	1433	1288	0	1732	1562	1438	1292	442	1716	1784
Q Serve(g_s), s	1.1	0.3	2.6	22.7	0.0	2.4	12.9	36.7	38.6	2.1	24.6	24.6
Cycle Q Clear(g_c), s	3.0	0.3	2.6	23.0	0.0	2.4	12.9	36.7	38.6	19.3	24.6	24.6
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.95	1.00		0.07
Lane Grp Cap(c), veh/h	232	459	573	405	0	443	342	831	747	148	591	614
V/C Ratio(X)	0.04	0.02	0.12	1.16	0.00	0.14	0.99	0.85	0.87	0.08	0.85	0.85
Avail Cap(c_a), veh/h	232	459	573	405	0	443	342	831	747	148	591	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	25.1	17.0	35.9	0.0	25.9	21.0	15.8	16.6	33.1	27.4	27.4
Incr Delay (d2), s/veh	0.1	0.0	0.1	97.3	0.0	0.1	47.0	10.6	13.2	1.1	14.5	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.2	1.5	29.5	0.0	1.8	12.6	17.1	17.1	0.5	16.7	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	25.1	17.1	133.2	0.0	26.1	68.1	26.4	29.7	34.2	41.9	41.5
LnGrp LOS	C	C	B	F	A	C	E	C	C	C	D	D
Approach Vol, veh/h		85			531			1696			1041	
Approach Delay, s/veh		19.0			121.1			36.0			41.6	
Approach LOS		B			F			D			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	21.0	39.0		30.0		60.0		30.0				
Change Period (Y+Rc), s	9.0	9.0		8.0		9.0		8.0				
Max Green Setting (Gmax), s	12.0	30.0		22.0		51.0		22.0				
Max Q Clear Time (g_c+I1), s	15.4	27.1		5.5		40.6		25.5				
Green Ext Time (p_c), s	0.0	1.6		0.2		5.9		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				50.8								
HCM 6th LOS				D								

2: Bulldog Drive & Ridgeview Drive

Timing Plan: AM Peak Hour

Base 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖↗	↖↗	
Traffic Volume (vph)	366	259	8	399	93	1
Future Volume (vph)	366	259	8	399	93	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	10	13	10	10
Grade (%)	1%			-2%	1%	
Storage Length (ft)		0	450		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	148			414	1819	
Travel Time (s)	2.9			8.1	35.4	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	7%	12%	0%	5%	25%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

2: Bulldog Drive & Ridgeview Drive

Timing Plan: AM Peak Hour

Base 2025 Conditions

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕↕	↕↕	
Traffic Vol, veh/h	366	259	8	399	93	1
Future Vol, veh/h	366	259	8	399	93	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	450	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	-2	1	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	7	12	0	5	25	0
Mvmt Flow	416	294	9	453	106	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	710	0	808	563
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.3	-	6.9	6.3
Critical Hdwy Stg 1	-	-	-	-	5.975	-
Critical Hdwy Stg 2	-	-	-	-	6.375	-
Follow-up Hdwy	-	-	3	-	3.2	3.1
Pot Cap-1 Maneuver	-	-	681	-	335	547
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	811	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	681	-	329	547
Mov Cap-2 Maneuver	-	-	-	-	329	-
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	796	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	21			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	330	-	-	681	-	
HCM Lane V/C Ratio	0.324	-	-	0.013	-	
HCM Control Delay (s)	21	-	-	10.4	0.1	
HCM Lane LOS	C	-	-	B	A	
HCM 95th %tile Q(veh)	1.4	-	-	0	-	

3: Ridgeview Drive & Walbert Avenue

Timing Plan: AM Peak Hour

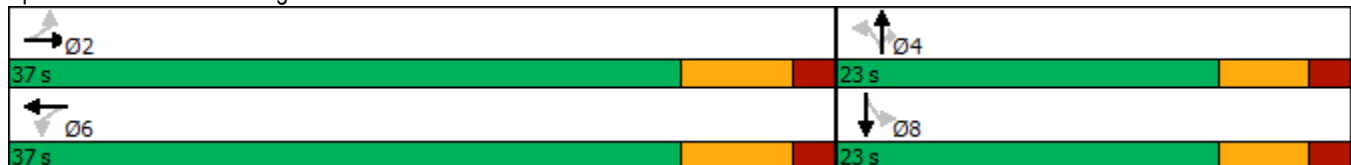
Base 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	256	6	237	216	10	17	54	223	10	128	12
Future Volume (vph)	10	256	6	237	216	10	17	54	223	10	128	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	14	14	14	14
Grade (%)		-3%			2%			7%			-4%	
Storage Length (ft)	85		0	125		0	0		275	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		931			1894			1185			805	
Travel Time (s)		14.1			28.7			23.1			15.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	10%	8%	0%	7%	10%	10%	6%	6%	3%	20%	0%	8%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	24.0	24.0		17.0	17.0		10.0	10.0	10.0	10.0	10.0	
Total Split (s)	37.0	37.0		37.0	37.0		23.0	23.0	23.0	23.0	23.0	
Total Split (%)	61.7%	61.7%		61.7%	61.7%		38.3%	38.3%	38.3%	38.3%	38.3%	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	0.0			-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 39.3
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ridgeview Drive & Walbert Avenue



3: Ridgeview Drive & Walbert Avenue

Timing Plan: AM Peak Hour

Base 2025 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	256	6	237	216	10	17	54	223	10	128	12
Future Volume (veh/h)	10	256	6	237	216	10	17	54	223	10	128	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1770	1798	1912	1679	1637	1637	1442	1442	1544	1731	2027	1909
Adj Flow Rate, veh/h	11	294	5	272	248	9	20	62	186	11	147	11
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	10	8	0	7	10	10	6	6	3	20	0	8
Cap, veh/h	636	839	14	591	747	27	160	267	255	119	396	28
Arrive On Green	0.48	0.48	0.45	0.48	0.48	0.45	0.19	0.22	0.19	0.19	0.22	0.19
Sat Flow, veh/h	1121	1763	30	1024	1570	57	167	1201	1308	60	1782	128
Grp Volume(v), veh/h	11	0	299	272	0	257	82	0	186	169	0	0
Grp Sat Flow(s),veh/h/ln	1121	0	1793	1024	0	1627	1368	0	1308	1970	0	0
Q Serve(g_s), s	0.2	0.0	3.8	8.1	0.0	3.6	0.0	0.0	4.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.3	0.0	3.8	11.4	0.0	3.6	1.7	0.0	4.9	2.7	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.04	0.24		1.00	0.07		0.07
Lane Grp Cap(c), veh/h	636	0	853	591	0	774	389	0	255	489	0	0
V/C Ratio(X)	0.02	0.00	0.35	0.46	0.00	0.33	0.21	0.00	0.73	0.35	0.00	0.00
Avail Cap(c_a), veh/h	1057	0	1526	976	0	1385	744	0	611	1015	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.8	0.0	6.0	9.4	0.0	6.0	11.8	0.0	13.8	12.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.6	0.0	0.2	0.3	0.0	4.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	0.0	1.2	1.9	0.0	1.0	0.8	0.0	2.5	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.8	0.0	6.3	9.9	0.0	6.2	12.1	0.0	17.8	12.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		310			529			268			169	
Approach Delay, s/veh		6.3			8.1			16.0			12.5	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.3		13.1		23.3		13.1				
Change Period (Y+Rc), s		7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s		30.0		17.0		30.0		17.0				
Max Q Clear Time (g_c+I1), s		5.8		6.9		13.9		4.7				
Green Ext Time (p_c), s		1.6		0.7		2.4		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				9.9								
HCM 6th LOS				A								

4: Bulldog Drive & Crackersport Road

Timing Plan: AM Peak Hour

Base 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↘	↘
Traffic Volume (vph)	101	6	3	51	13	1
Future Volume (vph)	101	6	3	51	13	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	14	11	15	13	13
Grade (%)	-3%			2%	3%	
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			35	25	
Link Distance (ft)	1819			992	325	
Travel Time (s)	49.6			19.3	8.9	
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Heavy Vehicles (%)	9%	0%	0%	15%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

4: Bulldog Drive & Crackersport Road

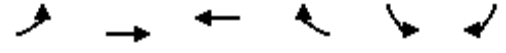
Timing Plan: AM Peak Hour

Base 2025 Conditions

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	6	3	51	13	1
Future Vol, veh/h	101	6	3	51	13	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-3	-	-	2	3	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	9	0	0	15	0	0
Mvmt Flow	158	9	5	80	20	2
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	167	0	253	163
Stage 1	-	-	-	-	163	-
Stage 2	-	-	-	-	90	-
Critical Hdwy	-	-	4.3	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	1053	-	814	927
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	1072	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1053	-	810	927
Mov Cap-2 Maneuver	-	-	-	-	810	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	1067	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.5	9.5			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	817	-	-	1053	-	
HCM Lane V/C Ratio	0.027	-	-	0.004	-	
HCM Control Delay (s)	9.5	-	-	8.4	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

5: Crackersport Road & Winchester Road

Timing Plan: AM Peak Hour
Base 2025 Conditions



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (vph)	4	37	29	11	13	13
Future Volume (vph)	4	37	29	11	13	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	12	12
Grade (%)		0%	-1%		-2%	
Link Speed (mph)		35	35		25	
Link Distance (ft)		347	1175		531	
Travel Time (s)		6.8	22.9		14.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	33%	14%	27%	22%	0%	10%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

5: Crackersport Road & Winchester Road

Timing Plan: AM Peak Hour

Base 2025 Conditions

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	4	37	29	11	13	13
Future Vol, veh/h	4	37	29	11	13	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	-1	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	33	14	27	22	0	10
Mvmt Flow	4	40	31	12	14	14

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	43	0	-	0	85 37
Stage 1	-	-	-	-	37 -
Stage 2	-	-	-	-	48 -
Critical Hdwy	4.6	-	-	-	6 6.1
Critical Hdwy Stg 1	-	-	-	-	5 -
Critical Hdwy Stg 2	-	-	-	-	5 -
Follow-up Hdwy	3.3	-	-	-	3 3.2
Pot Cap-1 Maneuver	1053	-	-	-	1079 1074
Stage 1	-	-	-	-	1158 -
Stage 2	-	-	-	-	1145 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1053	-	-	-	1075 1074
Mov Cap-2 Maneuver	-	-	-	-	1075 -
Stage 1	-	-	-	-	1153 -
Stage 2	-	-	-	-	1145 -













Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1053	-	-	-	1074
HCM Lane V/C Ratio	0.004	-	-	-	0.026
HCM Control Delay (s)	8.4	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour

Base 2025 Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	8	91	135	317	344	49
Future Volume (vph)	8	91	135	317	344	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			1%	-2%	
Storage Length (ft)	0	55	225			225
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	33%	6%	22%	10%	5%	3%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour

















Base 2025 Conditions

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	91	135	317	344	49
Future Vol, veh/h	8	91	135	317	344	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	55	225	-	-	225
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	1	-2	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	33	6	22	10	5	3
Mvmt Flow	11	120	178	417	453	64
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1226	453	453	0	0	
Stage 1	453	-	-	-	-	
Stage 2	773	-	-	-	-	
Critical Hdwy	6.73	6.26	4.5	-	-	
Critical Hdwy Stg 1	5.73	-	-	-	-	
Critical Hdwy Stg 2	5.73	-	-	-	-	
Follow-up Hdwy	3.3	3.2	3.2	-	-	
Pot Cap-1 Maneuver	184	622	776	-	-	
Stage 1	648	-	-	-	-	
Stage 2	445	-	-	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	142	622	776	-	-	
Mov Cap-2 Maneuver	142	-	-	-	-	
Stage 1	500	-	-	-	-	
Stage 2	445	-	-	-	-	
Approach	EB	NB	SB			
HCM Control Delay, s	13.8	3.3	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	776	-	142	622	-	-
HCM Lane V/C Ratio	0.229	-	0.074	0.193	-	-
HCM Control Delay (s)	11	-	32.4	12.2	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.9	-	0.2	0.7	-	-

7: Springhouse Road & Winchester Road

Timing Plan: AM Peak Hour

Base 2025 Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	56	18	78	25	11	11	156	124	13	339	6
Future Volume (vph)	13	56	18	78	25	11	11	156	124	13	339	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	16	16	12	12	12	12	12	12
Grade (%)		-1%			-1%			2%			-1%	
Link Speed (mph)		25			35			30			30	
Link Distance (ft)		451			575			1861			726	
Travel Time (s)		12.3			11.2			42.3			16.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	0%	14%	8%	0%	33%	0%	7%	6%	0%	4%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

7: Springhouse Road & Winchester Road

Timing Plan: AM Peak Hour

Base 2025 Conditions

Intersection												
Intersection Delay, s/veh	12.5											
Intersection LOS	B											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	56	18	78	25	11	11	156	124	13	339	6
Future Vol, veh/h	13	56	18	78	25	11	11	156	124	13	339	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	10	0	14	8	0	33	0	7	6	0	4	0
Mvmt Flow	14	62	20	87	28	12	12	173	138	14	377	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	10.3			10.8			11.8			14.2		
HCM LOS	B			B			B			B		
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	4%	15%	68%	4%								
Vol Thru, %	54%	64%	22%	95%								
Vol Right, %	43%	21%	10%	2%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	291	87	114	358								
LT Vol	11	13	78	13								
Through Vol	156	56	25	339								
RT Vol	124	18	11	6								
Lane Flow Rate	323	97	127	398								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.44	0.162	0.215	0.556								
Departure Headway (Hd)	4.901	6.034	6.099	5.032								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	734	594	588	716								
Service Time	2.937	4.083	4.146	3.065								
HCM Lane V/C Ratio	0.44	0.163	0.216	0.556								
HCM Control Delay	11.8	10.3	10.8	14.2								
HCM Lane LOS	B	B	B	B								
HCM 95th-tile Q	2.3	0.6	0.8	3.5								

1: S.R. 309 & Ridgeview Drive

Timing Plan: PM Peak Hour

Base 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	81	273	279	43	10	358	723	711	16	748	9
Future Volume (vph)	21	81	273	279	43	10	358	723	711	16	748	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	12	12	12	12	11	11	12	11	11
Grade (%)		1%			-1%			4%			-4%	
Storage Length (ft)	50		60	530		0	225		0	225		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		276			148			1327			900	
Travel Time (s)		5.4			2.9			16.5			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	5%	4%	10%	3%	6%	3%	0%	4%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		15.0	15.0	
Minimum Split (s)	25.0	25.0	14.0	25.0	25.0		14.0	25.5		24.0	24.0	
Total Split (s)	33.0	33.0	24.0	33.0	33.0		24.0	57.0		33.0	33.0	
Total Split (%)	36.7%	36.7%	26.7%	36.7%	36.7%		26.7%	63.3%		36.7%	36.7%	
Yellow Time (s)	4.0	4.0	5.0	4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	8.0	7.0	7.0		8.0	8.0		8.0	8.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Max		Max	Max	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 88.8
 Natural Cycle: 90
 Control Type: Semi Act-Uncoord

Splits and Phases: 1: S.R. 309 & Ridgeview Drive



1: S.R. 309 & Ridgeview Drive

Timing Plan: PM Peak Hour

Base 2025 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	81	273	279	43	10	358	723	711	16	748	9
Future Volume (veh/h)	21	81	273	279	43	10	358	723	711	16	748	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1852	1766	1780	1695	1669	1626	1669	1949	1892	1949
Adj Flow Rate, veh/h	23	88	249	303	47	7	389	786	714	17	813	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	5	4	10	3	6	3	0	4	0
Cap, veh/h	451	518	732	342	437	65	406	853	741	98	1010	12
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.28	0.18	0.54	0.53	0.28	0.28	0.27
Sat Flow, veh/h	1367	1794	1569	1040	1514	226	1589	1566	1361	385	3637	45
Grp Volume(v), veh/h	23	88	249	303	0	54	389	775	725	17	402	421
Grp Sat Flow(s),veh/h/ln	1367	1794	1569	1040	0	1740	1589	1545	1382	385	1798	1884
Q Serve(g_s), s	1.1	3.3	9.1	22.7	0.0	2.1	15.1	41.3	45.4	4.0	18.7	18.7
Cycle Q Clear(g_c), s	2.7	3.3	9.1	26.0	0.0	2.1	15.1	41.3	45.4	24.8	18.7	18.7
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.98	1.00		0.02
Lane Grp Cap(c), veh/h	451	518	732	342	0	503	406	841	752	98	499	523
V/C Ratio(X)	0.05	0.17	0.34	0.89	0.00	0.11	0.96	0.92	0.96	0.17	0.80	0.80
Avail Cap(c_a), veh/h	451	518	732	342	0	503	406	841	752	98	499	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	23.9	15.2	35.2	0.0	23.5	19.8	18.7	20.1	42.8	30.2	30.2
Incr Delay (d2), s/veh	0.0	0.2	0.3	23.0	0.0	0.1	33.7	16.9	25.1	3.8	12.9	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	2.5	5.5	13.7	0.0	1.5	13.1	21.9	23.5	0.8	14.0	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	24.1	15.5	58.2	0.0	23.6	53.5	35.7	45.2	46.7	43.2	42.7
LnGrp LOS	C	C	B	E	A	C	D	D	D	D	D	D
Approach Vol, veh/h		360			357			1889			840	
Approach Delay, s/veh		18.2			53.0			43.0			43.0	
Approach LOS		B			D			D			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	24.0	33.0		33.0		57.0		33.0				
Change Period (Y+Rc), s	9.0	9.0		8.0		9.0		8.0				
Max Green Setting (Gmax), s	15.0	24.0		25.0		48.0		25.0				
Max Q Clear Time (g_c+I1), s	17.6	27.3		11.6		47.4		28.5				
Green Ext Time (p_c), s	0.0	0.0		1.1		0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			41.4									
HCM 6th LOS			D									

2: Bulldog Drive & Ridgeview Drive

Timing Plan: PM Peak Hour

Base 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖↗	↖↗	
Traffic Volume (vph)	736	72	5	264	69	6
Future Volume (vph)	736	72	5	264	69	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	10	13	10	10
Grade (%)	1%			-2%	1%	
Storage Length (ft)		0	450		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	148			414	1819	
Travel Time (s)	2.9			8.1	35.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	9%	0%	3%	14%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

2: Bulldog Drive & Ridgeview Drive

Timing Plan: PM Peak Hour

Base 2025 Conditions

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	736	72	5	264	69	6
Future Vol, veh/h	736	72	5	264	69	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	450	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	-2	1	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	9	0	3	14	0
Mvmt Flow	809	79	5	290	76	7
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	888	0	1004	849
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	155	-
Critical Hdwy	-	-	4.3	-	6.7	6.3
Critical Hdwy Stg 1	-	-	-	-	5.81	-
Critical Hdwy Stg 2	-	-	-	-	6.21	-
Follow-up Hdwy	-	-	3	-	3.1	3.1
Pot Cap-1 Maneuver	-	-	588	-	268	371
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	949	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	588	-	265	371
Mov Cap-2 Maneuver	-	-	-	-	265	-
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	940	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	24			
HCM LOS				C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	271	-	-	588	-	
HCM Lane V/C Ratio	0.304	-	-	0.009	-	
HCM Control Delay (s)	24	-	-	11.2	0.1	
HCM Lane LOS	C	-	-	B	A	
HCM 95th %tile Q(veh)	1.2	-	-	0	-	

3: Ridgeview Drive & Walbert Avenue

Timing Plan: PM Peak Hour

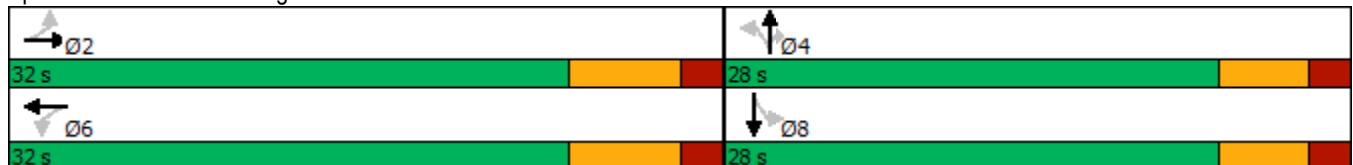
Base 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	297	8	201	308	39	17	282	338	16	31	3
Future Volume (vph)	17	297	8	201	308	39	17	282	338	16	31	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	14	14	14	14
Grade (%)		-3%			2%			7%			-4%	
Storage Length (ft)	85		0	125		0	0		275	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		931			1894			1185			805	
Travel Time (s)		14.1			28.7			23.1			15.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	2%	16%	0%	0%	2%	19%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	24.0	24.0		17.0	17.0		10.0	10.0	10.0	10.0	10.0	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%	46.7%	46.7%	46.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	0.0			-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 44
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ridgeview Drive & Walbert Avenue



3: Ridgeview Drive & Walbert Avenue

Timing Plan: PM Peak Hour

Base 2025 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	297	8	201	308	39	17	282	338	16	31	3
Future Volume (veh/h)	17	297	8	201	308	39	17	282	338	16	31	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1912	1883	1912	1764	1750	1553	1527	1527	1558	1746	2027	2027
Adj Flow Rate, veh/h	18	313	6	212	324	35	18	297	293	17	33	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	1	2	16	0	0	2	19	0	0
Cap, veh/h	472	766	15	496	646	70	101	480	396	174	306	22
Arrive On Green	0.42	0.42	0.39	0.42	0.42	0.39	0.30	0.32	0.30	0.30	0.32	0.30
Sat Flow, veh/h	1103	1842	35	1056	1552	168	35	1482	1321	190	945	68
Grp Volume(v), veh/h	18	0	319	212	0	359	315	0	293	53	0	0
Grp Sat Flow(s),veh/h/ln	1103	0	1877	1056	0	1719	1517	0	1321	1203	0	0
Q Serve(g_s), s	0.5	0.0	5.1	7.3	0.0	6.5	0.0	0.0	8.4	0.1	0.0	0.0
Cycle Q Clear(g_c), s	6.5	0.0	5.1	11.9	0.0	6.5	7.6	0.0	8.4	7.7	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.10	0.06		1.00	0.32		0.06
Lane Grp Cap(c), veh/h	472	0	781	496	0	715	545	0	396	474	0	0
V/C Ratio(X)	0.04	0.00	0.41	0.43	0.00	0.50	0.58	0.00	0.74	0.11	0.00	0.00
Avail Cap(c_a), veh/h	691	0	1154	706	0	1057	876	0	687	798	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	0.0	8.7	12.7	0.0	9.2	12.3	0.0	13.3	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.6	0.0	0.5	1.0	0.0	2.7	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.0	2.4	2.3	0.0	2.9	3.9	0.0	4.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.4	0.0	9.0	13.2	0.0	9.7	13.2	0.0	16.0	10.3	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h		337			571			608				53
Approach Delay, s/veh		9.2			11.0			14.6				10.3
Approach LOS		A			B			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.6		18.7		23.6		18.7				
Change Period (Y+Rc), s		7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s		25.0		22.0		25.0		22.0				
Max Q Clear Time (g_c+I1), s		9.0		10.4		14.4		9.7				
Green Ext Time (p_c), s		1.5		2.3		2.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				12.0								
HCM 6th LOS				B								

4: Bulldog Drive & Crackersport Road

Timing Plan: PM Peak Hour

Base 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	↖
Traffic Volume (vph)	49	13	4	43	22	4
Future Volume (vph)	49	13	4	43	22	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	14	11	15	13	13
Grade (%)	-3%			2%	3%	
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			35	25	
Link Distance (ft)	1819			992	325	
Travel Time (s)	49.6			19.3	8.9	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

4: Bulldog Drive & Crackersport Road

Timing Plan: PM Peak Hour

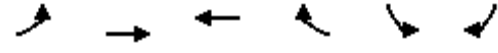
Base 2025 Conditions

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	49	13	4	43	22	4
Future Vol, veh/h	49	13	4	43	22	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-3	-	-	2	3	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	64	17	5	57	29	5
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	81	0	140	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	67	-
Critical Hdwy	-	-	4.3	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	1127	-	968	1050
Stage 1	-	-	-	-	1095	-
Stage 2	-	-	-	-	1103	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1127	-	964	1050
Mov Cap-2 Maneuver	-	-	-	-	964	-
Stage 1	-	-	-	-	1095	-
Stage 2	-	-	-	-	1099	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	8.8			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	976	-	-	1127	-	
HCM Lane V/C Ratio	0.035	-	-	0.005	-	
HCM Control Delay (s)	8.8	-	-	8.2	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

5: Crackersport Road & Winchester Road

Timing Plan: PM Peak Hour

Base 2025 Conditions



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	7	42	46	12	11	4
Future Volume (vph)	7	42	46	12	11	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	12	12
Grade (%)		0%	-1%		-2%	
Link Speed (mph)		35	35		25	
Link Distance (ft)		347	1175		531	
Travel Time (s)		6.8	22.9		14.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized

5: Crackersport Road & Winchester Road

Timing Plan: PM Peak Hour

Base 2025 Conditions

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	42	46	12	11	4
Future Vol, veh/h	7	42	46	12	11	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	-1	-	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	3	0	0	0	0
Mvmt Flow	9	53	58	15	14	5

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	73	0	-	0	137
Stage 1	-	-	-	-	66
Stage 2	-	-	-	-	71
Critical Hdwy	4.3	-	-	-	6
Critical Hdwy Stg 1	-	-	-	-	5
Critical Hdwy Stg 2	-	-	-	-	5
Follow-up Hdwy	3	-	-	-	3
Pot Cap-1 Maneuver	1134	-	-	-	1011
Stage 1	-	-	-	-	1125
Stage 2	-	-	-	-	1120
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1134	-	-	-	1003
Mov Cap-2 Maneuver	-	-	-	-	1003
Stage 1	-	-	-	-	1116
Stage 2	-	-	-	-	1120













Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1134	-	-	-	1020
HCM Lane V/C Ratio	0.008	-	-	-	0.018
HCM Control Delay (s)	8.2	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

Base 2025 Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	54	47	517	486	23
Future Volume (vph)	12	54	47	517	486	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			-1%	-2%	
Storage Length (ft)	0	55	225			225
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	10%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

















Base 2025 Conditions

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	54	47	517	486	23
Future Vol, veh/h	12	54	47	517	486	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	55	225	-	-	225
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-1	-2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	10	0	0	1	1	0
Mvmt Flow	13	59	52	568	534	25
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1206	534	534	0	-	0
Stage 1	534	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Critical Hdwy	6.7	6.3	4.3	-	-	-
Critical Hdwy Stg 1	5.5	-	-	-	-	-
Critical Hdwy Stg 2	5.5	-	-	-	-	-
Follow-up Hdwy	3.3	3.2	3	-	-	-
Pot Cap-1 Maneuver	191	555	786	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	178	555	786	-	-	-
Mov Cap-2 Maneuver	178	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.9	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	786	-	178	555	-	-
HCM Lane V/C Ratio	0.066	-	0.074	0.107	-	-
HCM Control Delay (s)	9.9	-	26.8	12.3	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	0.4	-	-

7: Springhouse Road & Winchester Road

Timing Plan: PM Peak Hour

Base 2025 Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	42	11	200	65	47	31	363	128	13	265	7
Future Volume (vph)	6	42	11	200	65	47	31	363	128	13	265	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	16	16	12	12	12	12	12	12
Grade (%)		-1%				-1%			2%			-1%
Link Speed (mph)		25				35			30			30
Link Distance (ft)		451				575			1861			726
Travel Time (s)		12.3				11.2			42.3			16.5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	2%	1%	0%	1%	17%
Shared Lane Traffic (%)												
Sign Control		Stop				Stop			Stop			Stop
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

7: Springhouse Road & Winchester Road

Timing Plan: PM Peak Hour

Base 2025 Conditions

Intersection	
Intersection Delay, s/veh	25.3
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	42	11	200	65	47	31	363	128	13	265	7
Future Vol, veh/h	6	42	11	200	65	47	31	363	128	13	265	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	3	0	2	1	0	1	17
Mvmt Flow	6	44	12	211	68	49	33	382	135	14	279	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.4	18.9	35.7	16
HCM LOS	B	C	E	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	10%	64%	5%
Vol Thru, %	70%	71%	21%	93%
Vol Right, %	25%	19%	15%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	522	59	312	285
LT Vol	31	6	200	13
Through Vol	363	42	65	265
RT Vol	128	11	47	7
Lane Flow Rate	549	62	328	300
Geometry Grp	1	1	1	1
Degree of Util (X)	0.873	0.125	0.597	0.523
Departure Headway (Hd)	5.72	7.27	6.545	6.27
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	632	491	552	573
Service Time	3.764	5.348	4.595	4.323
HCM Lane V/C Ratio	0.869	0.126	0.594	0.524
HCM Control Delay	35.7	11.4	18.9	16
HCM Lane LOS	E	B	C	C
HCM 95th-tile Q	10.2	0.4	3.9	3

2025 Projected (Build) Conditions

1: S.R. 309 & Ridgeview Drive

Timing Plan: AM Peak Hour

Projected 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	15	68	495	53	24	313	678	645	19	912	36
Future Volume (vph)	9	15	68	495	53	24	313	678	645	19	912	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	12	12	12	12	11	11	12	11	11
Grade (%)		1%			-1%			4%			-4%	
Storage Length (ft)	50		60	530		0	225		0	225		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		276			148			1327			900	
Travel Time (s)		5.4			2.9			16.5			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	67%	0%	12%	8%	3%	13%	5%	14%	4%	0%	10%	17%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		15.0	15.0	
Minimum Split (s)	25.0	25.0	14.0	25.0	25.0		14.0	25.5		24.0	24.0	
Total Split (s)	30.0	30.0	21.0	30.0	30.0		21.0	60.0		39.0	39.0	
Total Split (%)	33.3%	33.3%	23.3%	33.3%	33.3%		23.3%	66.7%		43.3%	43.3%	
Yellow Time (s)	4.0	4.0	5.0	4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	8.0	7.0	7.0		8.0	8.0		8.0	8.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Max		Max	Max	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Natural Cycle: 140
 Control Type: Semi Act-Uncoord

Splits and Phases: 1: S.R. 309 & Ridgeview Drive



1: S.R. 309 & Ridgeview Drive

Timing Plan: AM Peak Hour

Projected 2025 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	15	68	495	53	24	313	678	645	19	912	36
Future Volume (veh/h)	9	15	68	495	53	24	313	678	645	19	912	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	854	1794	1691	1724	1795	1652	1641	1514	1655	1949	1807	1707
Adj Flow Rate, veh/h	10	16	67	538	58	22	340	737	660	21	991	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	67	0	12	8	3	13	5	14	4	0	10	17
Cap, veh/h	223	459	573	398	317	120	342	842	732	132	1161	45
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.24	0.14	0.58	0.57	0.34	0.34	0.33
Sat Flow, veh/h	635	1794	1433	1279	1240	470	1562	1457	1268	425	3371	129
Grp Volume(v), veh/h	10	16	67	538	0	80	340	727	670	21	505	524
Grp Sat Flow(s),veh/h/ln	635	1794	1433	1279	0	1710	1562	1438	1286	425	1716	1784
Q Serve(g_s), s	1.1	0.6	2.6	22.4	0.0	3.3	12.9	38.9	41.5	4.1	24.6	24.6
Cycle Q Clear(g_c), s	3.9	0.6	2.6	23.0	0.0	3.3	12.9	38.9	41.5	24.1	24.6	24.6
Prop In Lane	1.00		1.00	1.00		0.28	1.00		0.99	1.00		0.07
Lane Grp Cap(c), veh/h	223	459	573	398	0	437	342	831	743	132	591	614
V/C Ratio(X)	0.04	0.03	0.12	1.35	0.00	0.18	0.99	0.88	0.90	0.16	0.85	0.85
Avail Cap(c_a), veh/h	223	459	573	398	0	437	342	831	743	132	591	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	25.2	17.0	36.1	0.0	26.3	21.0	16.2	17.2	36.5	27.4	27.4
Incr Delay (d2), s/veh	0.1	0.0	0.1	173.6	0.0	0.2	47.0	12.4	16.2	2.6	14.5	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3	0.5	1.5	42.6	0.0	2.4	12.6	18.3	18.6	0.9	16.7	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	25.2	17.1	209.7	0.0	26.5	68.1	28.7	33.4	39.0	41.9	41.5
LnGrp LOS	C	C	B	F	A	C	E	C	C	D	D	D
Approach Vol, veh/h		93			618			1737			1050	
Approach Delay, s/veh		19.6			186.0			38.2			41.7	
Approach LOS		B			F			D			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	21.0	39.0		30.0		60.0		30.0				
Change Period (Y+Rc), s	9.0	9.0		8.0		9.0		8.0				
Max Green Setting (Gmax), s	12.0	30.0		22.0		51.0		22.0				
Max Q Clear Time (g_c+I1), s	15.4	27.1		6.4		43.5		25.5				
Green Ext Time (p_c), s	0.0	1.6		0.3		4.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				64.9								
HCM 6th LOS				E								

2: Bulldog Drive & Ridgeview Drive

Timing Plan: AM Peak Hour
Projected 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖↗	↖↗	
Traffic Volume (vph)	366	313	8	399	173	1
Future Volume (vph)	366	313	8	399	173	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	10	13	10	10
Grade (%)	1%			-2%	1%	
Storage Length (ft)		0	450		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	148			414	1819	
Travel Time (s)	2.9			8.1	35.4	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	7%	12%	0%	5%	25%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

2: Bulldog Drive & Ridgeview Drive

Timing Plan: AM Peak Hour

Projected 2025 Conditions

Intersection						
Int Delay, s/veh	4.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕↕	↕↕	
Traffic Vol, veh/h	366	313	8	399	173	1
Future Vol, veh/h	366	313	8	399	173	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	450	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	-2	1	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	7	12	0	5	25	0
Mvmt Flow	416	356	9	453	197	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	772	0	839	594
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.3	-	6.9	6.3
Critical Hdwy Stg 1	-	-	-	-	5.975	-
Critical Hdwy Stg 2	-	-	-	-	6.375	-
Follow-up Hdwy	-	-	3	-	3.2	3.1
Pot Cap-1 Maneuver	-	-	647	-	320	525
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	811	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	647	-	314	525
Mov Cap-2 Maneuver	-	-	-	-	314	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	796	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		33.9	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	315	-	-	647	-	
HCM Lane V/C Ratio	0.628	-	-	0.014	-	
HCM Control Delay (s)	33.9	-	-	10.6	0.1	
HCM Lane LOS	D	-	-	B	A	
HCM 95th %tile Q(veh)	4	-	-	0	-	

3: Ridgeview Drive & Walbert Avenue

Timing Plan: AM Peak Hour

Projected 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	256	6	237	216	10	17	54	223	10	128	12
Future Volume (vph)	10	256	6	237	216	10	17	54	223	10	128	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	14	14	14	14
Grade (%)		-3%			2%			7%			-4%	
Storage Length (ft)	85		0	125		0	0		275	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		931			1894			1185			805	
Travel Time (s)		14.1			28.7			23.1			15.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	10%	8%	0%	7%	10%	10%	6%	6%	3%	20%	0%	8%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm		NA
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		3.0	3.0	3.0	3.0		3.0
Minimum Split (s)	24.0	24.0		17.0	17.0		10.0	10.0	10.0	10.0		10.0
Total Split (s)	37.0	37.0		37.0	37.0		23.0	23.0	23.0	23.0		23.0
Total Split (%)	61.7%	61.7%		61.7%	61.7%		38.3%	38.3%	38.3%	38.3%		38.3%
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	0.0				-1.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0				5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min		Min	Min		None	None	None	None		None

Intersection Summary
 Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 39.3
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated





















Splits and Phases: 3: Ridgeview Drive & Walbert Avenue



3: Ridgeview Drive & Walbert Avenue

Timing Plan: AM Peak Hour

Projected 2025 Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	256	6	237	216	10	17	54	223	10	128	12
Future Volume (veh/h)	10	256	6	237	216	10	17	54	223	10	128	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1770	1798	1912	1679	1637	1637	1442	1442	1544	1731	2027	1909
Adj Flow Rate, veh/h	11	294	5	272	248	9	20	62	186	11	147	11
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	10	8	0	7	10	10	6	6	3	20	0	8
Cap, veh/h	636	839	14	591	747	27	160	267	255	119	396	28
Arrive On Green	0.48	0.48	0.45	0.48	0.48	0.45	0.19	0.22	0.19	0.19	0.22	0.19
Sat Flow, veh/h	1121	1763	30	1024	1570	57	167	1201	1308	60	1782	128
Grp Volume(v), veh/h	11	0	299	272	0	257	82	0	186	169	0	0
Grp Sat Flow(s),veh/h/ln	1121	0	1793	1024	0	1627	1368	0	1308	1970	0	0
Q Serve(g_s), s	0.2	0.0	3.8	8.1	0.0	3.6	0.0	0.0	4.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.3	0.0	3.8	11.4	0.0	3.6	1.7	0.0	4.9	2.7	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.04	0.24		1.00	0.07		0.07
Lane Grp Cap(c), veh/h	636	0	853	591	0	774	389	0	255	489	0	0
V/C Ratio(X)	0.02	0.00	0.35	0.46	0.00	0.33	0.21	0.00	0.73	0.35	0.00	0.00
Avail Cap(c_a), veh/h	1057	0	1526	976	0	1385	744	0	611	1015	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.8	0.0	6.0	9.4	0.0	6.0	11.8	0.0	13.8	12.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.6	0.0	0.2	0.3	0.0	4.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.1	0.0	1.2	1.9	0.0	1.0	0.8	0.0	2.5	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.8	0.0	6.3	9.9	0.0	6.2	12.1	0.0	17.8	12.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		310			529			268			169	
Approach Delay, s/veh		6.3			8.1			16.0			12.5	
Approach LOS		A			A			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.3		13.1		23.3		13.1				
Change Period (Y+Rc), s		7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s		30.0		17.0		30.0		17.0				
Max Q Clear Time (g_c+I1), s		5.8		6.9		13.9		4.7				
Green Ext Time (p_c), s		1.6		0.7		2.4		0.6				
Intersection Summary												
HCM 6th Ctrl Delay				9.9								
HCM 6th LOS				A								

4: Bulldog Drive & Crackersport Road

Timing Plan: AM Peak Hour

Projected 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	↖
Traffic Volume (vph)	93	68	3	51	93	9
Future Volume (vph)	93	68	3	51	93	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	14	11	15	13	13
Grade (%)	-3%			2%	3%	
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			35	25	
Link Distance (ft)	1819			992	325	
Travel Time (s)	49.6			19.3	8.9	
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Heavy Vehicles (%)	9%	0%	0%	15%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

4: Bulldog Drive & Crackersport Road

















Timing Plan: AM Peak Hour

Projected 2025 Conditions

Intersection						
Int Delay, s/veh	3.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	93	68	3	51	93	9
Future Vol, veh/h	93	68	3	51	93	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-3	-	-	2	3	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	9	0	0	15	0	0
Mvmt Flow	145	106	5	80	145	14
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	251	0	288	198
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	90	-
Critical Hdwy	-	-	4.3	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	985	-	771	883
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	1072	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	985	-	767	883
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	1067	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		10.8	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	776	-	-	985	-	
HCM Lane V/C Ratio	0.205	-	-	0.005	-	
HCM Control Delay (s)	10.8	-	-	8.7	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.8	-	-	0	-	

5: Site Driveway/Winchester Road & Crackersport Road

Timing Plan: AM Peak Hour
Projected 2025 Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	37	0	63	23	9	9	48	49	10	55	10
Future Volume (vph)	4	37	0	63	23	9	9	48	49	10	55	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	12	12	16	16	12	12	12	12	12	12
Grade (%)		0%			-1%			0%			-2%	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		347			1175			340			531	
Travel Time (s)		6.8			22.9			9.3			14.5	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.93	0.93	0.92	0.92	0.92	0.93	0.92	0.93
Heavy Vehicles (%)	33%	14%	2%	2%	27%	22%	2%	2%	2%	0%	2%	10%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

5: Site Driveway/Winchester Road & Crackersport Road













Timing Plan: AM Peak Hour

Projected 2025 Conditions

Intersection												
Int Delay, s/veh	7.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	37	0	63	23	9	9	48	49	10	55	10
Future Vol, veh/h	4	37	0	63	23	9	9	48	49	10	55	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-1	-	-	0	-	-	-2	-
Peak Hour Factor	93	93	92	92	93	93	92	92	92	93	92	93
Heavy Vehicles, %	33	14	2	2	27	22	2	2	2	0	2	10
Mvmt Flow	4	40	0	68	25	10	10	52	53	11	60	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	35	0	0	40	0	0	250	219	40	267	214	30
Stage 1	-	-	-	-	-	-	48	48	-	166	166	-
Stage 2	-	-	-	-	-	-	202	171	-	101	48	-
Critical Hdwy	4.6	-	-	4.3	-	-	7.12	6.52	6.22	6.7	6.12	6.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	5.7	5.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	5.7	5.12	-
Follow-up Hdwy	3.3	-	-	3	-	-	3	4.018	3.1	3	4.018	3.2
Pot Cap-1 Maneuver	1060	-	-	1163	-	-	811	679	1103	814	700	1084
Stage 1	-	-	-	-	-	-	1128	855	-	988	775	-
Stage 2	-	-	-	-	-	-	925	757	-	1066	859	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1060	-	-	1163	-	-	711	636	1103	691	655	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	711	636	-	691	655	-
Stage 1	-	-	-	-	-	-	1123	852	-	984	729	-
Stage 2	-	-	-	-	-	-	790	712	-	949	856	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			5.5			10.3			10.9		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	800	1060	-	-	1163	-	-	696				
HCM Lane V/C Ratio	0.144	0.004	-	-	0.059	-	-	0.117				
HCM Control Delay (s)	10.3	8.4	0	-	8.3	0	-	10.9				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0.4				

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour
 Projected 2025 Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	124	175	317	344	64
Future Volume (vph)	21	124	175	317	344	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			1%	-2%	
Storage Length (ft)	0	55	225		225	
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	33%	6%	22%	10%	5%	3%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

















Timing Plan: AM Peak Hour

Projected 2025 Conditions

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	124	175	317	344	64
Future Vol, veh/h	21	124	175	317	344	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	55	225	-	-	225
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	1	-2	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	33	6	22	10	5	3
Mvmt Flow	28	163	230	417	453	84
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1330	453	453	0	-	0
Stage 1	453	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Critical Hdwy	6.73	6.26	4.5	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.3	3.2	3.2	-	-	-
Pot Cap-1 Maneuver	157	622	776	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	111	622	776	-	-	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.9	4.1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	776	-	111	622	-	-
HCM Lane V/C Ratio	0.297	-	0.249	0.262	-	-
HCM Control Delay (s)	11.6	-	47.9	12.8	-	-
HCM Lane LOS	B	-	E	B	-	-
HCM 95th %tile Q(veh)	1.2	-	0.9	1	-	-

7: Springhouse Road & Winchester Road

Timing Plan: AM Peak Hour
Projected 2025 Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	69	18	78	34	11	11	169	124	13	354	20
Future Volume (vph)	26	69	18	78	34	11	11	169	124	13	354	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	16	16	12	12	12	12	12	12
Grade (%)		-1%			-1%			2%			-1%	
Link Speed (mph)		25			35			30			30	
Link Distance (ft)		451			575			1861			726	
Travel Time (s)		12.3			11.2			42.3			16.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	10%	0%	14%	8%	0%	33%	0%	7%	6%	0%	4%	0%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

7: Springhouse Road & Winchester Road

Timing Plan: AM Peak Hour

Projected 2025 Conditions

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	69	18	78	34	11	11	169	124	13	354	20
Future Vol, veh/h	26	69	18	78	34	11	11	169	124	13	354	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	10	0	14	8	0	33	0	7	6	0	4	0
Mvmt Flow	29	77	20	87	38	12	12	188	138	14	393	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.2	11.5	13	16.6
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	23%	63%	3%
Vol Thru, %	56%	61%	28%	91%
Vol Right, %	41%	16%	9%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	304	113	123	387
LT Vol	11	26	78	13
Through Vol	169	69	34	354
RT Vol	124	18	11	20
Lane Flow Rate	338	126	137	430
Geometry Grp	1	1	1	1
Degree of Util (X)	0.483	0.22	0.241	0.623
Departure Headway (Hd)	5.147	6.297	6.355	5.216
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	696	568	562	688
Service Time	3.202	4.37	4.427	3.266
HCM Lane V/C Ratio	0.486	0.222	0.244	0.625
HCM Control Delay	13	11.2	11.5	16.6
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	2.6	0.8	0.9	4.4

1: S.R. 309 & Ridgeview Drive

Timing Plan: PM Peak Hour

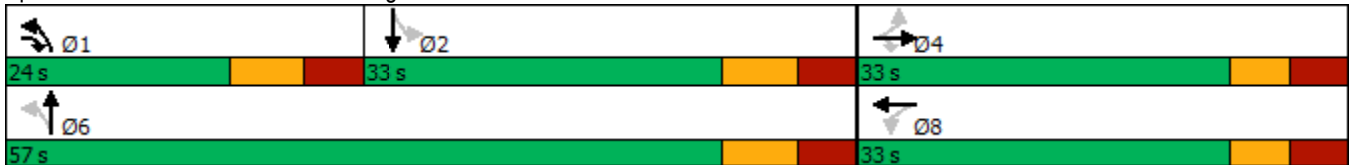
Projected 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	90	273	321	50	17	358	723	781	25	748	9
Future Volume (vph)	21	90	273	321	50	17	358	723	781	25	748	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	14	12	12	12	12	11	11	12	11	11
Grade (%)		1%			-1%			4%			-4%	
Storage Length (ft)	50		60	530		0	225		0	225		0
Storage Lanes	1		1	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			55			55	
Link Distance (ft)		276			148			1327			900	
Travel Time (s)		5.4			2.9			16.5			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	5%	4%	10%	3%	6%	3%	0%	4%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4	1		8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	8	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	15.0		15.0	15.0	
Minimum Split (s)	25.0	25.0	14.0	25.0	25.0		14.0	25.5		24.0	24.0	
Total Split (s)	33.0	33.0	24.0	33.0	33.0		24.0	57.0		33.0	33.0	
Total Split (%)	36.7%	36.7%	26.7%	36.7%	36.7%		26.7%	63.3%		36.7%	36.7%	
Yellow Time (s)	4.0	4.0	5.0	4.0	4.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	7.0	7.0	8.0	7.0	7.0		8.0	8.0		8.0	8.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Max		Max	Max	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Natural Cycle: 90
 Control Type: Semi Act-Uncoord























Splits and Phases: 1: S.R. 309 & Ridgeview Drive



1: S.R. 309 & Ridgeview Drive

Timing Plan: PM Peak Hour

Projected 2025 Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	90	273	321	50	17	358	723	781	25	748	9
Future Volume (veh/h)	21	90	273	321	50	17	358	723	781	25	748	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1794	1794	1852	1766	1780	1695	1669	1626	1669	1949	1892	1949
Adj Flow Rate, veh/h	23	98	249	349	54	14	389	786	790	27	813	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	5	4	10	3	6	3	0	4	0
Cap, veh/h	438	518	732	335	394	102	406	841	750	82	1010	12
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.28	0.18	0.54	0.53	0.28	0.28	0.27
Sat Flow, veh/h	1350	1794	1569	1030	1363	353	1589	1545	1378	358	3637	45
Grp Volume(v), veh/h	23	98	249	349	0	68	389	786	790	27	402	421
Grp Sat Flow(s),veh/h/ln	1350	1794	1569	1030	0	1717	1589	1545	1378	358	1798	1884
Q Serve(g_s), s	1.1	3.7	9.1	22.3	0.0	2.6	15.1	42.4	49.0	0.5	18.7	18.7
Cycle Q Clear(g_c), s	3.3	3.7	9.1	26.0	0.0	2.6	15.1	42.4	49.0	25.0	18.7	18.7
Prop In Lane	1.00		1.00	1.00		0.21	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	438	518	732	335	0	496	406	841	750	82	499	523
V/C Ratio(X)	0.05	0.19	0.34	1.04	0.00	0.14	0.96	0.93	1.05	0.33	0.80	0.80
Avail Cap(c_a), veh/h	438	518	732	335	0	496	406	841	750	82	499	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	24.1	15.2	36.5	0.0	23.8	19.8	19.0	21.0	45.0	30.2	30.2
Incr Delay (d2), s/veh	0.0	0.2	0.3	60.1	0.0	0.1	33.7	18.7	47.6	10.4	12.9	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	2.8	5.5	19.3	0.0	1.9	13.1	22.8	31.3	1.4	14.0	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.8	24.2	15.5	96.6	0.0	23.9	53.5	37.7	68.6	55.4	43.2	42.7
LnGrp LOS	C	C	B	F	A	C	D	D	F	E	D	D
Approach Vol, veh/h		370			417			1965			850	
Approach Delay, s/veh		18.4			84.8			53.2			43.3	
Approach LOS		B			F			D			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	24.0	33.0		33.0		57.0		33.0				
Change Period (Y+Rc), s	9.0	9.0		8.0		9.0		8.0				
Max Green Setting (Gmax), s	15.0	24.0		25.0		48.0		25.0				
Max Q Clear Time (g_c+I1), s	17.6	27.5		11.6		51.0		28.5				
Green Ext Time (p_c), s	0.0	0.0		1.2		0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				51.0								
HCM 6th LOS				D								

2: Bulldog Drive & Ridgeview Drive

Timing Plan: PM Peak Hour
 Projected 2025 Conditions



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔↔	↔↔	
Traffic Volume (vph)	736	160	5	264	125	6
Future Volume (vph)	736	160	5	264	125	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	10	13	10	10
Grade (%)	1%			-2%	1%	
Storage Length (ft)		0	450		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	148			414	1819	
Travel Time (s)	2.9			8.1	35.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	1%	9%	0%	3%	14%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized

2: Bulldog Drive & Ridgeview Drive

Timing Plan: PM Peak Hour

Projected 2025 Conditions

Intersection						
Int Delay, s/veh	3.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕↕	↕↕	
Traffic Vol, veh/h	736	160	5	264	125	6
Future Vol, veh/h	736	160	5	264	125	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	450	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	-2	1	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	9	0	3	14	0
Mvmt Flow	809	176	5	290	137	7
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	985	0	1052	897
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	155	-
Critical Hdwy	-	-	4.3	-	6.7	6.3
Critical Hdwy Stg 1	-	-	-	-	5.81	-
Critical Hdwy Stg 2	-	-	-	-	6.21	-
Follow-up Hdwy	-	-	3	-	3.1	3.1
Pot Cap-1 Maneuver	-	-	542	-	249	347
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	949	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	542	-	246	347
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	939	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.3	37.5			
HCM LOS			E			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	249	-	-	542	-	
HCM Lane V/C Ratio	0.578	-	-	0.01	-	
HCM Control Delay (s)	37.5	-	-	11.7	0.1	
HCM Lane LOS	E	-	-	B	A	
HCM 95th %tile Q(veh)	3.3	-	-	0	-	

3: Ridgeview Drive & Walbert Avenue

Timing Plan: PM Peak Hour

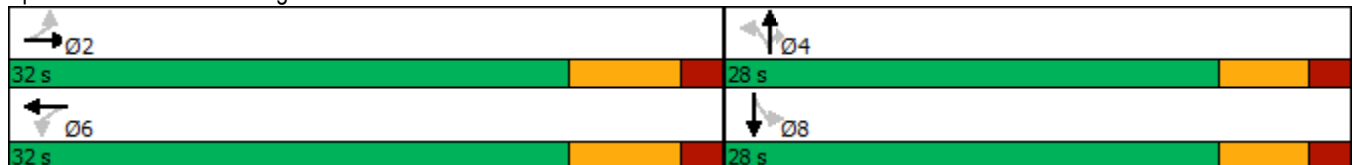
Projected 2025 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	297	8	201	308	39	17	282	338	16	31	3
Future Volume (vph)	17	297	8	201	308	39	17	282	338	16	31	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	12	12	12	12	12	12	14	14	14	14
Grade (%)		-3%			2%			7%			-4%	
Storage Length (ft)	85		0	125		0	0		275	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		931			1894			1185			805	
Travel Time (s)		14.1			28.7			23.1			15.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	2%	16%	0%	0%	2%	19%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4		4	8		
Detector Phase	2	2		6	6		4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	24.0	24.0		17.0	17.0		10.0	10.0	10.0	10.0	10.0	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%	46.7%	46.7%	46.7%	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	0.0			-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	6.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 44
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ridgeview Drive & Walbert Avenue



3: Ridgeview Drive & Walbert Avenue

Timing Plan: PM Peak Hour

Projected 2025 Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	297	8	201	308	39	17	282	338	16	31	3
Future Volume (veh/h)	17	297	8	201	308	39	17	282	338	16	31	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1912	1883	1912	1764	1750	1553	1527	1527	1558	1746	2027	2027
Adj Flow Rate, veh/h	18	313	6	212	324	35	18	297	293	17	33	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	1	2	16	0	0	2	19	0	0
Cap, veh/h	472	766	15	496	646	70	101	480	396	174	306	22
Arrive On Green	0.42	0.42	0.39	0.42	0.42	0.39	0.30	0.32	0.30	0.30	0.32	0.30
Sat Flow, veh/h	1103	1842	35	1056	1552	168	35	1482	1321	190	945	68
Grp Volume(v), veh/h	18	0	319	212	0	359	315	0	293	53	0	0
Grp Sat Flow(s),veh/h/ln	1103	0	1877	1056	0	1719	1517	0	1321	1203	0	0
Q Serve(g_s), s	0.5	0.0	5.1	7.3	0.0	6.5	0.0	0.0	8.4	0.1	0.0	0.0
Cycle Q Clear(g_c), s	6.5	0.0	5.1	11.9	0.0	6.5	7.6	0.0	8.4	7.7	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.10	0.06		1.00	0.32		0.06
Lane Grp Cap(c), veh/h	472	0	781	496	0	715	545	0	396	474	0	0
V/C Ratio(X)	0.04	0.00	0.41	0.43	0.00	0.50	0.58	0.00	0.74	0.11	0.00	0.00
Avail Cap(c_a), veh/h	691	0	1154	706	0	1057	876	0	687	798	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.3	0.0	8.7	12.7	0.0	9.2	12.3	0.0	13.3	10.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.6	0.0	0.5	1.0	0.0	2.7	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	0.0	2.4	2.3	0.0	2.9	3.9	0.0	4.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.4	0.0	9.0	13.2	0.0	9.7	13.2	0.0	16.0	10.3	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h		337			571			608				53
Approach Delay, s/veh		9.2			11.0			14.6				10.3
Approach LOS		A			B			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.6		18.7		23.6		18.7				
Change Period (Y+Rc), s		7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s		25.0		22.0		25.0		22.0				
Max Q Clear Time (g_c+I1), s		9.0		10.4		14.4		9.7				
Green Ext Time (p_c), s		1.5		2.3		2.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				12.0								
HCM 6th LOS				B								

4: Bulldog Drive & Crackersport Road

Timing Plan: PM Peak Hour

Projected 2025 Conditions

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (vph)	40	110	4	43	78	13
Future Volume (vph)	40	110	4	43	78	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	14	14	11	15	13	13
Grade (%)	-3%			2%	3%	
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			35	25	
Link Distance (ft)	1819			992	325	
Travel Time (s)	49.6			19.3	8.9	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

4: Bulldog Drive & Crackersport Road

















Timing Plan: PM Peak Hour

Projected 2025 Conditions

Intersection						
Int Delay, s/veh	3.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	40	110	4	43	78	13
Future Vol, veh/h	40	110	4	43	78	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-3	-	-	2	3	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	53	145	5	57	103	17
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	198	0	193	126
Stage 1	-	-	-	-	126	-
Stage 2	-	-	-	-	67	-
Critical Hdwy	-	-	4.3	-	7	6.5
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	3	-	3	3.1
Pot Cap-1 Maneuver	-	-	1028	-	893	976
Stage 1	-	-	-	-	1025	-
Stage 2	-	-	-	-	1103	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1028	-	889	976
Mov Cap-2 Maneuver	-	-	-	-	889	-
Stage 1	-	-	-	-	1025	-
Stage 2	-	-	-	-	1097	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	9.6			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	900	-	-	1028	-	
HCM Lane V/C Ratio	0.133	-	-	0.005	-	
HCM Control Delay (s)	9.6	-	-	8.5	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0	-	

5: Site Driveway/Winchester Road & Crackersport Road

Timing Plan: PM Peak Hour
Projected 2025 Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	42	0	62	37	10	10	45	46	9	54	3
Future Volume (vph)	7	42	0	62	37	10	10	45	46	9	54	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	12	12	16	16	12	12	12	12	12	12
Grade (%)		0%			-1%			0%			-2%	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		347			1175			340			531	
Travel Time (s)		6.8			22.9			9.3			14.5	
Peak Hour Factor	0.80	0.80	0.92	0.92	0.80	0.80	0.92	0.92	0.92	0.80	0.92	0.80
Heavy Vehicles (%)	0%	3%	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

5: Site Driveway/Winchester Road & Crackersport Road

Timing Plan: PM Peak Hour

Projected 2025 Conditions

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	42	0	62	37	10	10	45	46	9	54	3
Future Vol, veh/h	7	42	0	62	37	10	10	45	46	9	54	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-1	-	-	0	-	-	-2	-
Peak Hour Factor	80	80	92	92	80	80	92	92	92	80	92	80
Heavy Vehicles, %	0	3	2	2	0	0	2	2	2	0	2	0
Mvmt Flow	9	53	0	67	46	13	11	49	50	11	59	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	59	0	0	53	0	0	289	264	53	308	258	53
Stage 1	-	-	-	-	-	-	71	71	-	187	187	-
Stage 2	-	-	-	-	-	-	218	193	-	121	71	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.12	6.52	6.22	6.7	6.12	6
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	5.7	5.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	5.7	5.12	-
Follow-up Hdwy	3	-	-	3	-	-	3	4.018	3.1	3	4.018	3.1
Pot Cap-1 Maneuver	1146	-	-	1151	-	-	762	641	1084	767	665	1088
Stage 1	-	-	-	-	-	-	1095	836	-	964	761	-
Stage 2	-	-	-	-	-	-	906	741	-	1042	842	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1146	-	-	1151	-	-	668	597	1084	651	620	1088
Mov Cap-2 Maneuver	-	-	-	-	-	-	668	597	-	651	620	-
Stage 1	-	-	-	-	-	-	1086	829	-	956	715	-
Stage 2	-	-	-	-	-	-	779	697	-	928	835	-













Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.2			4.4			10.5			11.4		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	761	1146	-	-	1151	-	-	639
HCM Lane V/C Ratio	0.144	0.008	-	-	0.059	-	-	0.115
HCM Control Delay (s)	10.5	8.2	0	-	8.3	0	-	11.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0.4

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

Projected 2025 Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	23	87	84	517	486	37
Future Volume (vph)	23	87	84	517	486	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			-1%	-2%	
Storage Length (ft)	0	55	225			225
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	10%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

















Projected 2025 Conditions

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	87	84	517	486	37
Future Vol, veh/h	23	87	84	517	486	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	55	225	-	-	225
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	-1	-2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	10	0	0	1	1	0
Mvmt Flow	25	96	92	568	534	41
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1286	534	534	0	0	
Stage 1	534	-	-	-	-	
Stage 2	752	-	-	-	-	
Critical Hdwy	6.7	6.3	4.3	-	-	
Critical Hdwy Stg 1	5.5	-	-	-	-	
Critical Hdwy Stg 2	5.5	-	-	-	-	
Follow-up Hdwy	3.3	3.2	3	-	-	
Pot Cap-1 Maneuver	170	555	786	-	-	
Stage 1	610	-	-	-	-	
Stage 2	479	-	-	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	150	555	786	-	-	
Mov Cap-2 Maneuver	150	-	-	-	-	
Stage 1	539	-	-	-	-	
Stage 2	479	-	-	-	-	
Approach	EB	NB	SB			
HCM Control Delay, s	17.2	1.4	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	786	-	150	555	-	-
HCM Lane V/C Ratio	0.117	-	0.168	0.172	-	-
HCM Control Delay (s)	10.2	-	33.8	12.8	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.6	0.6	-	-

7: Springhouse Road & Winchester Road

Timing Plan: PM Peak Hour

Projected 2025 Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	52	11	200	80	47	31	374	128	13	279	21
Future Volume (vph)	18	52	11	200	80	47	31	374	128	13	279	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	16	16	16	16	16	16	12	12	12	12	12	12
Grade (%)		-1%			-1%			2%			-1%	
Link Speed (mph)		25			35			30			30	
Link Distance (ft)		451			575			1861			726	
Travel Time (s)		12.3			11.2			42.3			16.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	2%	1%	0%	1%	17%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

7: Springhouse Road & Winchester Road

Timing Plan: PM Peak Hour

Projected 2025 Conditions

Intersection	
Intersection Delay, s/veh	32.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	52	11	200	80	47	31	374	128	13	279	21
Future Vol, veh/h	18	52	11	200	80	47	31	374	128	13	279	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	3	0	2	1	0	1	17
Mvmt Flow	19	55	12	211	84	49	33	394	135	14	294	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.6	22.3	48.7	19.3
HCM LOS	B	C	E	C













Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	22%	61%	4%
Vol Thru, %	70%	64%	24%	89%
Vol Right, %	24%	14%	14%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	533	81	327	313
LT Vol	31	18	200	13
Through Vol	374	52	80	279
RT Vol	128	11	47	21
Lane Flow Rate	561	85	344	329
Geometry Grp	1	1	1	1
Degree of Util (X)	0.942	0.186	0.657	0.602
Departure Headway (Hd)	6.047	7.843	6.867	6.582
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	595	460	523	544
Service Time	4.126	5.843	4.953	4.677
HCM Lane V/C Ratio	0.943	0.185	0.658	0.605
HCM Control Delay	48.7	12.6	22.3	19.3
HCM Lane LOS	E	B	C	C
HCM 95th-tile Q	12.4	0.7	4.7	4

Springhouse Road & Crackersport Road
All-Way Stop Analysis

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour

Projected 2025 Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	124	175	317	344	64
Future Volume (vph)	21	124	175	317	344	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			1%	-2%	
Storage Length (ft)	0	55	225		225	
Storage Lanes	1	1	1		1	
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	33%	6%	22%	10%	5%	3%
Shared Lane Traffic (%)						
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: AM Peak Hour

Projected 2025 Conditions

Intersection	
Intersection Delay, s/veh	20.2
Intersection LOS	C













Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	21	124	175	317	344	64
Future Vol, veh/h	21	124	175	317	344	64
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles, %	33	6	22	10	5	3
Mvmt Flow	28	163	230	417	453	84
Number of Lanes	1	1	1	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	12.3	19.2	24.1
HCM LOS	B	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	317	21	124	344	64
LT Vol	175	0	21	0	0	0
Through Vol	0	317	0	0	344	0
RT Vol	0	0	0	124	0	64
Lane Flow Rate	230	417	28	163	453	84
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.432	0.7	0.065	0.304	0.773	0.126
Departure Headway (Hd)	6.754	6.04	8.405	6.71	6.15	5.406
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	532	596	426	534	588	661
Service Time	4.501	3.787	6.165	4.469	3.901	3.156
HCM Lane V/C Ratio	0.432	0.7	0.066	0.305	0.77	0.127
HCM Control Delay	14.6	21.7	11.8	12.4	26.9	8.9
HCM Lane LOS	B	C	B	B	D	A
HCM 95th-tile Q	2.2	5.6	0.2	1.3	7.1	0.4

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour
 Projected 2025 Conditions

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	23	87	84	517	486	37
Future Volume (vph)	23	87	84	517	486	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	10	10	11	11
Grade (%)	0%			-1%	-2%	
Storage Length (ft)	0	55	225			225
Storage Lanes	1	1	1			1
Taper Length (ft)	25		25			
Link Speed (mph)	35			30	30	
Link Distance (ft)	2308			1099	1861	
Travel Time (s)	45.0			25.0	42.3	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	10%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

6: Springhouse Road & Crackersport Road

Timing Plan: PM Peak Hour

Projected 2025 Conditions

Intersection	
Intersection Delay, s/veh	29.3
Intersection LOS	D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↖	↖	↗	↗	↖
Traffic Vol, veh/h	23	87	84	517	486	37
Future Vol, veh/h	23	87	84	517	486	37
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	10	0	0	1	1	0
Mvmt Flow	25	96	92	568	534	41
Number of Lanes	1	1	1	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	11	32	30
HCM LOS	B	D	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	84	517	23	87	486	37
LT Vol	84	0	23	0	0	0
Through Vol	0	517	0	0	486	0
RT Vol	0	0	0	87	0	37
Lane Flow Rate	92	568	25	96	534	41
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.155	0.88	0.057	0.178	0.844	0.056
Departure Headway (Hd)	6.064	5.575	8.09	6.687	5.691	4.966
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	593	653	443	536	636	721
Service Time	3.792	3.303	5.84	4.436	3.423	2.697
HCM Lane V/C Ratio	0.155	0.87	0.056	0.179	0.84	0.057
HCM Control Delay	9.9	35.6	11.3	10.9	31.7	8
HCM Lane LOS	A	E	B	B	D	A
HCM 95th-tile Q	0.5	10.5	0.2	0.6	9.3	0.2

APPENDIX H:

Critical and Follow-Up Headway Calculations

BOYC.00003

Ridgeview Drive & Bulldog Drive

Critical Headway

			tc base	tc hv	phv	t cg	G	t 3lt	Base Crit
major left	AM	WBL	4.3	1	0%	0	-2	0	4.3
	PM	WBL	4.3	1	0%	0	-2	0	4.3
minor right	AM	NBR	6.2	1	0%	0.1	1	0	6.3
	PM	NBR	6.2	1	0%	0.1	1	0	6.3
minor left	AM	NBL	7.1	1	25%	0.2	1	0.7	6.9
	PM	NBL	7.1	1	14%	0.2	1	0.7	6.7

Follow-up headway

			t fbase	t fhv	phv	Follow-up
major left	AM	WBL	3	0.9	0%	3.0
	PM	WBL	3	0.9	0%	3.0
minor right	AM	NBR	3.1	0.9	0%	3.1
	PM	NBR	3.1	0.9	0%	3.1
minor left	AM	NBL	3	0.9	25%	3.2
	PM	NBL	3	0.9	14%	3.1

BOYC.00003

Ridgeview Drive & Crackersport Road & Site Driveway

Critical Headway

			tc base	tc hv	phv	t cg	G	t 3lt	Base Crit
major left	AM	WBL	4.3	1	0%	0	2	0	4.3
	PM	WBL	4.3	1	0%	0	2	0	4.3
minor right	AM	NBR	6.2	1	0%	0.1	3	0	6.5
	PM	NBR	6.2	1	0%	0.1	3	0	6.5
minor left	AM	NBL	7.1	1	0%	0.2	3	0.7	7.0
	PM	NBL	7.1	1	0%	0.2	3	0.7	7.0

Follow-up headway

			t fbase	t fhv	phv	Follow-up
major left	AM	WBL	3	0.9	0%	3.0
	PM	WBL	3	0.9	0%	3.0
minor right	AM	NBR	3.1	0.9	0%	3.1
	PM	NBR	3.1	0.9	0%	3.1
minor left	AM	NBL	3	0.9	0%	3.0
	PM	NBL	3	0.9	0%	3.0

BOYC.00003

Crackersport Road & Winchester Road & Site Driveway

Critical Headway

			tc base	tc hv	phv	t cg	G	t 3lt	Base Crit
major left	AM	EBL	4.3	1	33%	0	0	0	4.6
	PM	EBL	4.3	1	0%	0	0	0	4.3
minor right	AM	SBR	6.2	1	10%	0.1	-2	0	6.1
	PM	SBR	6.2	1	0%	0.1	-2	0	6.0
minor left	AM	SBL	7.1	1	0%	0.2	-2	0.7	6.0
	PM	SBL	7.1	1	0%	0.2	-2	0.7	6.0

Follow-up headway

			t fbase	t fhv	phv	Follow-up
major left	AM	EBL	3	0.9	33%	3.3
	PM	EBL	3	0.9	0%	3.0
minor right	AM	SBR	3.1	0.9	10%	3.2
	PM	SBR	3.1	0.9	0%	3.1
minor left	AM	SBL	3	0.9	0%	3.0
	PM	SBL	3	0.9	0%	3.0

BOYC.00003

Crackersport Road & Winchester Road & Site Driveway (Projected Conditions)

Critical Headway

			tc base	tc hv	phv	t cg	G	t 3lt	Base Crit
Major left	AM	EBL	4.3	1	33%	0	0	0	4.6
	PM	EBL	4.3	1	0%	0	0	0	4.3
Major left	AM	WBL	4.3	1	2%	0	-1	0	4.3
	PM	WBL	4.3	1	2%	0	-1	0	4.3
Minor right	AM	NBR	6.2	1	2%	0.1	0	0	6.2
	PM	NBR	6.2	1	2%	0.1	0	0	6.2
Minor right	AM	SBR	6.2	1	10%	0.1	-2	0	6.1
	PM	SBR	6.2	1	0%	0.1	-2	0	6.0
Minor through	AM	NBT	6.5	1	2%	0.2	0	0	6.5
	PM	NBT	6.5	1	2%	0.2	0	0	6.5
Minor Through	AM	SBT	6.5	1	2%	0.2	-2	0	6.1
	PM	SBT	6.5	1	2%	0.2	-2	0	6.1
Minor left	AM	NBL	7.1	1	2%	0.2	0	0	7.1
	PM	NBL	7.1	1	2%	0.2	0	0	7.1
Minor left	AM	SBL	7.1	1	0%	0.2	-2	0	6.7
	PM	SBL	7.1	1	0%	0.2	-2	0	6.7

Follow-up headway

			t fbase	t fhv	phv	Follow-up
Major left	AM	EBL	3	0.9	33%	3.3
	PM	EBL	3	0.9	0%	3.0
Major left	AM	WBL	3	0.9	2%	3.0
	PM	WBL	3	0.9	2%	3.0
Minor right	AM	NBR	3.1	0.9	2%	3.1
	PM	NBR	3.1	0.9	2%	3.1
Minor right	AM	SBR	3.1	0.9	10%	3.2
	PM	SBR	3.1	0.9	0%	3.1
Minor through	AM	NBT	4	0.9	2%	4.0
	PM	NBT	4	0.9	2%	4.0
Minor Through	AM	SBT	4	0.9	2%	4.0
	PM	SBT	4	0.9	2%	4.0
Minor left	AM	NBL	3	0.9	2%	3.0
	PM	NBL	3	0.9	2%	3.0
Minor left	AM	SBL	3	0.9	0%	3.0
	PM	SBL	3	0.9	0%	3.0

BOYC.00003

Crackersport Road & Springhouse Road

Critical Headway

			tc base	tc hv	phv	t cg	G	t 3lt	Base Crit
major left	AM	NBL	4.3	1	22%	0	1	0	4.5
	PM	NBL	4.3	1	0%	0	1	0	4.3
minor right	AM	EBR	6.2	1	6%	0.1	0	0	6.3
	PM	EBR	6.2	1	0%	0.1	0	0	6.2
minor left	AM	EBL	7.1	1	33%	0.2	0	0.7	6.7
	PM	EBL	7.1	1	10%	0.2	0	0.7	6.5

Follow-up headway

			t fbase	t fhv	phv	Follow-up
major left	AM	NBL	3	0.9	22%	3.2
	PM	NBL	3	0.9	0%	3.0
minor right	AM	EBR	3.1	0.9	6%	3.2
	PM	EBR	3.1	0.9	0%	3.1
minor left	AM	EBL	3	0.9	33%	3.3
	PM	EBL	3	0.9	10%	3.1

APPENDIX I:

Auxiliary Lane Warrant Analysis

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="South Whitehall Township"/> County: <input type="text" value="Lehigh County"/> PennDOT Engineering District: <input type="text" value="5"/>	Analysis Date: <input type="text" value="1/19/2021"/> Conducted By: <input type="text" value="MJH"/> Checked By: <input type="text" value=""/> Agency/Company Name: <input type="text" value="Traffic Planning and Design, Inc."/>
Intersection & Approach Description: <input style="width: 100%;" type="text" value="Crackersport Road & Winchester Road/Site Driveway"/>	
Analysis Period: <input type="text" value="2025 Projected Conditions"/> Design Hour: <input type="text" value="AM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Rolling"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red; font-weight: bold;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Left Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	63	2.0%	65	Advancing Volume: <input type="text" value="110"/> Opposing Volume: <input type="text" value="51"/> Left Turn Volume: <input type="text" value="65"/>
	Through	-	23	27.0%	33	
	Right	Yes	9	22.0%	12	
Opposing	Left	Yes	4	33.0%	6	% Left Turns in Advancing Volume: <input type="text" value="59.09%"/>
	Through	-	37	14.0%	45	
	Right	Yes	0	0.0%	0	
Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	4	33.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Right Turn Volume: <input type="text" value="N/A"/>
	Through	-	37	14.0%	N/A	
	Right	-	0	0.0%	N/A	

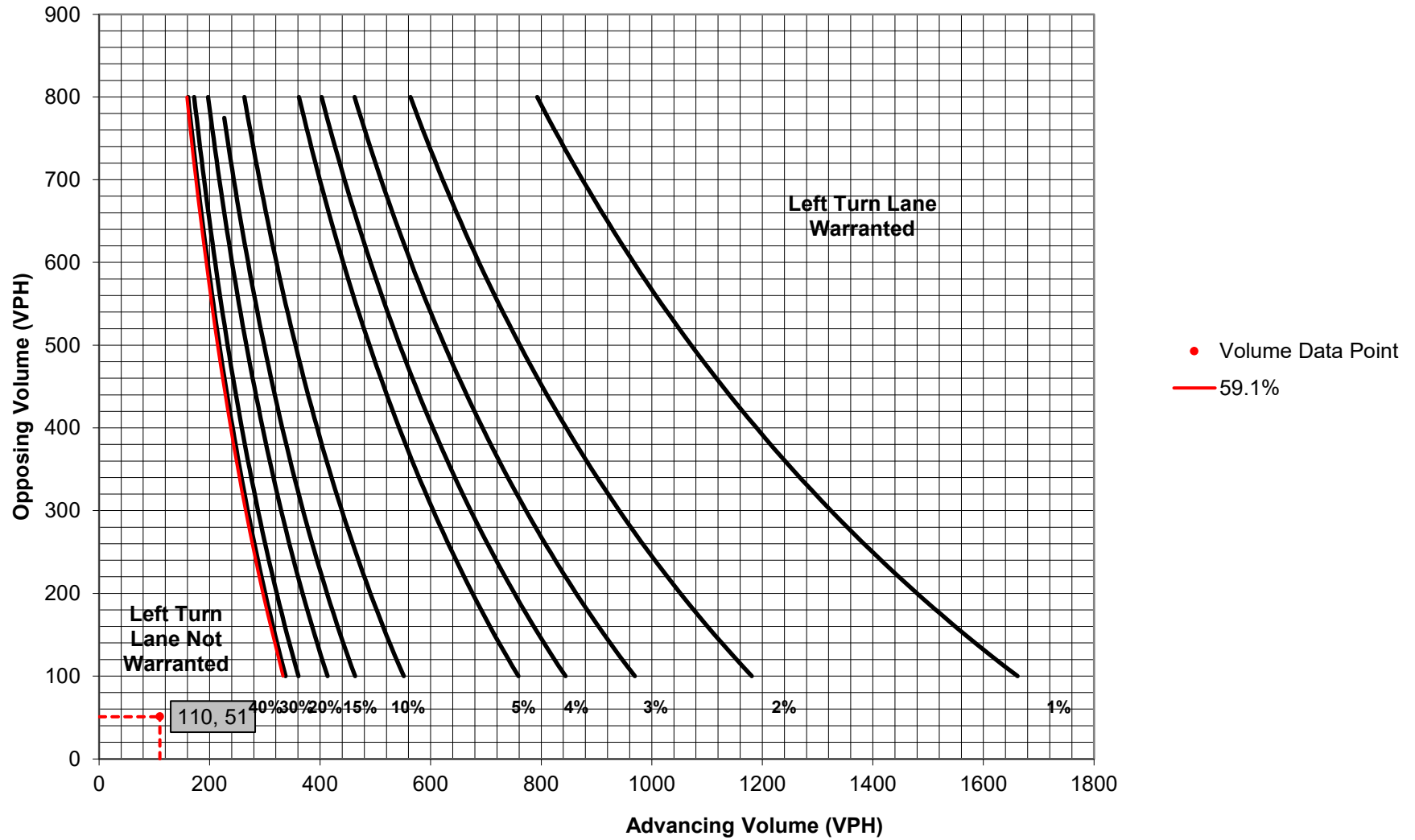
TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input style="width: 100px;" type="text" value="Figure 1"/> Warrant Met?: <input style="width: 100px;" type="text" value="No"/>	Applicable Warrant Figure: <input style="width: 100px;" type="text" value="N/A"/> Warrant Met?: <input style="width: 100px;" type="text" value="N/A"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="65"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value=""/>	Average # of Vehicles/Cycle: <input style="width: 100px;" type="text" value="N/A"/>																																								
PennDOT Publication 46, Exhibit 11-6																																									
<table border="1" style="width: 100%; border-collapse: collapse; font-size: 8px;"> <thead> <tr> <th rowspan="3" style="width: 20%;">Type of Traffic Control</th> <th colspan="6" style="background-color: #FFDAB9;">Speed (MPH)</th> </tr> <tr> <th colspan="2" style="background-color: #FFDAB9;">25-35</th> <th colspan="2" style="background-color: #FFDAB9;">40-45</th> <th colspan="2" style="background-color: #FFDAB9;">50-60</th> </tr> <tr> <th colspan="6" style="background-color: #FFDAB9;">Turn Demand Volume</th> </tr> <tr> <th></th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Signalized</td> <td style="text-align: center;">A</td> <td style="text-align: center;">A</td> <td style="text-align: center;">B or C</td> <td style="text-align: center;">B or C</td> <td style="text-align: center;">B or C</td> <td style="text-align: center;">B or C</td> </tr> <tr> <td style="text-align: center;">Unsignalized</td> <td style="text-align: center;">A</td> <td style="text-align: center;">A</td> <td style="text-align: center;">C</td> <td style="text-align: center;">B</td> <td style="text-align: center;">B or C</td> <td style="text-align: center;">B</td> </tr> </tbody> </table>		Type of Traffic Control	Speed (MPH)						25-35		40-45		50-60		Turn Demand Volume							High	Low	High	Low	High	Low	Signalized	A	A	B or C	B or C	B or C	B or C	Unsignalized	A	A	C	B	B or C	B
Type of Traffic Control	Speed (MPH)																																								
	25-35		40-45		50-60																																				
	Turn Demand Volume																																								
	High	Low	High	Low	High	Low																																			
Signalized	A	A	B or C	B or C	B or C	B or C																																			
Unsignalized	A	A	C	B	B or C	B																																			
Left Turn Lane Storage Length, Condition A: <input style="width: 100px;" type="text" value="N/A"/> Feet Condition B: <input style="width: 100px;" type="text" value="N/A"/> Feet Condition C: <input style="width: 100px;" type="text" value="N/A"/> Feet Required Left Turn Lane Storage Length: <input style="width: 100px;" type="text" value="N/A"/> Feet																																									
Additional Findings: <input style="width: 100px;" type="text" value="N/A"/>																																									
Additional Comments / Justifications: <input style="width: 100%; height: 40px;" type="text"/>																																									

Figure 1. Warrant for left turn lanes on two-lane roadways
 (speeds to 35 mph, unsignalized and signalized intersections)
 (L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="South Whitehall Township"/> County: <input type="text" value="Lehigh County"/> PennDOT Engineering District: <input type="text" value="5"/>	Analysis Date: <input type="text" value="1/19/2021"/> Conducted By: <input type="text" value="MJH"/> Checked By: <input type="text"/> Agency/Company Name: <input type="text" value="Traffic Planning and Design, Inc."/>
Intersection & Approach Description: <input type="text" value="Crackersport Road & Winchester Road/Site Driveway"/>	
Analysis Period: <input type="text" value="2025 Projected Conditions"/> Design Hour: <input type="text" value="AM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Rolling"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 2px solid red; padding: 2px; display: inline-block;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	63	2.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Opposing Volume: <input type="text" value="N/A"/> Left Turn Volume: <input type="text" value="N/A"/>
	Through	-	23	27.0%	N/A	
	Right	Yes	9	22.0%	N/A	
Opposing	Left	Yes	4	33.0%	N/A	% Left Turns in Advancing Volume: <input type="text" value="N/A"/>
	Through	-	37	14.0%	N/A	
	Right	Yes	0	0.0%	N/A	

Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	4	33.0%	6	Advancing Volume: <input type="text" value="51"/> Right Turn Volume: <input type="text" value="0"/>
	Through	-	37	14.0%	45	
	Right	-	0	0.0%	0	

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 9"/> Warrant Met?: <input type="text" value="No"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="0"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text"/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>
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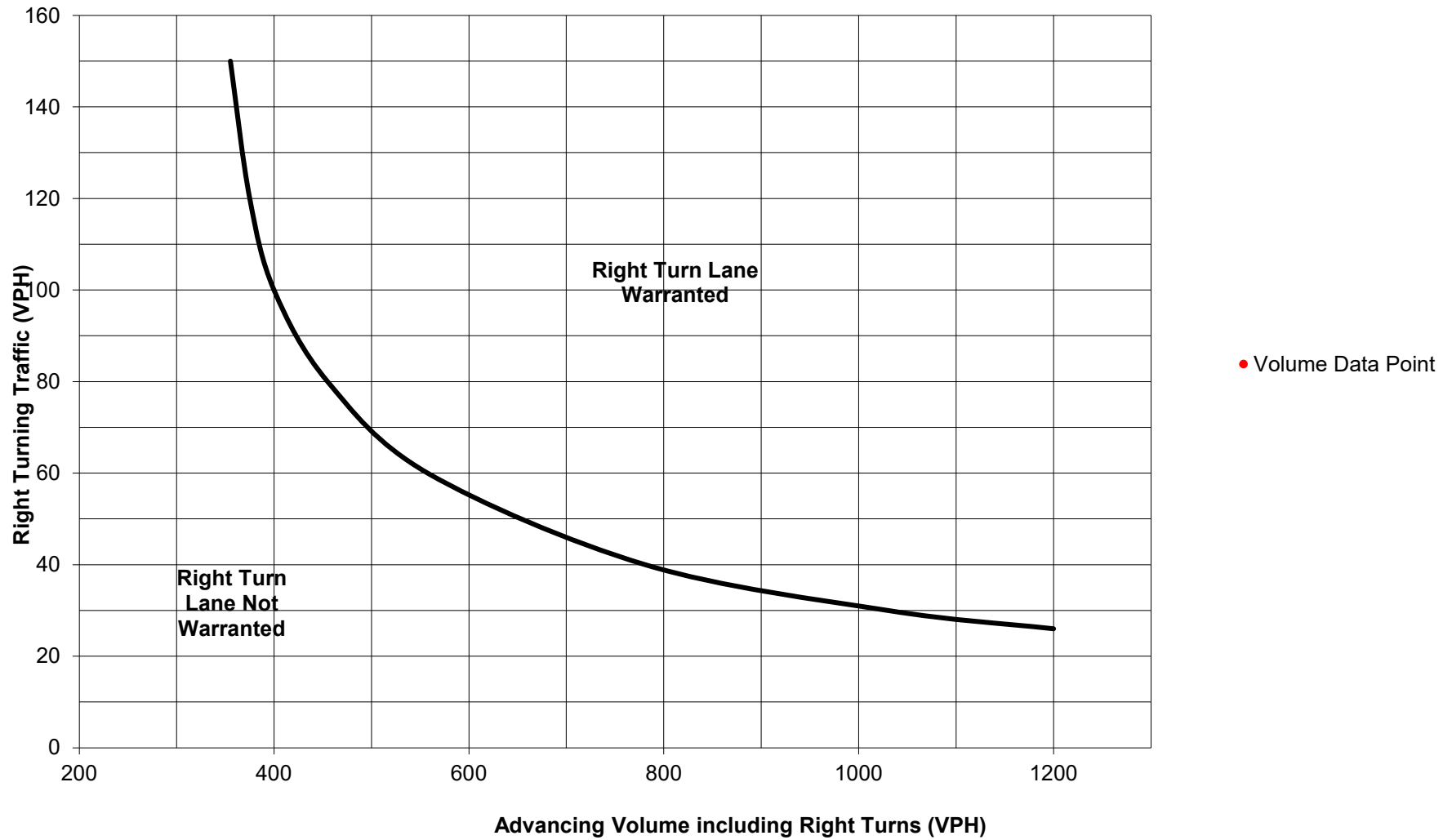
Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A: <input type="text" value="N/A"/> Feet Condition B: <input type="text" value="N/A"/> Feet Condition C: <input type="text" value="N/A"/> Feet Required Right Turn Lane Storage Length: <input type="text" value="N/A"/> Feet
--

Additional Findings:

Additional Comments / Justifications:

**Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)**



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="South Whitehall Township"/> County: <input type="text" value="Lehigh County"/> PennDOT Engineering District: <input type="text" value="5"/>	Analysis Date: <input type="text" value="11/17/2020"/> Conducted By: <input type="text" value="MJH"/> Checked By: <input type="text"/> Agency/Company Name: <input type="text" value="Traffic Planning and Design, Inc."/>
Intersection & Approach Description: <input type="text" value="Crackersport Road & Winchester Road/Site Driveway"/>	
Analysis Period: <input type="text" value="2025 Projected Conditions"/> Design Hour: <input type="text" value="AM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Rolling"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red; font-weight: bold;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Left Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	62	2.0%	64	Advancing Volume: <input type="text" value="111"/> Opposing Volume: <input type="text" value="51"/> Left Turn Volume: <input type="text" value="64"/>
	Through	-	37	0.0%	37	
	Right	Yes	10	0.0%	10	
Opposing	Left	Yes	7	0.0%	7	% Left Turns in Advancing Volume: <input type="text" value="57.66%"/>
	Through	-	42	3.0%	44	
	Right	Yes	0	0.0%	0	

Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	7	0.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Right Turn Volume: <input type="text" value="N/A"/>
	Through	-	42	3.0%	N/A	
	Right	-	0	0.0%	N/A	

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input style="width: 100px;" type="text" value="Figure 1"/> Warrant Met?: <input style="width: 100px;" type="text" value="No"/>	Applicable Warrant Figure: <input style="width: 100px;" type="text" value="N/A"/> Warrant Met?: <input style="width: 100px;" type="text" value="N/A"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control:	<input type="text" value="Unsignalized"/>
Design Hour Volume of Turning Lane:	<input type="text" value="64"/>
Cycles Per Hour (Assumed):	<input type="text" value="60"/>
Cycles Per Hour (If Known):	<input type="text"/>
Average # of Vehicles/Cycle:	<input type="text" value="N/A"/>

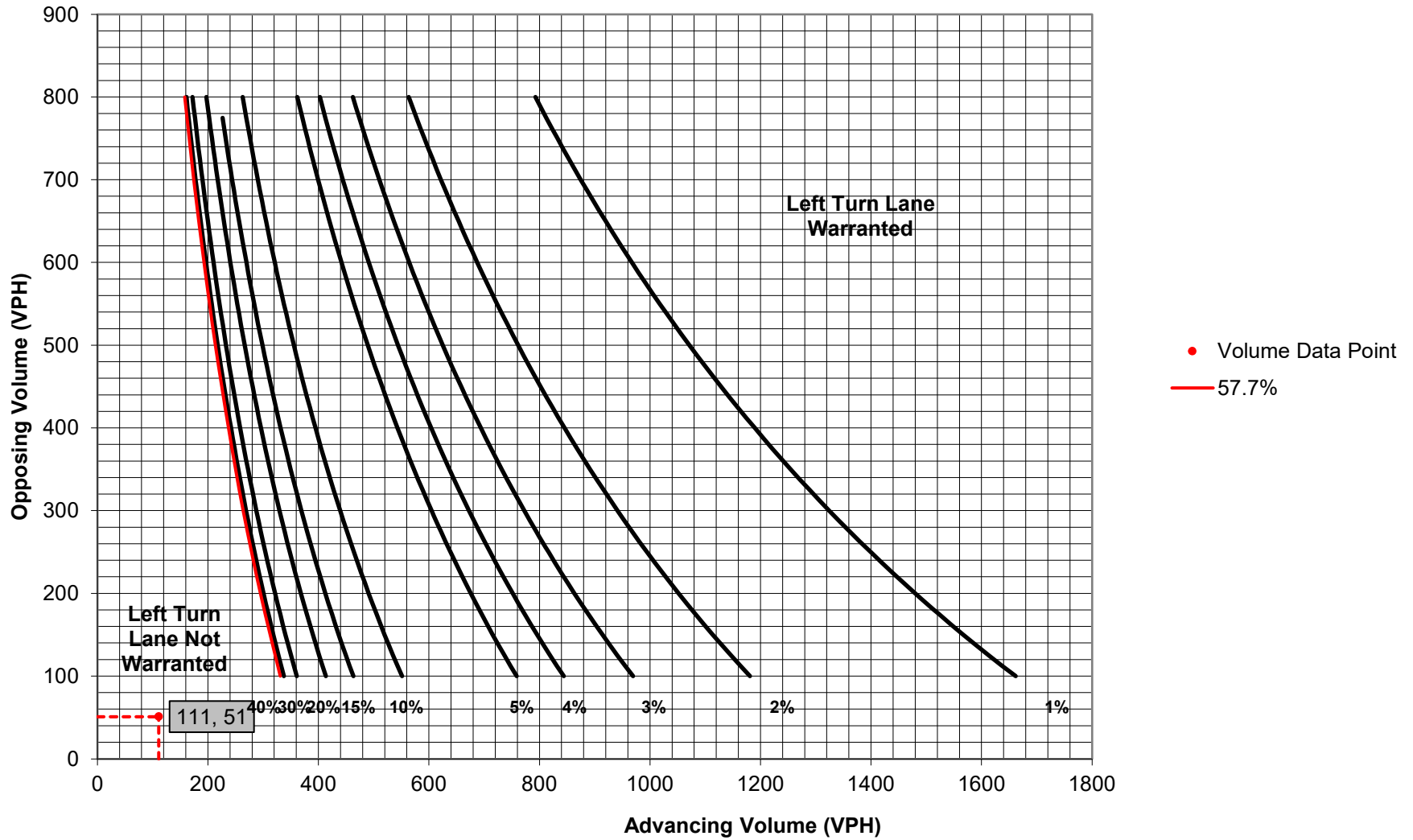
PennDOT Publication 46, Exhibit 11-6							
Speed (MPH)							
		25-35		40-45		50-60	
Turn Demand Volume							
	High	Low	High	Low	High	Low	
Signalized	A	A	B or C	B or C	B or C	B or C	
Unsignalized	A	A	C	B	B or C	B	

Left Turn Lane Storage Length, Condition A:	<input style="width: 100px;" type="text" value="N/A"/>	Feet
Condition B:	<input style="width: 100px;" type="text" value="N/A"/>	Feet
Condition C:	<input style="width: 100px;" type="text" value="N/A"/>	Feet
Required Left Turn Lane Storage Length:	<input style="width: 100px;" type="text" value="N/A"/>	Feet

Additional Findings:

Additional Comments / Justifications:

Figure 1. Warrant for left turn lanes on two-lane roadways
 (speeds to 35 mph, unsignalized and signalized intersections)
 (L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="South Whitehall Township"/> County: <input type="text" value="Lehigh County"/> PennDOT Engineering District: <input type="text" value="5"/>	Analysis Date: <input type="text" value="11/17/2020"/> Conducted By: <input type="text" value="MJH"/> Checked By: <input type="text" value=""/> Agency/Company Name: <input type="text" value="Traffic Planning and Design, Inc."/>
Intersection & Approach Description: <input type="text" value="Crackersport Road & Winchester Road/Site Driveway"/>	
Analysis Period: <input type="text" value="2025 Projected Conditions"/> Design Hour: <input type="text" value="AM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Rolling"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 2px solid red; padding: 2px; display: inline-block;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	62	2.0%	N/A	Advancing Volume: <input type="text" value="N/A"/> Opposing Volume: <input type="text" value="N/A"/> Left Turn Volume: <input type="text" value="N/A"/>
	Through	-	37	0.0%	N/A	
	Right	Yes	10	0.0%	N/A	
Opposing	Left	Yes	7	0.0%	N/A	% Left Turns in Advancing Volume: <input type="text" value="N/A"/>
	Through	-	42	3.0%	N/A	
	Right	Yes	0	0.0%	N/A	

Right Turn Lane Volume Calculations						
Movement	Include?	Volume	% Trucks	PCEV		
Advancing	Left	Yes	7	0.0%	7	Advancing Volume: <input type="text" value="51"/> Right Turn Volume: <input type="text" value="0"/>
	Through	-	42	3.0%	44	
	Right	-	0	0.0%	0	

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 9"/> Warrant Met?: <input type="text" value="No"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="0"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value=""/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>
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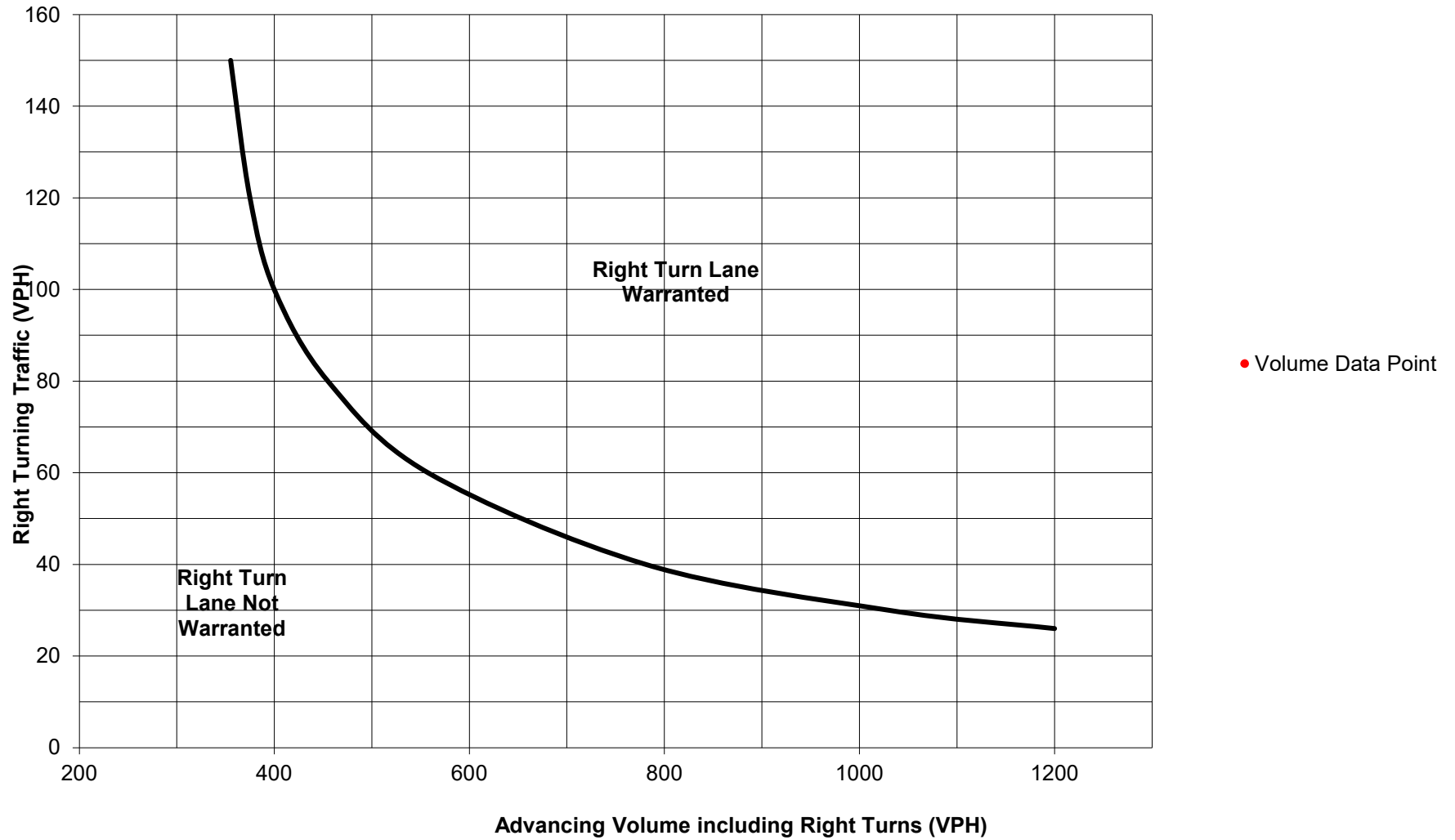
Type of Traffic Control	PennDOT Publication 46, Exhibit 11-6					
	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	<input type="text" value="N/A"/>	Feet
Condition B:	<input type="text" value="N/A"/>	Feet
Condition C:	<input type="text" value="N/A"/>	Feet
Required Right Turn Lane Storage Length:	<input type="text" value="N/A"/>	Feet

Additional Findings:

Additional Comments / Justifications:

**Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)**



EXECUTIVE SUMMARY

The purpose of this study is to examine the potential traffic impact associated with the proposed Parkview Inn redevelopment on the roadway network in South Whitehall Township, Lehigh County, PA. Based on this evaluation, the following conclusions were reached:

1. The project scope and the extent of the study area were confirmed with representatives from the Township via email correspondence. The study area intersections included in this TIS are as follows:
 - » Route 309 & Ridgeview Drive;
 - » Ridgeview Drive & Bulldog Drive;
 - » Ridgeview Drive & Walbert Avenue;
 - » Bulldog Drive & Crackersport Road;
 - » Crackersport Road & Winchester Road;
 - » Crackersport Road & Springhouse Road;
 - » Springhouse Road & Winchester Road.
2. The proposed project site is to be located on the property of the Parkview Inn. The proposed site is bound by Route 309 (S.R. 0309) to the west, Route 22 (S.R. 0022) to the south and Crackersport Road to the north.
3. The proposed mixed-use development will consist of the following land uses: 360 apartments, 35 low-rise townhomes, an 8,000 SF daycare facility and 15,540 square feet (SF) of retail space.
4. Access to the site will be served by two full-access driveways: one existing driveway at the intersection of Bulldog Drive and Crackersport Road and one proposed driveway on Crackersport Road aligned directly opposite Winchester Road.
5. Under the 2025 projected conditions all approaches and turning movements at the site driveway intersections with the external roadway network will operate at LOS B or better during weekday A.M. and weekday P.M. peak hours.
6. The available sight distance at the proposed new site driveway location will exceed PennDOT's desirable and safe stopping sight distance (SSSD) criteria.
7. Upon full build-out, the proposed development is expected to generate 330 new vehicle-trips during the weekday A.M. peak hour and 333 new vehicle-trips during the weekday P.M. peak hour.
8. All study area intersections will operate at an acceptable overall intersection level of service (ILOS) D or better under the 2025 projected condition scenarios with the exception of the intersection of Route 309 & Ridgeview Drive during the AM peak hour.
9. Traffic Planning and Design Inc. (TPD) recommends the following roadway improvements at the site access study area intersection with Crackersport Road:

Crackersport Road & Winchester Road/Proposed Full-Access Driveway

- » Provide a stop sign (PennDOT designation R1-1) to control traffic;
 - » Design the driveway with sufficient width and radii to accommodate the anticipated traffic utilizing the access.
10. TPD has prepared an all-way stop control warrant analysis for the intersection of Springhouse Road and Crackersport Road. Given the current configuration and the results of the all-way stop analysis

performed at the intersection of Springhouse Road & Crackersport Road, the Township may wish to consider pursuing the installation of all-way stop control at this intersection.

11. Levels of Service (LOS) for the study area intersections have been summarized in matrix form. **Table I** details the overall intersection LOS for each study area intersection.

TABLE I
LEVELS OF SERVICE (DELAY) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour			Weekday P.M. Peak Hour		
		Existing Conditions	Opening Year 2025		Existing Conditions	Opening Year 2025	
			Base	Projected		Base	Projected
Route 309 & Ridgeview Drive	EB L	C (23.2)	C (26.9)	C (27.6)	C (23.9)	C (24.3)	C (24.8)
	EB T	C (22.1)	C (25.1)	C (25.2)	C (24.1)	C (24.1)	C (24.2)
	EB R	B (15.0)	B (17.1)	B (17.1)	B (15.4)	B (15.5)	B (15.5)
	WB L	D (44.1)	F (133.2)	F (209.7)	D (36.3)	E (58.2)	F (96.6)
	WB TR	C (22.8)	C (26.1)	C (26.5)	C (23.7)	C (23.6)	C (23.9)
	NB L	C (23.3)	E (68.1)	E (68.1)	C (20.2)	D (53.5)	D (53.5)
	NB TR	C (26.2)	C (29.7)	C (33.4)	C (24.6)	D (45.2)	F (68.6)
	SB L	C (30.7)	C (34.2)	D (39.0)	C (30.7)	D (46.7)	E (55.4)
	SB TR	D (35.5)	D (41.9)	D (41.9)	C (28.6)	D (43.2)	D (43.2)
	ILOS	C (30.7)	D (50.8)	E (64.9)	C (25.0)	D (41.4)	D (51.0)
Ridgeview Drive & Bulldog Drive	WB L	B (10.1)	B (10.4)	B (10.6)	B (10.7)	B (11.2)	B (11.7)
	NB L/R	C (17.9)	C (21.0)	D (33.9)	C (19.2)	C (24.0)	E (37.5)
	ILOS	A (1.7)	A (1.9)	A (4.8)	A (1.5)	A (1.6)	A (3.9)
Walbert Avenue (S.R. 1006) & Ridgeview Drive	EB L	A (6.0)	A (6.8)	A (6.8)	B (10.5)	B (11.4)	B (11.4)
	EB TR	A (5.9)	A (6.3)	A (6.3)	A (8.6)	A (9.0)	A (9.0)
	WB L	A (7.9)	A (9.9)	A (9.9)	B (10.9)	B (13.2)	B (13.2)
	WB TR	A (5.7)	A (6.2)	A (6.2)	A (9.4)	A (9.7)	A (9.7)
	NB LT	B (10.2)	B (12.1)	B (12.1)	B (10.9)	B (13.2)	B (13.2)
	NB R	B (15.0)	B (17.8)	B (17.8)	B (11.2)	B (16.0)	B (16.0)
	SB L/T/R	B (10.7)	B (12.5)	B (12.5)	A (8.4)	B (10.3)	B (10.3)
	ILOS	A (8.5)	A (9.9)	A (9.9)	B (10.0)	B (12.0)	B (12.0)
Bulldog Drive & Crackersport Rod	WB L	A (8.4)	A (8.4)	A (8.7)	A (8.2)	A (8.2)	A (8.5)
	NB L/R	A (9.5)	A (9.5)	B (10.8)	A (8.8)	A (8.8)	A (9.6)
	ILOS	A (0.9)	A (0.9)	A (3.6)	A (2.0)	A (1.9)	A (3.1)
Crackersport Road & Winchester Road/ Proposed Site Driveway	EB L/T/R	A (8.4)	A (8.4)	A (8.4)	A (8.2)	A (8.2)	A (8.2)
	WB L/T/R	A (0.0)	A (0.0)	A (8.3)	A (0.0)	A (0.0)	A (8.3)
	NB L/T/R	--	--	B (10.3)	--	--	B (10.5)
	SB L/T/R	A (8.4)	A (8.4)	B (10.9)	A (8.6)	A (8.6)	B (11.4)
	ILOS	A (2.4)	A (2.3)	A (7.8)	A (1.6)	A (1.5)	A (7.1)
Crackersport Road & Springhouse Road	EB L	D (28.6)	D (32.4)	E (47.9)	C (24.2)	D (26.8)	D (33.8)
	EB R	B (11.6)	B (12.2)	B (12.8)	B (11.9)	B (12.3)	B (12.8)
	NB L	B (10.7)	B (11.0)	B (11.6)	A (9.8)	A (9.9)	B (10.2)
	NB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB T	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB R	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
ILOS	A (3.0)	A (3.0)	A (4.4)	A (1.3)	A (1.3)	A (2.2)	
Springhouse Road & Winchester Road	EB L/T/R	A (10.0)	B (10.3)	B (11.2)	B (10.9)	B (11.4)	B (12.6)
	WB L/T/R	B (10.5)	B (10.8)	B (11.5)	C (17.2)	C (18.9)	C (22.3)
	NB L/T/R	B (11.0)	B (11.8)	B (13.0)	D (26.0)	E (35.7)	E (48.7)
	SB L/T/R	B (12.8)	B (14.2)	C (16.6)	B (14.2)	C (16.0)	C (19.3)
	ILOS	B (11.6)	B (12.5)	B (14.1)	C (20.0)	D (25.3)	D (32.1)

Base = No-Build scenario / Projected = Build scenario,

Trip Generation Summary				
	Proposed Development	AM Peak	PM Peak	Daily
		374	379	3540
OPTION #1	Medical Office Buildings (182,400 SF)	381	620	6920
	Daycare (8,000SF)	88	89	382
	TOTAL	469	709	7302
OPTION #2	Extended Stay Hotel (324 rooms)	156	168	2022
	Fast food w/drive thru (4,800SF)	193	157	2262
	Retail Building (55,700SF)	52	212	2104
	Bank w/drive thru (4,500SF)	43	92	450
	TOTAL	444	629	6838
OPTION #3	Shopping Center (102,000SF)	96	389	3852
	Fast food w/drive thru (4,800SF)	193	157	2262
	General Office Building (86,000SF)	107	99	918
	Bank w/drive thru (2,500SF)	24	51	250
	TOTAL	420	696	7282
OPTION #4	Extended Stay Hotel (175 rooms)	84	91	1092
	Sit Down Restaurant (7,600SF)	76	74	854
	Retail/Commercial Bldg. (28,200SF)	27	107	1066
	Medical Office Building (106,000SF)	235	361	3984
	Bank w/drive thru (4,500SF)	43	92	450
	TOTAL	465	725	7446

BIZATI ALTERNATIVES ANALYSIS
LEVELS OF SERVICE (DELAY) SUMMARY

Intersection	Movement	Weekday A.M. Peak Hour					Weekday P.M. Peak Hour				
		Opening Year 2025					Opening Year 2025				
		TIS	Option 1	Option 2	Option 3	Option 4	TIS	Option 1	Option 2	Option 3	Option 4
Route 309 & Ridgeview Drive	EB L	C (27.6)	C (27.3)	C (27.5)	C (27.4)	C (27.3)	C (24.8)	C (26.1)	C (25.4)	C (25.6)	C (25.9)
	EB T	C (25.2)	C (25.3)	C (25.3)	C (25.3)	C (25.3)	C (24.2)	C (24.3)	C (24.3)	C (24.3)	C (24.3)
	EB R	B (17.1)	B (17.1)	B (17.1)	B (17.1)	B (17.1)	B (15.5)	B (15.5)	B (15.5)	B (15.5)	B (15.5)
	WB L	F (209.7)	F (216.7)	F (247.4)	F (228.9)	F (224.1)	F (96.6)	F (387.9)	F (261.4)	F (307.2)	F (349.1)
	WB TR	C (26.5)	C (26.3)	C (26.4)	C (26.4)	C (26.3)	C (23.9)	C (24.6)	C (24.2)	C (24.4)	C (24.5)
	NB L	E (68.1)	E (68.1)	E (68.1)	E (68.1)	E (68.1)	D (53.5)	D (53.5)	D (53.5)	D (53.5)	D (53.5)
	NB TR	C (33.4)	F (81.6)	F (59.5)	F (60.2)	F (75.5)	F (68.6)	F (87.3)	F (112.5)	F (115.7)	F (106.7)
	SB L	D (39.0)	E (56.5)	D (54.3)	D (54.3)	E (55.9)	E (55.4)	E (56.0)	E (59.1)	E (59.1)	E (58.4)
	SB TR	D (41.9)	D (41.9)	D (41.9)	D (41.9)	D (41.9)	D (43.2)	D (43.2)	D (43.2)	D (43.2)	D (43.2)
		ILOS	E (64.9)	E (75.4)	E (76.8)	E (73.3)	E (75.5)	D (51.0)	F (101.3)	F (83.7)	F (92.0)
Ridgeview Drive & Bulldog Drive	WB L	B (10.6)	B (11.6)	B (11.2)	B (11.2)	B (11.5)	B (11.7)	B (12.0)	B (12.3)	B (12.4)	B (12.2)
	NB L/R	D (33.9)	E (41.7)	F (51.3)	E (43.8)	E (44.4)	E (37.5)	F (394.4)	F (209.4)	F (283.5)	F (348.7)
		ILOS	A (4.8)	A (4.9)	A (7.5)	A (5.9)	A (5.6)	A (3.9)	F (95.2)	E (37.4)	F (55.9)