

7:00 p.m. Call to Order.

Invocation.

Pledge of Allegiance.

Roll Call.

Proclamations:

1. 2023 Fair Housing Month

A. Consent Agenda:

1. Approve the City Council Meeting Minutes of the:
 - a. Regular Meeting of March 7, 2023
2. Approve the Accounts Payable Register of March 21, 2023 as presented.
3. Accept for first reading an amendment to Chapter 66 of the Code of Ordinances (Streets, Sidewalks, & Other Public Places) include Sec. 66-7. "Block Parties," with final reading to occur April 4, 2023.
4. Receive Rezoning Application No. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex developments, and set a public hearing for April 18, 2023.
5. Receive a Tentative Plan and Rezoning Application No. 22/23-7 to rezone 412 West Centre Avenue and 7860 Shaver Road from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development, and set a public hearing for April 18, 2023.
6. Approve a five-year contract renewal with Veolia Water Contract Operations USA, Incorporated, for the provision of utility management and operation services for the period of July 1, 2023, through June 30, 2028, and authorize the City Manager to execute all documents related to the action on behalf of the city.
7. Approve the purchase of computing devices, monitors and accessories from CDW-G under the Michigan Master Computing MiDEAL competitive bid process in the amount of \$121,435.27 and authorize the City Manager to execute all documents related to this action.
8. Approve the FY 2021-22 Annual Action Plan Substantial Amendment and allocate \$110,341 to Housing Resources, Inc., to support housing stabilization due to COVID-19 for eviction prevention and rapid rehousing, and to allow families to remain in their homes.
9. Approve the selection of AVB, Inc., for a public-private partnership to develop a housing development at 9617 Portage Road and authorize the City Manager to commence negotiations related to the remaining elements of the development on behalf of the city.
10. Minutes of Boards & Commissions:
 - a. Zoning Board of Appeals of January 9, 2023
 - b. Human Services Board of February 2, 2023
 - c. Environmental Board of February 8, 2023
 - d. Planning Commission of February 16, 2023
11. Materials Transmitted.
12. Calendar of Meetings:
 - Board of Review on Tuesday, March 28, 2023 at 9:00 a.m. at City Hall.

B. Petitions and Statements of Citizens:

- C. Communications:
 - D. Public Hearings:
 - E. Regular Business Agenda:
 - F. Unfinished Business:
 - G. Council Committee Reports:
 - H. New Business:
 - I. Statements of Citizens:
 - J. Statements of City Council and City Manager.
- Adjournment.



CITY OF PORTAGE PROCLAMATION

FAIR HOUSING RESOLUTION

WHEREAS, 2023 is the 55th anniversary of the Federal Fair Housing Act, Title VIII of the Civil Rights Act of 1968, as amended, to prohibit housing discrimination when based on race or color, national origin, religion, sex, familial status or disability, and declared that equal housing opportunity is a basic right of every American; and

WHEREAS, The Michigan State Legislature passed the Elliot-Larsen Civil Rights Act of Michigan in 1976 to protect people from housing discrimination based on religion, color, race, national origin, age, sex, familial status or marital status; and

WHEREAS, The Michigan State Legislature passed the Michigan Persons with Disabilities Civil Rights Law of 1976 to protect individuals with disabilities from housing discrimination; and

WHEREAS, The City of Portage passed a Non-Discrimination Ordinance in 2016 to prohibit housing discrimination based on their actual or perceived race, color, religion, national origin, sex, height, weight, marital status, physical or mental disability, family status, sexual orientation or gender identity, and has completed an Analysis of Impediments to Fair Housing, and annually undertakes activities to further fair housing efforts and educate the public on fair housing issues; and

WHEREAS, Equal housing opportunity is a goal to be achieved within the City of Portage.

NOW, THEREFORE, BE IT RESOLVED THAT I, Patricia M. Randall, by virtue of the authority vested in me as the Mayor of Portage Michigan, do hereby resolve the month of April 2023, as **FAIR HOUSING MONTH** in hope that this observance will promote fair housing practices throughout the City.

Signed this 21st day of March, 2023

Patricia M. Randall, Mayor

CITY COUNCIL MEETING MINUTES FROM MARCH 7, 2023

Mayor Patricia Randall called the Regular Meeting to order at 07:00 PM in the Council Chambers at Portage City Hall.

ROLL CALL: Councilmembers Lisa Brayton, Chris Burns, Victor Ledbetter, Terry Urban, Mayor Pro Tem Jim Pearson, and Mayor Patricia Randall were present.

ABSENT: Councilmember Lori Knapp.

ALSO PRESENT: City Manager Pat McGinnis, Deputy City Manager Adam Herringa, City Attorney Catherine Kaufman, and City Clerk Erica Eklov.

At the request of Mayor Randall, the audience observed a moment of silence to reflect on the 51 years of service by Meals on Wheels. Following the moment of silence, the City Council recited the Pledge of Allegiance.

PROCLAMATIONS:

March for Meals Month: Ms. Taylor Rossi, on behalf of Milestone Senior Services of Kalamazoo, read the proclamation.

CONSENT AGENDA: Mayor Randall shared where the public can access the meeting agenda and asked if any Councilmember or anyone in the audience would like an item removed from the Consent Agenda. Seeing no comments, motion by Pearson, seconded by Ledbetter, to approve the Consent Agenda as presented. Upon a roll call vote, motion carried 6 to 0.

Approval of Minutes: Motion by Pearson, seconded by Ledbetter, to approve the City Council Meeting Minutes of the Regular Meeting of February 21, 2023. Upon a roll call vote, motion carried 6 to 0.

Accounts Payable Register: Motion by Pearson, seconded by Ledbetter, to approve the Accounts Payable Register of March 7, 2023, as presented. Upon a roll call vote, motion carried 6 to 0.

Two Senior Center Busses: Motion by Pearson, seconded by Ledbetter, to approve the single-source purchase of two 14-passenger transport vehicles from Best Bus Sales of Des Plaines, Illinois, in the amount of \$242,880 and authorize the City Manager to execute all documents related to this action on behalf of the city. Upon a roll call vote, motion carried 6 to 0.

South 12th Street Block Lift Station Renovation Project - Tabulation of Proposals: Motion by Pearson, seconded by Ledbetter, to award a contract to Abonmarche Consultants, Incorporated of Kalamazoo, Michigan, in the amount not to exceed \$174,130 to perform engineering services for the South 12th Street Block Lift Station Renovation Project and authorize the City Manager to execute all documents related to the contract on behalf of the city. Upon a roll call vote, motion carried 6 to 0.

Approval and acceptance of public improvements in the condominium project for Pennridge Trail PD Phase 3.: Motion by Pearson, seconded by Ledbetter, to approve and accept public improvements at the condominium project for Pennridge Trail PD Phase 3, 1850 West Osterhout Avenue, subject to sidewalks, street trees, stop signs, and bike path pavement to be completed by March 7, 2025. Upon a roll call vote, motion carried 6 to 0.

Fiscal Year 2023-2024 Proposed Budget Review Schedule: Motion by Pearson, seconded by Ledbetter, to establish April 18, 2023, from 3:00 to 6:30 p.m. and April 25, 2023, from 3:00 to 6:30 p.m.

(if needed) as the dates for review of the proposed Fiscal Year 2023-2024 Budget. Upon a roll call vote, motion carried 6 to 0.

Board & Commission Interview Session: Motion by Pearson, seconded by Ledbetter, to set a Special Meeting on Tuesday, May 23, 2023, beginning at 5:45 p.m., to interview Board and Commission applicants. Upon a roll call vote, motion carried 6 to 0.

Minutes of Boards & Commissions: Motion by Pearson, seconded by Ledbetter, to receive the Minutes of the Senior Citizens Advisory Board of November 16, 2022, and Planning Commission of January 19, 2023. Upon a roll call vote, motion carried 6 to 0.

Calendar of Meetings: Motion by Pearson, seconded by Ledbetter, to receive the Calendar of Meetings as presented. Upon a roll call vote, motion carried 6 to 0.

PETITIONS AND STATEMENTS OF CITIZENS: Alan Loveridge (23965 88th Avenue, Marcellus) spoke regarding illegal cashier check payments in relation to large purchases and potential recommendations to address this issue.

Robert Williams (10930 South Westnedge Avenue) began by thanking the city for quickly addressing his prior complaint about a pothole adjacent to his residence. He then expressed concern regarding the volume of development within the city and its potential stress on the water and sewer systems. Mayor Randall asked the City Manager to arrange a meeting with Mr. Williams to discuss his concerns.

PUBLIC HEARINGS:

Austin Lake Aquatic Plant Management Special Assessment - Resolution No. 5: Mayor Randall opened the public hearing at 7:19 p.m. There being no public comments, motion by Burns, seconded by Brayton, to close the public hearing. Upon a voice vote, motion carried 6 to 0.

Councilmember Urban asked the consultant from Progressive AE, Mr. Paul Hausler, whether the bid for the aquatic plant management was lower than expected. Mr. Hausler answered that the bid was in line with other recent projects. Councilmember Urban then inquired whether the special assessment funds will be sufficient to complete the project, to which Mr. Hausler confirmed funds would be sufficient. Councilmember Urban noted that any remaining assessment fund will either be returned to the residents or used for additional lake treatment if desired by the City Council at that time. He further confirmed that the lake weed treatment plan was for a very targeted portion of the lake and not the entire water body.

Motion by Burns, seconded by Brayton, to adopt Resolution No. 5, confirming the Special Assessment Roll for the Austin Lake Aquatic Plant Management Special Assessment District No. 023-A; and, award a contract to Solitude Lake Management LLC, Little Rock, AR for the 2023-2027 Austin Lake Herbicide Application Program at a cost not to exceed \$117,455, and authorize the City Manager to execute all documents related to the contracts on behalf of the city. Upon a roll call vote, motion carried 6 to 0.

UNFINISHED BUSINESS:

2023 Fee Schedules: At the request of the Mayor, City Manager McGinnis summarized the revisions to the proposed fees as revised by Senior Citizen Services Director Kim Phillips following the City Council's concerns from December 2022. Motion by Burns, seconded by Brayton, to adopt the 2023 Proposed Senior Center Facility fees, as modified, to be effective April 1, 2023. Upon a roll call vote, motion carried 6 to 0.

COUNCIL COMMITTEE REPORTS: None.

STATEMENTS OF CITIZENS: Robert Williams (10930 South Westnedge Avenue) spoke regarding concerns about the condition of Ring Road and encouraged enforcement efforts by the city. He also expressed concerns about the appearance of the construction site for the Redwood residential development along Lovers Lane.

STATEMENTS OF CITY COUNCIL AND CITY MANAGER: Councilmember Brayton noted March as Colorectal Awareness Month, with the disease affecting one in 24 people, and encouraged regular screening. Councilmember Brayton then welcomed LifeEMS as the new ambulance service provider. She also issued a reminder of Spring Daylight Savings Time, closing with a statement of gratitude to Consumers Energy for its efforts to restore power following the February 22 ice storm.

Councilmember Burns issued kudos to the Departments of Public Safety and Public Works for coordination with the February ice storm. He thanked the city for the additional brush pickup, noting the city's Compost Site hours during the extra pickup. Councilmember Burns closed with a reminder that the annual spring city collection programs would be beginning soon as well.

Councilmember Ledbetter acknowledged Women's History Month and recognized former Mayor Betty Lee Ongley as one of three first female mayors in the State of Michigan. He also recognized Mayor Randall, Councilmember Brayton and Councilmember Knapp for their civil service. Councilmember Ledbetter then spoke regarding LifeEMS as an ambulance provider.

Councilmember Urban stated his recent travels had allowed him to miss much of the effects of the February ice storm and was able to return before the following February snowstorm.

City Manager McGinnis recognized Mr. Williams' earlier citizen comments and stated he looks forward to meeting with him to ensure the city is adhering to development standards.

Mayor Pro Tem Pearson no comments to add.

Mayor Randall highlighted March as National Reading Month, having had the opportunity to read to two young Portage classrooms. She then noted the Lending Hands organization and the services it offers. Mayor Randall also complimented the city's operating hours surrounding the February ice storm, commenting that she also was affected by the widespread power outages.

ADJOURNMENT. Mayor Randall adjourned the meeting at 07:47 PM.

Erica L. Eklov, City Clerk

TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: Accounts Payable Register

SUPPORTING PERSONNEL: Lauren VanderVeen, Finance Director

ACTION RECOMMENDED: Approve the Accounts Payable Register of March 21, 2023 as presented.

The City Council reviews and approves the bi-weekly Accounts Payable Register which includes automated clearing house payments, paper checks, auto-pay payments, electronic payments and credit card payments. The attached Accounts Payable Register covers the period February 26, 2023 through March 11, 2023 and notes \$234,899.04 in automated clearing house payments, \$316,253.17 in paper checks, \$61,382.71 in auto-pay payments, \$1,531,250.45 in electronic payments and \$16,457.83 in credit card payments (February) for a grand total of \$2,160,243.20.

FUNDING: Not Applicable

Attachments: 1. Accounts Payable Register of March 21, 2023

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 1 of 8

Check Type: ACH Transaction

Check Date	Check	Vendor Name	Description	Amount
03/03/2023	18849(A)	ABONMARCHE CONSULTANTS, INC	ENGINEERING SERVICES - MULT LOCATIONS	35,901.00
03/03/2023	18850(A)	ALL CITY MANAGEMENT SERVICES, INC.	CROSSING GUARD CONTRACT	4,289.04
03/03/2023	18851(A)	ALL-TRONICS, INC.	FIRE ALARM MONITORING	81.00
03/03/2023	18852(A)	AMAZON.COM SALES, INC.	AIR PURIFIERS-HR; FLASH DRIVE-PD; MISC SUP-PZSC	1,922.74
03/03/2023	18853(A)	AMERICAN SAFETY & FIRST AID	FIRST AID SUPPLIES	171.67
03/03/2023	18854(A)	AUNALYTICS INC	MONTHLY DISASTER RECOVERY SERVICES	1,442.00
03/03/2023	18855(A)	B S & A SOFTWARE	BS&A ONLINE BLDG/PERMITTING & SUPPORT	4,743.00
03/03/2023	18856(A)	C C I SOUTH, INC.	VIKING PHONE & INSTALL	725.00
03/03/2023	18857(A)	CAPITAL ADVANTAGE FUNDING LLC	EQUIPMENT & COPIER LEASE	8,801.15
03/03/2023	18858(A)	CHARTER COMMUNICATIONS	CABLE TV	493.86
03/03/2023	18859(A)	CLEANIT CORP	CAR WASHES	59.99
03/03/2023	18860(A)	CONKLIN, ALEXIS	PER DIEM - MPARKS CONFERENCE	96.00
03/03/2023	18861(A)	CONTINENTAL LINEN SERVICES	LINENS FOR SPECIAL EVENTS	210.24
03/03/2023	18862(A)	DELTA DENTAL PLAN OF MICHIGAN	DENTAL INSURANCE	19,146.45
03/03/2023	18863(A)	DEPATIE FLUID POWER CO., INC.	HYDRAULIC REPAIRS	135.99
03/03/2023	18864(A)	EARLE, SHELIA L	FITNESS INSTRUCTION	222.50
03/03/2023	18865(A)	GREATER KALAMAZOO UNITED WAY	UNITED WAY DONATIONS FOR FEBRUARY 2023	75.78
03/03/2023	18866(A)	GRIFFIN PEST SOLUTIONS	PEST CONTROL SERVICES	161.00
03/03/2023	18867(A)	GRYPHON PLACE	FY 22-23 HUMAN SERVICES BOARD	1,850.00
03/03/2023	18868(A)	HERTZ, SHANNON	REIMB FOR OUT OF TOWN CANDIDATE DRUG TEST	49.00
03/03/2023	18869(A)	HOLCOMB, JOSHUA	VALENTINE LUNCH PERFORMANCE-PZSC	150.00
03/03/2023	18870(A)	INSIGHT PUBLIC SECTOR, INC.	MAAS360 SOFTWARE RENEWAL	7,287.06
03/03/2023	18871(A)	KAHN, WILMA	WRITING CLASS INSTRUCTION	348.00
03/03/2023	18872(A)	KURZAVA, MATTHEW STEPHEN	FITNESS CLASSES	300.00
03/03/2023	18873(A)	LAWSON PRODUCTS, INC	BUILDING MAINTENANCE SUPPLIES	891.05
03/03/2023	18874(A)	LENDING HANDS OF MICHIGAN, INC.	FY 22-23 HUMAN SERVICES BOARD	2,500.00
03/03/2023	18875(A)	LRE	BISHOPS BOG BOARDWALK SURVEYING	2,600.00
03/03/2023	18876(A)	MACQUEEN EQUIPMENT LLC	PELICAN SWEEPER BROOM REPAIRS	144.44
03/03/2023	18877(A)	MARTIN, MATTHEW	PER DIEM-FORENSIC W/DEATH INVESTIGATION	339.00
03/03/2023	18878(A)	MCGINNIS, PATRICK	REIMB EXPENSES - NOV, DEC, JAN	493.50
03/03/2023	18879(A)	MICHIGAN OFFICE ENVIRONMENTS	DESK ALTERATIONS	191.90
03/03/2023	18880(A)	MIDWEST ENERGY & COMMUNICATIONS	STREETLIGHT ENERGY COSTS	318.14
03/03/2023	18881(A)	MOLNAR, PATRICIA	REIMB-KHRMA MEMBERSHIP	120.00

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 2 of 8

Check Date	Check	Vendor Name	Description	Amount
03/03/2023	18882(A)	MUNICIPAL EMERGENCY SERVICES INC	FIRE SCBA REPAIR	475.00
03/03/2023	18883(A)	NASON, RICHARD	PER DIEM-MI FIRE INSPECTORS CONF	137.25
03/03/2023	18884(A)	NYE UNIFORMS	MISC UNIFORMS-FIRE & POLICE	6,122.89
03/03/2023	18885(A)	VOID		0.00
03/03/2023	18886(A)	VOID		0.00
03/03/2023	18887(A)	OFF THE CUFF CATERING	CATERING-VETERANS LUNCH, MOB COACH TR	1,819.00
03/03/2023	18888(A)	ONE WAY PRODUCTS	PARKS JANITORIAL SUPPLIES	1,653.68
03/03/2023	18889(A)	ONSTAFF USA INC	TEMPORARY EMPLOYEE SERVICES	18,626.44
03/03/2023	18890(A)	PHILLIPS, KIMBERLY	REIMB-FUNDRAISING SCHOOL EXPS, MO FEES	506.40
03/03/2023	18891(A)	PLASKO, PATRICIA MARIE	FITNESS INSTRUCTION JUST MOVE	180.00
03/03/2023	18892(A)	PORTAGE FIREFIGHTERS	IAFF UNION DUES FOR FEBRUARY 2023	1,980.00
03/03/2023	18893(A)	PORTAGE ON-CALL FIREFIGHTERS	ON-CALL FF UNION DUES FOR FEBRUARY 2023	20.00
03/03/2023	18894(A)	PORTAGE POLICE OFFICERS ASSOC	PPOA UNION DUES FOR FEBRUARY	672.00
03/03/2023	18895(A)	PRECISION PRINTER SERVICES INC	PRINTER SUPPORT SERVICE	1,089.86
03/03/2023	18896(A)	PREIN & NEWHOF	ENGINEERING SVCS-COOLEY DR & ROMENCE RD	12,948.90
03/03/2023	18897(A)	PRINTING SERVICES INC	PRINTING SERVICES	324.00
03/03/2023	18898(A)	RIDGE AUTO NAPA	EQUIPMENT REPAIR/MAINTENANCE SUPPLIES	1,697.23
03/03/2023	18899(A)	ROAD EQUIPMENT PARTS CENTER	MAINTENANCE SUPPLIES	31.96
03/03/2023	18900(A)	ROBERT LAMSON, LLC	POST-COE SCREENING	465.00
03/03/2023	18901(A)	ROE-COMM, INC.	MISC RADIO SERVICES	207.99
03/03/2023	18902(A)	SEVERANCE ELECTRIC COMPANY, INC	MISS DIG MARKINGS	880.00
03/03/2023	18903(A)	SPC SPECIALTY PRODUCTS, LLC	AQUAPHALT 6.0 DELIVERY	3,510.00
03/03/2023	18904(A)	STOUT, MELISSA JOY	FITNESS INSTRUCTION BARRE	440.00
03/03/2023	18905(A)	UNITED AUTO. IMPLEMENT WORKERS 2290	UAW UNION DUES FOR FEBRUARY 2023	566.50
03/03/2023	18906(A)	VANDERWIJER, JEFFREY P.	REIMB EXPS-MACP WINTER PROF DEV CONF	474.80
03/03/2023	18907(A)	WADE TRIM ASSOCIATES, INC.	ANNUAL ACTION PLAN & TECHNICAL ASSISTANCE	1,954.94
03/03/2023	18908(A)	WARNER NORCROSS & JUDD LLP	LEGAL SERVICES	2,564.50
03/03/2023	18909(A)	WAYNE COUNTY APPRAISAL LLC	ASSESSING SERVICES	37,835.83
03/03/2023	18910(A)	WEST MICHIGAN INT'L LLC	TRUCK REPAIRS	4,984.54
03/03/2023	18911(A)	WEST MICHIGAN STAMP & SEAL, INC	NAME PLATES	25.00
03/03/2023	18912(A)	WIGHTMAN	EGLD DAM RISK GRAND PRE-PROP, MDNR GRANT	1,945.00
03/03/2023	18913(A)	WOLVERINE POWER SYSTEMS	GENERATOR MAJOR INSPECTION	320.00
03/03/2023	18914(A)	XEROX CORPORATION	CARRY CHRG FOR EXPIRED LEASE	40.00
03/10/2023	18915(A)	BRENNER OIL CO.	BULK FUEL DELIVERY	20,884.80

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 3 of 8

Check Date	Check	Vendor Name	Description	Amount
03/10/2023	18916(A)	ELECTIONS OPERATING LLC	POSTAGE FOR ABSENT VOTER APPLICATIONS	2,688.00
03/10/2023	18917(A)	HARTFORD LIFE INSURANCE COMPANY	LIFE & LTD INSURANCE	10,485.66
03/10/2023	18918(A)	KLINE, MICHAEL	LAB SUPPLIES	81.37
Total ACH				234,899.04

Check Type: Paper

02/27/2023	323207	EMPLOYEE ISSUED	AP CHECK FOR REJECTED PAYROLL DIR DEPOSIT	2,734.91
02/28/2023	323208	CITY OF PORTAGE	2022 MIHAF PROGRAM PAYMENT	7,234.55
03/03/2023	323209	45TH CIRCUIT COURT	OUT OF COUNTY BOND	500.00
03/03/2023	323210	A-1 REFRIGERATION SALES & SERV	HVAC SERVICE CALL	595.00
03/03/2023	323211	ALLEGRA PRINT & IMAGING	PRINTING SERVICES	926.00
03/03/2023	323212	ASCENSION BORGESS HOSPITAL	POST-OFFER PHYSICAL	1,018.00
03/03/2023	323213	AT&T	ELECTRONIC COMMUNICATIONS	319.19
03/03/2023	323214	BEL-AIRE HEATING & AIR CONDITI	CDBG-REPL FURNACE & WATER HEATER	6,592.00
03/03/2023	323215	BENCHMARK PRODUCTIONS INC.	PROMO VIDEO SERVICE	150.00
03/03/2023	323216	BLOOM SLUGGETT, PC	LITIGATION-S WESTNEDGE AVE STORM SEWER	287.50
03/03/2023	323217	BOTT, BARB	REIMBURSE COST OF MUSIC	181.12
03/03/2023	323218	BRANCH, CHERI	TRIP REFUND SHOP HOP 230314	150.00
03/03/2023	323219	CALIBER HOLDINGS LLC	INTERCEPTOR VEHICLE REPAIRS	794.74
03/03/2023	323220	CAPITOL STRATEGIES, LLC	CONSULTING FOR FEBRUARY 2023	6,000.00
03/03/2023	323221	CATHOLIC FAMILY SERVICES	FY 22-23 HUMAN SERVICES BOARD	8,500.00
03/03/2023	323222	CHICAGO TITLE OF MICHIGAN, INC.	CDBG TITLE SEARCH	150.00
03/03/2023	323223	CINTAS CORPORATION NO. 2	UNIFORM RENTAL FOR INSPECTORS	4.89
03/03/2023	323224	CITY OF KALAMAZOO TREASURER	BIO DIESEL FUEL	1,601.96
03/03/2023	323225	DALE W. HUBBARD, INC.	SEWAGE EJECTOR PUMP REPAIR	1,372.08
03/03/2023	323226	DIGITAL IMPACT DESIGN, INC.	TRASH CAN LABELS	518.60
03/03/2023	323227	DISABILITY NETWORK SOUTHWEST MICH	FY 22-23 HUMAN SERVICES BOARD	6,000.00
03/03/2023	323228	DOW, ELIZABETH	TRIP REFUND SHOP HOP 230314	70.00
03/03/2023	323229	ED DRESLINSKI CONSULTING INC	FIELD TRAINING OFFICER UPDATE REGISTRATION	275.00
03/03/2023	323230	EMERGENCY VEHICLE PRODUCTS	EQUIPMENT REPAIR/MAINTENANCE	1,736.71
03/03/2023	323231	FADER EQUIPMENT, INC.	REPAIR/MAINTENANCE SUPPLIES	25.20
03/03/2023	323232	FIRE DEPARTMENT TRAINING NETWORK	FDTN FIRE MEMBERSHIPS	300.00
03/03/2023	323233	FIRST REFORMED CHURCH	PARKING LOT USE	300.00
03/03/2023	323234	FRENCH, STACY	PER DIEM - MI FIRE INSPECTORS CONF	137.25

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 4 of 8

Check Date	Check	Vendor Name	Description	Amount
03/03/2023	323235	GIPSON, GAYDENE	TRIP REFUND SHOP HOP 230314	65.00
03/03/2023	323236	GORDON FOOD SERVICE	COFFEE BAR & KITCHEN SUPPLIES - PZSC	1,081.12
03/03/2023	323237	GRAHAM, WILLIAM	PER DIEM - MI FIRE INSPECTORS CONF	137.25
03/03/2023	323238	GREATER KALAMAZOO FOP LODGE 98	FOP PORTION OF PPOA UNION DUES FOR FEB	3,240.28
03/03/2023	323239	GREEN, JANET	TRIP REFUND 290930 LAKE PLACID	50.00
03/03/2023	323240	GROVE, PATRICIA	TRIP REFUND SHOP HOP 230314	70.00
03/03/2023	323241	HOME DEPOT	REPAIR/MAINTENANCE SUPPLIES	562.51
03/03/2023	323242	VOID		0.00
03/03/2023	323243	HOUSEAL LAVIGNE ASSOCIATES, LLC	PROFESSIONAL SERVICES - MASTER PLAN	23,815.27
03/03/2023	323244	HOUSING RESOURCES, INC.	FY 22-23 HUMAN SERVICES BOARD	12,500.00
03/03/2023	323245	HUDSON, MARGARET & SOFI	TRIP REFUND COMEDY OF ERRORS 230329	280.00
03/03/2023	323246	IAFC	COMM RISK REDUCTION LDRSHF CONF-REG	425.00
03/03/2023	323247	ICMA MEMBERSHIP RENEWALS	2023 MEMBERSHIP DUES	1,200.00
03/03/2023	323248	INDIANA UNIVERSITY	FUND RAISING CLASSES	1,295.00
03/03/2023	323249	INFOGUYS, INC.	MIRS ANNUAL SUBSCRIPTION	1,060.00
03/03/2023	323250	INT'L INSTITUTE MUNI. CLERKS	ADD'L MEMBERSHIP FEE OWED	10.00
03/03/2023	323251	J & B MEDICAL SUPPLY	FIRE TRAINING SUPPLIES	2,825.00
03/03/2023	323252	JAMES, FE	IDEAWORX: COTTAGE FOOD LAW REFUND	40.00
03/03/2023	323253	JASSIM, DANIEL	RENTAL DAMAGE DEPOSIT REFUND	150.00
03/03/2023	323254	JOHNSON, JUDY	TRIP REFUND 230314 SHOP HOP DAY	80.00
03/03/2023	323255	KALAMAZOO ABRAHAM LINCOLN INST	RENTAL DEPOSIT REFUND	150.00
03/03/2023	323256	KALAMAZOO COUNTY TREASURER	2022 KAL CO LEXINGTON DRAIN & AUSTIN LK DISB	53,231.53
03/03/2023	323257	KALAMAZOO EXCAVATION AND SEPTIC, LL	BD PAYMENT REFUND	55.00
03/03/2023	323258	KALAMAZOO FLAG COMPANY, LLC	FLAGS	447.00
03/03/2023	323259	KALAMAZOO LANDSCAPE SUPPLIES	RESTORATION SUPPLIES FOR CEMETERIES	925.00
03/03/2023	323260	KALAMAZOO LITERACY COUNCIL	FY 22-23 HUMAN SERVICES BOARD	1,375.00
03/03/2023	323261	KALAMAZOO PICKLEBALL	PICKLEBALL CLINICS	170.00
03/03/2023	323262	KALAMAZOO YOUTH FOR CHRIST	FY 22-23 HUMAN SERVICES BOARD	3,750.00
03/03/2023	323263	KLOK, BRIAN	PER DIEM - MI FIRE INSPECTORS CONF	137.25
03/03/2023	323264	KONICA MINOLTA BUSINESS SOLUTIONS	COPIER CONTRACT - COMMUNICATION SVCS	364.00
03/03/2023	323265	KZOO TIRE COMPANY	VEHICLE REPAIR/MAINTENANCE	881.80
03/03/2023	323266	LASATER, LAUREN	ART IN THE PARK WINEGLASS PAINTING	288.00
03/03/2023	323267	LAWLER, FAY	SHOP HOP DAY TRIP REFUND	70.00
03/03/2023	323268	LEATHERMAN, ROB	PER DIEM - SMEMSIC SPRING CONF	164.00

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 5 of 8

Check Date	Check	Vendor Name	Description	Amount
03/03/2023	323269	LENS EQUIPMENT LLC	TACTI TRACK 15 GPS W/CELL SERVICE	1,218.00
03/03/2023	323270	LEXISNEXIS RISK DATA MANAGEMENT INC	DORS REPORTING LIC/SUPPORT FEES	3,255.00
03/03/2023	323271	LINDBERG, ERIK	GRAIN ELEVATOR DEPOSIT REFUND	150.00
03/03/2023	323272	MASTIN, EUNICE	TRIP REFUND 230314 SHOP HOP DAY	65.00
03/03/2023	323273	MCALLISTER, BARBARA	TRIP REFUND 230314 SHOP HOP DAY	80.00
03/03/2023	323274	MCDONALD'S TOWING & RESCUE, INC.	TOWING SERVICES	138.00
03/03/2023	323275	MCDONALD, LINDA	TRIP REFUND 230314 SHOP HOP DAY	70.00
03/03/2023	323276	MCKIM, DEBBIE	STUART MANOR RENTAL REFUND	200.00
03/03/2023	323277	MICH MUNICIPAL POLICE & FIRE REPAIR	POLICE VEHICLE REPAIR & MAINT	1,940.97
03/03/2023	323278	MICHIGAN URBAN SEARCH AND RESCUE	CONFINED SPACE & ROPE RESCUE TRAINING	11,792.22
03/03/2023	323279	MILLER, CANFIELD, PADDOCK & STONE	AUSTIN LAKE TRAIL LEGAL SERVICES	1,467.50
03/03/2023	323280	MONUMENT ENGINEERING GROUP ASSOCIAT	ACT 51 SURVEY & DIAGRAM	465.00
03/03/2023	323281	MOORLAG, JOSIE LIN	PAYMENT FOR YOGA 4 LIFE INSTRUCTION	1,140.00
03/03/2023	323282	NOTT, SARAH	WATERCOLOR CLASS INSTRUCTION	125.00
03/03/2023	323283	OFFICE DEPOT, INC.	OFFICE SUPPLIES	1,116.83
03/03/2023	323284	VOID		0.00
03/03/2023	323285	PETTY CASH-JANET GATES	REPLENISHMENT CHECK	309.74
03/03/2023	323286	POLEY, PATRICIA	TRAVEL REFUND 230611 LAKES GRAPES	100.00
03/03/2023	323287	R S TECHNICAL SERVICES, INC.	ELECTROMAGNETIC FLOW METERS-GARDEN LN	15,655.93
03/03/2023	323288	RANDALL, PATRICIA	EXPENSE REIMB-MME PRESENTER	124.68
03/03/2023	323289	RATHCO SAFETY SUPPLY, INC.	TRAFFIC SIGNS AND MAINTENANCE	55.00
03/03/2023	323290	REED, CALYSTA	LAKEVIEW SOFTBALL DEPOSIT REFUND	100.00
03/03/2023	323291	RENTALEX OF MICHIGAN, INC.	RENTAL CHAIRS, PLATFORM	750.00
03/03/2023	323292	RICHAR, NICOLE	GRAIN ELEVATOR DEPOSIT REFUND	150.00
03/03/2023	323293	ROAD WARRIORS INC	AERIAL LIFT TRAINING/RECERTIFICATIONS	2,005.00
03/03/2023	323294	ROWERDINK, INC.	MAINTENANCE SUPPLIES	329.61
03/03/2023	323295	ROWLEY BROTHERS, INC.	OIL DRY FOR SHOP & STREETS	2,006.20
03/03/2023	323296	SIMMONS, APRIL	TRIP REFUND SHOP HOP DAY 230314	80.00
03/03/2023	323297	SINON, STEPHANIE	SCHOOLHOUSE DEPOSIT REFUND	50.00
03/03/2023	323298	SMEMSIC	REGISTRATIONS FOR SPRING CONF	785.00
03/03/2023	323299	STALKER RADAR	RADAR REPAIR	107.50
03/03/2023	323300	STATE OF MICHIGAN (DOT)	LOVERS LN RECONST CONTRACT, TRAF SIGN REPL	72,774.78
03/03/2023	323301	STATE OF MICHIGAN (EGLE)	WATER USE REPORTING FEE- MPIR	200.00
03/03/2023	323302	STEENSMA LAWN & POWER EQUIPMENT	SMALL EQUIPMENT REPAIR/MAINTENANCE	2,022.91

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 6 of 8

Check Date	Check	Vendor Name	Description	Amount
03/03/2023	323303	SWART, SARAH	TRIP REFUND 290930 LAKE PLACID VERMONT	50.00
03/03/2023	323304	T-MOBILE USA INC	MISC CELL PHONE CHARGES	624.21
03/03/2023	323305	T-SHIRT PRINTING PLUS, INC.	HEAVY PULLOVERS/UNIFORMS INSPECTORS	498.00
03/03/2023	323306	TAYLOR, ROBERTA	TRIP REFUND 230416 SAVANNAH	50.00
03/03/2023	323307	TELUS COMMUNICATIONS (U.S.) INC	SKYHAWK GPS ACCESS/SERVICE FEES	755.20
03/03/2023	323308	THORSON, JOYCE	TRIP REFUND 230416 SAVANNAH	50.00
03/03/2023	323309	TWELVE BASKETS FOOD PANTRY	FY 22-23 HUMAN SERVICES BOARD	9,959.00
03/03/2023	323310	UNITED KENNEL CLUB	OVERPAYMENT ON PARCEL	1,752.55
03/03/2023	323311	UNITED PARCEL SERVICE	UPS WEEKLY	28.56
03/03/2023	323312	US HYD LLC	BELLY BLADE CYLINDER REBUILD	767.77
03/03/2023	323313	VANECEK, BARBARA	TRIP REFUND 230314 SHOP HOP	70.00
03/03/2023	323314	VANECEK, SUSAN	TRIP REFUND 230314 SHOP HOP	70.00
03/03/2023	323315	VANFLEET, CAMERON	GRAIN ELEVATOR DEPOSIT REFUND	150.00
03/03/2023	323316	VANGUARD FIRE & SUPPLY CO., INC.	FIRE SCBA MAINT	495.00
03/03/2023	323317	VARIPHY INC.	VARIPHY RENEWAL	2,250.00
03/03/2023	323318	VICKSBURG HARDWARE	STRING TRIMMER REPAIRS/MAINTENANCE	758.70
03/03/2023	323319	WHITMER, MARY LOU	TRIP REFUND 230314 SHOP HOP	70.00
03/03/2023	323320	WILD, JED	PER DIEM - SMEMSIC SPRING CONF	164.00
03/03/2023	323321	WOLZ, MARI-CLARE	SCHOOLHOUSE DEPOSIT REFUND	50.00
03/03/2023	323322	XAVUS SOLUTIONS	ANNUAL UPGRADES MAINT & SUPPORT	1,850.00
03/03/2023	323323	YWCA INC	FY 22-23 HUMANS SERVICES BOARD	10,000.00
03/10/2023	323324	HEALTHSOURCE SOLUTIONS, LLC	22-23 PEEP PLATFORM	1,895.46
03/10/2023	323325	KALAMAZOO COUNTY TREASURER	2023 DOG LICENSE SALES PAYMENT	3,282.00
03/10/2023	323326	PETTY CASH-AMANDA JANSSEN	REPLENISHMENT CHECK	413.14

Total Paper Checks

316,253.17

Check Type: Auto-Pay Payments

03/01/2023	MISSIONSQUARE	EMPLOYER RETIREMENT CONTRIBUTIONS	16,217.43
03/02/2023	CONSUMERS AUTO-PAY	GAS-ELECTRIC	411.42
03/03/2023	CARD CONNECT	PROCESSING FEES	1,062.05
03/06/2023	BLUE CROSS/BLUE SHIELD OF MICH	HEALTH INSURANCE	455.76
03/07/2023	INVOICE CLOUD	PROCESSING FEES	636.25
03/10/2023	MISSIONSQUARE	EMPLOYEE RETIREMENT WITHHOLDINGS	42,599.80

Total Auto-Pay Payments

61,382.71

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 7 of 8

Check Date	Check	Vendor Name	Description	Amount
Check Type: Electronic Payments				
02/28/2023		HUNTINGTON NATIONAL BANK	DEBT SERVICE PAYMENTS	35,775.00
03/01/2023		SBF	POSTAGE - WATER/SEWER BILLS	2,319.32
03/03/2023		HUNTINGTON NATIONAL BANK	DEBT SERVICE PAYMENTS	500.00
03/07/2023		ASU GROUP	WORKERS COMP FUNDING	19,032.45
03/10/2023		MULTIPLE	WEEKLY TAX DISBURSEMENT 2/28/23	1,235,258.62
03/10/2023		MULTIPLE	WEEKLY TAX DISBURSEMENT 2/28/23	237,865.06
03/10/2023		HUNTINGTON NATIONAL BANK	DEBT SERVICE PAYMENTS	500.00
Total Electronic Payments				1,531,250.45
Check Type: Credit Card				
01/31/2023		GOVERNMENT FINANCE OFFICE	PAFR APPLICATION	250.00
01/31/2023		ADOBE STOCK	STOCK PHOTO/VIDEO/MUSIC LIBRARY-PUB INFO OFC	19.99
01/31/2023		AMERICAN PLANNING A	COM DEV CONFERENCE REGISTRATION	866.00
02/01/2023		INF GOODHIRE.COM	OUT OF STATE BACKGROUND CHECK	59.99
02/01/2023		AMERICAN AIR0012368241377	COM DEV CONFERENCE FLIGHT	786.80
02/02/2023		WWW.FPA.ORG	SENIOR CENTER CLASS SUPPLIES	906.62
02/01/2023		SOARING EAGLE HOTEL	COM DEV BUILDING INSPECTOR CONF HOTEL	172.33
02/02/2023		IAEI	ELECTRICAL INSPECTOR ANNUAL MEMBERSHIP	120.00
02/03/2023		AMANDA YAS (1 OF 1 PA	HEADSHOTS	750.00
02/05/2023		HAMPTON INNS	PARKS EVENT PERFORMERS HOTEL	267.18
02/07/2023		USA ARCHERY	SPORTS COORDINATOR ANNUAL MEMBERSHIP	70.00
02/07/2023		THE WEBSTAUANT STORE INC	SENIOR CENTER KITCHEN SUPPLIES	402.62
02/07/2023		HAMPTON INN SUITES	POLICE TRAINING HOTEL STAY	284.24
02/08/2023		SP KALAMAZOO CANDLE	SENIOR CENTER CANDLE MAKING CLASS	500.00
02/08/2023		AMWAY GRAND PLAZA HOTE	POLICE CONFERENCE HOTEL STAY	809.60
02/08/2023		APT US&C	ASSISTANT TREASURER ANNUAL MEMBERSHIP	200.00
02/10/2023		FSP KALAMAZOO HUMAN RESOU	HUMAN RESOURCES CONFERENCE REGISTRATION	358.00
02/10/2023		EB CERTIFIED SCRUMMAS	HUMAN RESOURCES TRAINING REGISTRATION	928.26
02/10/2023		NCAA MUSEUM FLEX	SENIOR CENTER TRAINING MEAL	59.80
02/10/2023		AMWAY GRAND PLAZA HOTE	POLICE CONFERENCE HOTEL STAY	575.52
02/10/2023		AMWAY GRAND PLAZA HOTE	HOTEL TAX REFUND	(42.24)
02/13/2023		COURTYARD INDIANAPOLIS	SENIOR CENTER TRAINING HOTEL CHARGE	195.00
02/07/2023		HAMPTON INNS	HOTEL TAX REFUND	(29.18)

ACCOUNTS PAYABLE REGISTER
Check Dates From: 2/26/2023 to 3/11/2023

Page 8 of 8

Check Date	Check	Vendor Name	Description	Amount
02/13/2023		NATIONAL LEAGUE OF	CMO CONFERENCE REGISTRATION	2,060.00
02/14/2023		LEAGUE OF AMERICAN WHEEL	PARKS DEPARTMENT BIKE INSTRUCTOR TRAINING	500.00
02/14/2023		FOOD AT BIGAPPLEBAGELS	ANNUAL FARMERS MARKET MEETING	151.98
02/14/2023		ADOBE CREATIVE CLOUD	PUBLIC INFORMATION SOFTWARE ANNUAL RENEWAL	635.87
02/15/2023		IFEBP MILWAUKEE	HUMAN RESOURCES ANNUAL MEMBERSHIP	325.00
02/16/2023		MGFOA REGISTRATION FEE	FINANCE DEPARTMENT SEMINAR REGISTRATION	119.00
02/17/2023		FRADULENT CHARGES	UNAUTHORIZED CHARGE REFUND	(1,318.43)
02/16/2023		STATE OF MI MIDEAL	PURCHASING ANNUAL MEMBERSHIP	230.00
02/12/2023		JW MARRIOTT INDY	SENIOR CENTER TRAINING HOTEL STAY	912.60
02/20/2023		FSP KALAMAZOO HUMAN RESOU	HUMAN RESOURCES CONFERENCE REGISTRATION	179.00
02/20/2023		MGFOA REGISTRATION FEE	FINANCE DEPARTMENT SEMINAR REGISTRATION	125.00
02/20/2023		FREE CONFERENCE CALL GLOB	TECH SERVICES CONFERENCE CALL USAGE	3.13
02/25/2023		ASSOC FOR TALENT DEV	HUMAN RESOURCES ANNUAL MEMBERSHIP	279.00
02/23/2023		WOLVERINE POWER SYSTEMS	WINTER STORM GENERATOR RENTAL	1,715.00
02/24/2023		HRCI.ORG	HUMAN RESOURCES RECERTIFICATION	381.65
02/24/2023		IN OFF THE CUFF CATERING	SENIOR CENTER FEBRUARY LUNCHEON	1,399.50
02/25/2023		LEAGUE OF AMERICAN WHEEL	PARKS ANNUAL MEMBERSHIP	50.00
02/24/2023		SKILLPATH / NATIONAL	HUMAN RESOURCES TRAINING REGISTRATION	199.00
			Total Credit Card Payment	16,457.83
			Grand Total	2,160,243.20

TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: Block Party Ordinance

SUPPORTING PERSONNEL: Erica Eklov, City Clerk

ACTION RECOMMENDED: Accept for first reading an amendment to Chapter 66 of the Code of Ordinances (Streets, Sidewalks, & Other Public Places) include Sec. 66-7. "Block Parties," with final reading to occur April 4, 2023.

In an effort to match other cities in Michigan and have a true ordinance to support the City of Portage's allowance of Block Parties, the Office of the City Clerk has drafted the attached ordinance. It is a hybrid of several existing jurisdiction's ordinances, including the cities of Battle Creek, Ann Arbor, Dearborn, East Lansing, and Kalamazoo, in addition to established administrative processes in Portage. Currently, the City of Portage allows Block Parties by way of an application to the City Clerk's Office but does not have any formal language, administrative reviews, or enforcement steps, aside from a combined enforcement of the existing city Noise and Disorderly Conduct ordinances.

The draft ordinance has been reviewed and approved by the Public Safety Director, Fire Marshal, and Transportation Engineer. Following the initial review, the Transportation Engineer requested edits to the definition of a block party to ensure the participation of non-residents was limited, noting a problem in other cities with overly large and excessive parties, especially related to Airbnb rented properties. The Fire Marshal has no issue with block parties unless large tents or other structures are used that fall under review of the building and/or fire code, which would then require a special use permit.

The addition of the adjacent resident petition was implemented to mirror the previously mentioned cities, as well as address citizen access concerns that arose following several block parties in the pandemic period of COVID-19. There is no desire to limit the opportunity for block parties in the City of Portage, nor require fees, simply establish a framework for the public gathering option for public streets and sidewalks. It is also intended that there be no charge for the application at this time, as is current practice.

As such, it is recommended that City Council accept for first reading an amendment to Chapter 66 of the Code of Ordinances (Streets, Sidewalks, & Other Public Places) to include Sec. 66-7. "Block Parties," with final reading to occur April 4, 2023.

FUNDING: Not Applicable

Attachments: 1. New Ordinance Draft

**AN ORDINANCE TO AMEND THE CODE OF ORDINANCES
OF THE CITY OF PORTAGE, MICHIGAN BY AMENDING CHAPTER 66,
STREETS, SIDEWALKS AND OTHER PUBLIC PLACES**

THE CITY OF PORTAGE ORDAINS:

That Chapter 66 shall be amended as follows:

ARTICLE 1. - IN GENERAL

Sec. 66-7. - BLOCK PARTIES

(a) Definitions.

The following words, phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

“Block party” shall mean a gathering of Block Party Attendees on a public street or right of way within a neighborhood, not to exceed two (2) blocks, to include barricades at no charge, for a single day.

“Block Party Attendees” shall mean an organized group of residents who live in or directly adjacent to a specified area or neighborhood.

“Applicant” shall mean or refer to a designated resident within the specified Block Party area of the neighborhood who shall be held responsible for the activities within that area for the duration of the Block Party including setup and take-down of the barricades, cleanup of the public rights-of-way, and maintaining a clear lane for emergency vehicles.

(b) Permit required.

It shall be unlawful to organize or participate in any Block Party in the city unless a permit has first been obtained from the city clerk’s office. In addition to all other state and local laws, all Block Party Attendees shall abide by the following provisions of the City of Portage Code of Ordinances:

- (1) Chapter 24, Article 4 “Noise”;
- (2) Chapter 50, Article 4 “Offenses Against Public Peace & Order”; and
- (3) If alcoholic beverages are served, comply with associated local and state laws.

(c) Application for permit.

An application for a permit for any Block Party regulated under this article shall be made to the city clerk's office, at least thirty (30) days prior to the event, on a form provided therefor. The application shall contain the following information:

- (1) Name, address, and telephone number of the Applicant organizing such party.
- (2) Location of the Block Party, including those streets to be barricaded and the cross streets involved.
- (3) Date and times for the Block Party and alternate date in the event of inclement weather.
- (4) A petition signed by at least 51 percent of the property occupants with driveways on the streets requested to be closed for the Block Party. A form for the petition must be obtained from the city clerk's office.
- (5) Copy of the Applicant's homeowner's insurance policy as evidence of coverage.

A completed application shall be received by the office of the city clerk and reviewed by the city clerk, traffic engineer, department of public works, and department of public safety or any such designee for the noted positions.

(d) Permit fees.

The permit fee, as approved by City Council via annual resolution, must be paid before the permit is issued. One Block Party per block per year is permitted at no charge; additional closures will be reviewed and require a \$75 application fee plus \$100 cost for use of barricades.

(e) Barricades.

- (1) Barricades from the department of public works may be utilized to secure streets.
- (2) Barricades are available upon request by the Applicant. The Applicant is responsible for contacting the department of public works as soon as possible to reserve barricades. The Applicant is responsible for barricade pick up and drop off.
- (3) Barricades must be returned to the department of public works within five (5) calendar days of the date of issuance. Failure to do so will result in a replacement cost charge to the Applicant for each missing barricade. Failure to pay any invoice generated to cover the cost of missing or damaged barricades within 30 days will accrue interest at the established city rates.

(f) Access to streets.

- (1) Only local streets, as shown on the City's Street Index map, are permitted to be closed for a Block Party. Arterial streets, collector streets, and the first block of local streets that intersect the major streets are not permitted to be closed.

(2) Street access shall not be blocked by motor vehicles, picnic tables, tents/canopies, trash receptacles, etc.

(3) Street access must remain available for emergency equipment at all times.

(4) Non-participating residents must be allowed access to their property at all times.

(5) No streets may be closed for a Block Party earlier than 9 a.m. on the day of the party.

(6) All streets must be cleared and re-opened for traffic no later than 11:00 p.m. on the day of the Block Party.

(e) Revocation of permit.

The chief of police or his designee shall have the authority to revoke a Block Party permit if it is deemed to be in the best interest of the residents of the city.

Secs. 66-8 — 66-30. - Reserved.

TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: Rezoning Application No. 22/23-8 - 7438 Lovers Lane

SUPPORTING PERSONNEL: Jonathon Hallberg, Interim Director of Community Development

ACTION RECOMMENDED: Receive Rezoning Application No. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex developments, and set a public hearing for April 18, 2023.

OVERVIEW

Green Development Ventures, LLC submitted Rezoning Application No. 22/23-8 to rezone the 2.16-acre site at 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex housing development. The site is located near the center of Portage along the west side of Lovers Lane, north of Garden Lane.

The applicant has submitted the project narrative describing the city's Comprehensive Plan, neighboring conditions and compatibility, and environmental/utility items, and a letter from the previous property owner (Howard Kerney) giving permission to the applicant to file the subject rezoning application. The current property owner, Swan Bravo Opportunity Zone Business, purchased the property on February 10, 2023. The applicant, Green Development Ventures, LLC and the current property owner are under the Allen Edwin Homes. If the rezoning application is approved, it is expected that the applicant will purchase the property and submit permits for future duplexes.

Existing Conditions

Existing Land Use/ Zoning	• The subject site is undeveloped, consists of a variety of natural vegetation, and is currently zoned R-1B One-Family Residential. • <u>North</u>: Single Family Home; 7426 Lovers Ln.; Zoned: R-1B One-Family Residential. • <u>South</u>: Vacant; Consumer's Energy Overhead Powerline; Zoned: R-1B One-Family Residential. • <u>East</u>: Vacant Land, 7029 Lovers Ln, Zoned R-1B One-Family Residential; and 7511 Lovers Ln, Vacant, Zoned I-2 Heavy Industrial. • <u>West</u>: City of Portage Water Treatment System; 7451 Garden Ln.; Zoned R-1B One-Family Residential.
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Public Streets	2019 Lovers Lane (just south of Garden Lane intersection) recorded 8,064 AADT total trip counts. (AADT - Annual Average Daily Trips) Recorded by Kalamazoo Area Transportation Study (KAT S).
Public Utilities	City sanitary sewer and water are available.
Environment	The site contains various natural vegetation, trees, bushes, and grasses.
Unique Conditions	There are no mapped wetlands, flood hazards, or mapped or identified historic structures/ buildings on the site.

ANALYSIS

Applicable Zoning Regulations

The following sections of Chapter 42. Division 8. Subsection 651 *Amendments to this Article*. procedures and regulations apply and are addressed further in this report:

- [Sec. 42-651. Amendments to this Article](#)

Under this article, the applicant for rezoning request shall file a rezoning application, fee, and schedule for review during public hearings at the Planning Commission and City Council. The Planning Commission shall determine if the rezoning is appropriate based on the Comprehensive Plan, surrounding development patterns, and based upon general land use considerations. Issues to be analyzed include consistency with the Future Land Use Map, suitability of the existing zoning classification, and the impact of the proposed zoning classification.

Existing Zoning: R-1B One-Family Residential District

Under the current R-1B One-Family District, the allowed uses are limited to single family homes, day cares, adult foster care family homes, and agricultural uses. Duplex residences (2 units attached) are not allowed.

Comprehensive Plan

The Future Land Use Map component of the [Comprehensive Plan](#) designates the majority of the property as ‘Medium Density Residential’, while a small portion in the southeast corner (near the overhead power lines and Lovers Lane) is designated as ‘Park/ Recreation’. The adjacent properties to the north (existing single-family dwellings) are designated ‘Medium Density Residential’. The abutting land to the west owned by Consumer’s Energy and City of Portage are designed as ‘Park/ Recreation’. The ‘Park/ Recreation’ designation is classified as its name implies, general park and recreational purposes. The ‘Medium Density Residential’ designation is classified as areas for quality, medium-density residential development such as duplexes, attached condominiums, townhomes, apartment buildings, etc. at densities of 4 – 8 units per acre, and corresponds to the following zoning districts: R-1T, RM-2 and PD zoning districts. Therefore, the proposed R-1T district is consistent with the ‘Medium Density Residential’ designation.

This proposed rezoning aligns with and will help achieve the Portage City Council’s goal of “attracting residential development that provides a mixture of housing for all income levels” as shown in the Fiscal Year 2022-2023 City of Portage Budget under the Strategic Priorities “Neighborhood” category.

Suitability of R-1T Attached Residential/ Neighborhood Harmony

The proposed rezoning to [R-1T Attached Residential District](#) allows many uses similar to R-1B plus single-family attached homes, community recreational centers, day care centers/ group child care homes, and other land uses. This district provides a transition from low to medium/ higher residential densities and commercial districts. Existing R-1T districts are found abutting lower density One-Family Residential districts throughout the city and are developed with duplexes and attached one-family housing in 2-4 attached unit buildings. The site is suitable for future development because it is connected to City water and sewer, has 348 feet of frontage along Lovers Lane, and has relatively minor grade changes. The site's unique hour-glass shape provides two areas to accommodate future buildings and parking areas.

R-1T Attached Residential District - Additional Development Requirements

Attached housing developments in the R-1T district shall be further reviewed through Site Plan application review to meet the following additional development standards [per Sec. 42-202. - Conditions and requirements for one-family attached dwellings](#):

1. A minimum of 6,000 square feet of lot area per attached dwelling unit shall be required. The area for computing density shall be the total site area exclusive of any dedicated right-of-way of either interior or boundary roads.
2. Unless the planning commission approves a different ratio, the lot width to depth ratio shall be not greater than two-to-one as measured at the right-of-way line.
3. In a platted or site condominium one-family attached development, each building shall be erected on a separate lot of at least 6,000 square feet per dwelling unit and have a minimum lot width of 40 feet.
4. Dwelling units may be attached to each other by one or more of the following methods:
 - a. A common party wall which does not have over 80 percent of its area in common with an abutting dwelling wall;
 - b. By means of an architectural wall detail which does not form interior room space; or
 - c. Through a common party wall in only the garage portion of an abutting structure.
5. No side yard setbacks shall be required for units that are attached by a common party wall or an architectural wall detail.
6. Not more than four units shall be connected, and all units shall have independent first floor entryways.
7. The maximum horizontal dimension across any elevation of an accessory building shall be 40 feet.
8. At least a one-car garage, enclosed on all sides, shall be provided for each dwelling unit.
9. A landscaping plan to buffer the development from abutting land uses shall be submitted by the developer, with emphasis on natural buffering as opposed to walls and fences.
10. The development shall have at least one property line abutting a major or collector thoroughfare, as defined in the major thoroughfare plan.
11. There shall be no access to or from a one-family attached dwelling development through property zoned for other one-family residential use.
12. The development shall be served by public water supply and public sanitary sewer collection systems.
13. Principal or accessory uses which are primarily designed to benefit residents of attached dwellings shall be located entirely in an R-1T district.

Comparison of Existing R-1B One-Family with Proposed R-1T Attached Residential

Based on the above chart and previous paragraph, the R-1T district has similar yard setbacks but allows a higher density and more building lot coverage than the R-1B. However, R-1T must conform to specific site design requirements.

The applicant has not submitted any designs for future duplexes, nor is it required in the rezoning application. Further, the rezoning application does not pre-approve any development project. If the rezoning is approved, the applicant may submit development plans for any permitted use within the R-1T district, some of which may require Planning Commission approval while others can be administratively approved.

PUBLIC HEARING

A public hearing for this rezoning application was opened at the March 2, 2023 Planning Commission meeting. During the meeting, the Commission discussed the proposed rezoning. The applicant, Mike West, Green Development Ventures, LLC, was present to discuss the rezoning and future use of the site, and stated that he believes the proposal is compatible with the City's Comprehensive Plan. Three members of the public provided testimony and expressed opposition to the project due to perceived concerns about the size of the lot to accommodate future housing, the impacts on traffic, property value, and wildlife. The Planning Commission determined no further discussion was needed and voted to close the public hearing.

After careful consideration, the Planning Commission voted unanimously (8-0) to recommend to City Council the approval of rezoning application No. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex development.

RECOMMENDATION

It is therefore recommended that City Council receive the rezoning application No. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential to expand residential development opportunities, and set up a public hearing for April 18, 2023.

FUNDING: Not Applicable

- Attachments:**
1. Rezoning Application and Project Narrative
 2. Vicinity Map
 3. Existing Zoning map
 4. Comp. Plan - Future Land Use Map
 5. Staff's Site Pictures
 6. 1st Reading
 7. Planning Commission Transmittal Letter 031623
 8. Planning Commission Meeting minutes 030223

Green Development Ventures, LLC
2186 East Centre Avenue
Portage, Michigan 49002

January 31, 2023

Eric Feldt, City Planner/Project Manager
Department of Community Development
City of Portage
7900 South Westnedge Avenue
Portage, Michigan 49024

Re: Rezoning Application, 7438 Lovers Lane (R-1B to R-1T)

Dear Eric,

Attached please find the Rezoning Application package for 7438 Lovers Lane (Parcel #10-08340-025-A). The application proposes to rezone this 2.16 acre property from R-1B, One Family Residential to R-1T, Attached Residential. The application packet includes the following documents:

- Application for Zoning Amendment and \$1,419 Review Fee
- Letter of Authorization from Current Owner
- Rezoning Summary Analysis
- Portage GIS Parcel Report – 7438 Lovers Lane

If practical, it is requested that this rezoning application be scheduled for the March 2, 2023 Planning Commission meeting.

If you have any questions or require additional information, please contact me at your earliest convenience.

Sincerely,



Michael West, AICP
Land Planning Project Manager
Green Development Ventures, LLC
2186 East Centre Avenue
Portage, Michigan 49002
(269) 365-8548
mwest@allenedwin.com

APPLICATION FOR ZONING AMENDMENT

Application number _____

Date January 31, 2023

APPLICATION INFORMATION:

Meetings of the Portage Planning Commission are held on the first and third Thursday of each month at 7:00 p.m. in the Council Chambers of Portage City Hall, 7900 South Westnedge Avenue, Portage, Michigan. All zoning amendment applications must be properly filled out and submitted to the Department of Community Development and the zoning amendment fee paid at least 15 working days prior to the meeting at which the public hearing is held. The applicant will be notified in writing of all such public hearing/meetings. *Please note: City Staff and/or Planning Commissioners may visit the subject property while the application is under review.*

For more detailed information about the zoning amendment process, please refer to Portage Land Development Regulations, Article 4, Division 8, Subdivision 2.

TO THE PLANNING COMMISSION:

I (WE), the undersigned, do hereby respectfully make application and petition the Portage Planning Commission to amend the Zoning Ordinance and/or change the Zoning Map as hereinafter requested. In support of this application, the following is submitted:

ZONING MAP AMENDMENT

1. a. Platted Land:

The property is part of the recorded plat: The property sought to be rezoned is located at _____ between _____ Street and _____ Street on the _____ side of the street, and is known as Lot Number(s) _____ of _____ Plat (Subdivision). It has a frontage of _____ feet and a depth of _____ feet.

b. Unplatted Land:

The property is in acreage, and is not therefore a part of a recorded plat. The property sought to be rezoned is located and described as follows: (Indicate total acreage and parcel number).
7438 Lovers Lane (Parcel #10-08340-025-A), 2.16 acres

2. a. Do you own the property to be rezoned? Yes ☐ No ☒

b. Name of the owner of the property to be rezoned: Howard Kerney

Address 3904 Greenleaf Circle, Kalamazoo, MI 49008

* see letter of authorization (attached)

3. My (our) interest in the property and purpose for submitting the proposed Zoning Amendment:
* prospective purchaser (Green Development Ventures LLC,
2186 East Centre Avenue, Portage, MI 49002)

4. CURRENT ZONING: R-1B PROPOSED ZONING: R-1T

ZONING TEXT AMENDMENT

1. The proposed language to be considered is (attach additional sheets as necessary):

2. The Zoning Code Chapter and Section wherein the proposed text would be modified/inserted.

3. My (our) interest in and purpose for submitting the proposed Zoning Ordinance Amendment.

We attach a statement hereto indicating why, in our opinion, the change requested is necessary for the preservation and enjoyment of substantial property rights, and why such amendment will advance the public health, safety and welfare. An assessment of the impact of the proposal on the community and property of other persons in the vicinity of the amendment or affected by the amendment is also attached.

 1-31-23
(Signature of Applicant)
Green Development Ventures, LLC
2186 East Centre Avenue
Portage, Michigan 49002

(Signature of Applicant)

(Address)
(269) 365-8548

(Address)

mwest@allenedwin.com

(Phone)

(Phone)

A copy of all actions taken regarding this application shall be attached and shall be considered a part of this application.

January 6, 2023

Kelly Peterson, Director
Department of Community Development
City of Portage
7900 South Westnedge Avenue
Portage, Michigan 49002

Re: 7438 Lovers Lane (Parcel #10-08340-025-A)

Dear Ms. Peterson,

I own 7438 Lovers Lane (Parcel #10-08340-025-A) within the City of Portage, Kalamazoo County, Michigan. I confirm that Green Development Ventures, LLC/Allen Edwin Homes has authorized consent to submit for various municipal approvals and permits (land division, rezoning, building permit, etc.) that may be required for the development of this 2.16 acre parcel.

Feel free to contact me with questions or concerns.

Sincerely,

<i>Howard Kerney</i>	dotloop verified 01/05/23 11:17 AM EST 5N59-TU1L-LM0T-C65W
----------------------	--

Howard Kerney
3904 Greenleaf Circle
Kalamazoo, Michigan 49008
higandhow@aol.com
269-381-5881

Proposed Rezoning - 7438 Lovers Lane

Summary Analysis

January 31, 2023

Rezoning Request & Purpose

The 2.16 acre property addressed as 7438 Lovers Lane (parcel #10-08340-025-A) is currently zoned R-1B, One Family Residential and a zoning change to R-1T, Attached Residential is requested. The purpose of the R-1T rezoning request is to facilitate construction of two duplexes on the property which will provide additional residential housing opportunities within the City of Portage consistent with established city goals and policies.

Consistency with Comprehensive Plan/Future Land Use Map

The proposed R-1T rezoning and duplex development is consistent with the 2014 City of Portage Comprehensive Plan and Future Land Use Map which designates the subject property, along with other properties located to the north and south (along the west side of Lovers Lane), as appropriate for "Medium Density Residential" (MDR) land use. The MDR land use classification covers the transition from detached to attached dwelling units including duplexes, attached condominiums and townhomes and certain apartment buildings with a development density of up to 4-8 units/per acre corresponding to the R-1T, RM-2 and PD zoning districts.

Consistency/Compatibility with Surrounding Land Use & Zoning Pattern

The area surrounding the subject property includes a mixture of detached single family homes on large parcels, compact mobile homes, attached apartments, greenhouses and vacant land. Several higher density residential developments are situated within 1/4 mile of the subject property including a non-conforming apartment complex zoned R-1B, One Family Residential located 400' north (west side of Lovers Lane); Oak Brook Estates Mobile Home Park zoned MHC, Mobile Home Community located 1,000' north (west side of Lovers Lane); Barrington Woods Apartments zoned RM-1, Multiple Family Residential located 1,100' west (Garden Lane); Garden Lane Apartments zoned RM-1, Multiple Family Residential located 1,300' southwest (Garden Lane); and Redwood Apartments zoned PD, Planned Development located 1,300' south (west side of Lovers Lane). The proposed R-1T zone and duplex project is consistent and compatible with this surrounding land use and zoning pattern.

Environmental Considerations and Utilities

Regulated wetlands and/or floodplains are not located on the subject property. Municipal water, sanitary sewer and franchise utilities are available along Lovers Lane and will serve the two planned duplexes. Given the configuration of the property and location of utilities, duplex construction will occur along the eastern portion of the site, along the Lovers Lane frontage.



Property Address

7438 LOVERS LN
 PORTAGE, MI, 49002

This Parcel has no
 image on file.

Owner Address

KERNEY, R HOWARD & H U	Unit:	10
—	Unit Name:	CITY OF PORTAGE
3904 GREENLEAF CR		
KALAMAZOO, MI 49008-2546		

General Information for 2022 Tax Year

Parcel Number:	08340-025-A	Assessed Value:	\$35,800
Property Class:	402	Taxable Value:	\$12,049
Class Name:	402 RESIDENTIAL VACANT	State Equalized Value:	\$35,800

School Dist Code: 39140
School Dist Name: PORTAGE

PRE 2021: 0%
PRE 2022: 0%

Prev Year Info	MBOR Assessed	Final SEV	Final Taxable
2021	\$24,100	\$24,100	\$11,665
2020	\$22,000	\$22,000	\$11,504

Land Information

Acreage:	2.16
Zoning:	R-1B

Tax Description

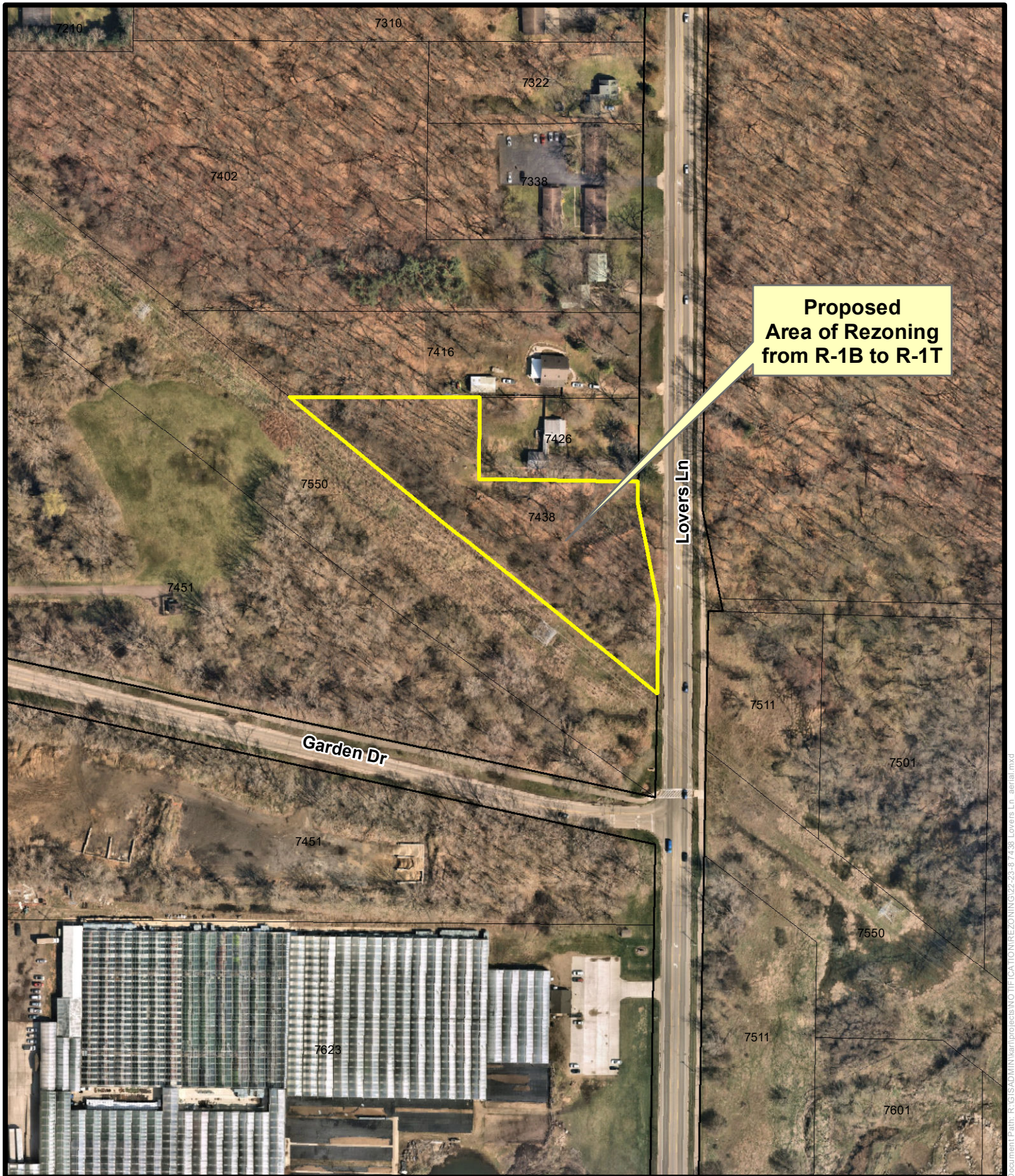
TIMBERLAND GROVE LOT 24 EXC E 250 FT ALSO LOT 25 EXC E 250 FT OF N 35 FT. ALSO TO INCLUDE SEC 15-3-11 BEG AT A PT AT NE COR NW 1/4 SE 1/4 SEC 15, TH W ALG E W 1/4 LI 178.19 FT, TH S 51 DEG 56 MIN 30 SEC E TO A PT 16.5 FT E OF E NS 1/8 LI SD SEC, TH N TO E W 1/4 LI, TH W ALG SD 1/4 LI 16.5 FT TO PL OF BEG. ALSO TO INCLUDE SECTION 15-3-11 BEG AT SE COR OF PLAT OF TIMBERLAND GROVE, TH W 162.18 FT, TH N 52 DEG W 219.72 FT, TH S 37 DEG W 25 FT, TO CONSUMERS POWER ROW, TH SELY ALG SD ROW TO E & W 1/4 LI SEC 15, TH E ALG SD LI 178.19 FT, TH NLY APPROX 25 FT TO P.O.B.

Sales Information

No Records Found

GIS/Mapping:

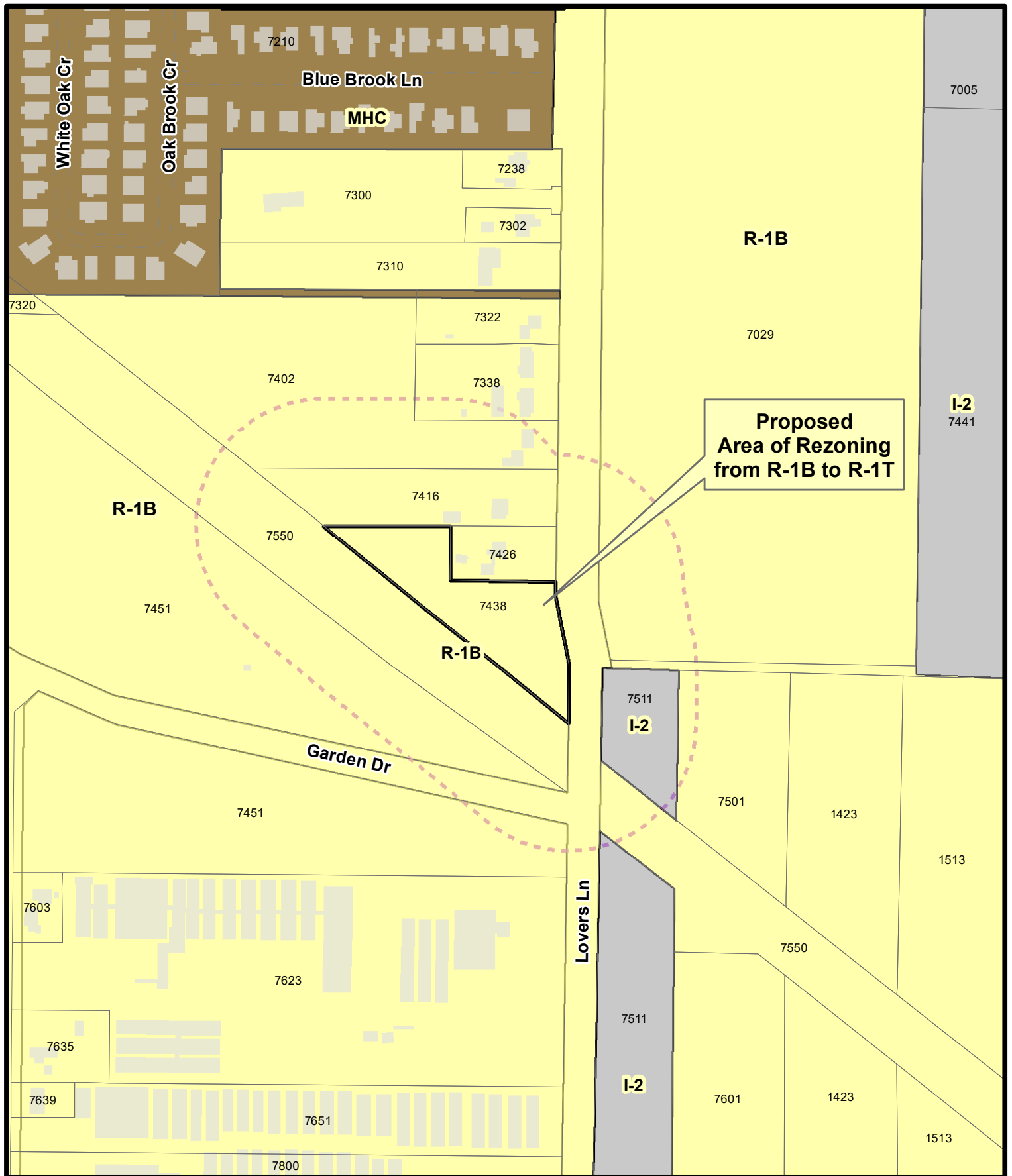
These maps are intended to be used for generalized citywide planning and there are no warranties that accompany this product. City of Portage recommends that users of this product confirm the data used in production of this map by visual inspection of the geographic area. In no event shall the City of Portage be liable to the user or any third party for errors, omission or positional accuracy of this product, regardless of the form of claim or action, whether in contract or tort, including negligence, in the amount that exceeds the sum paid by the user for the product. The City of Portage reserves all rights of authorship granted under U.S. and International copyright laws and agreements.



**Aerial Photography
Rezoning: 22/23 - 8
7438 Lovers Lane**



1 inch = 200 feet
Date: 2/3/2023
(32)



- I-2 Heavy Industry
- R-1B One Family Residential
- MHC Mobile Home Community
- 300' Notification Area
- Subject Parcel

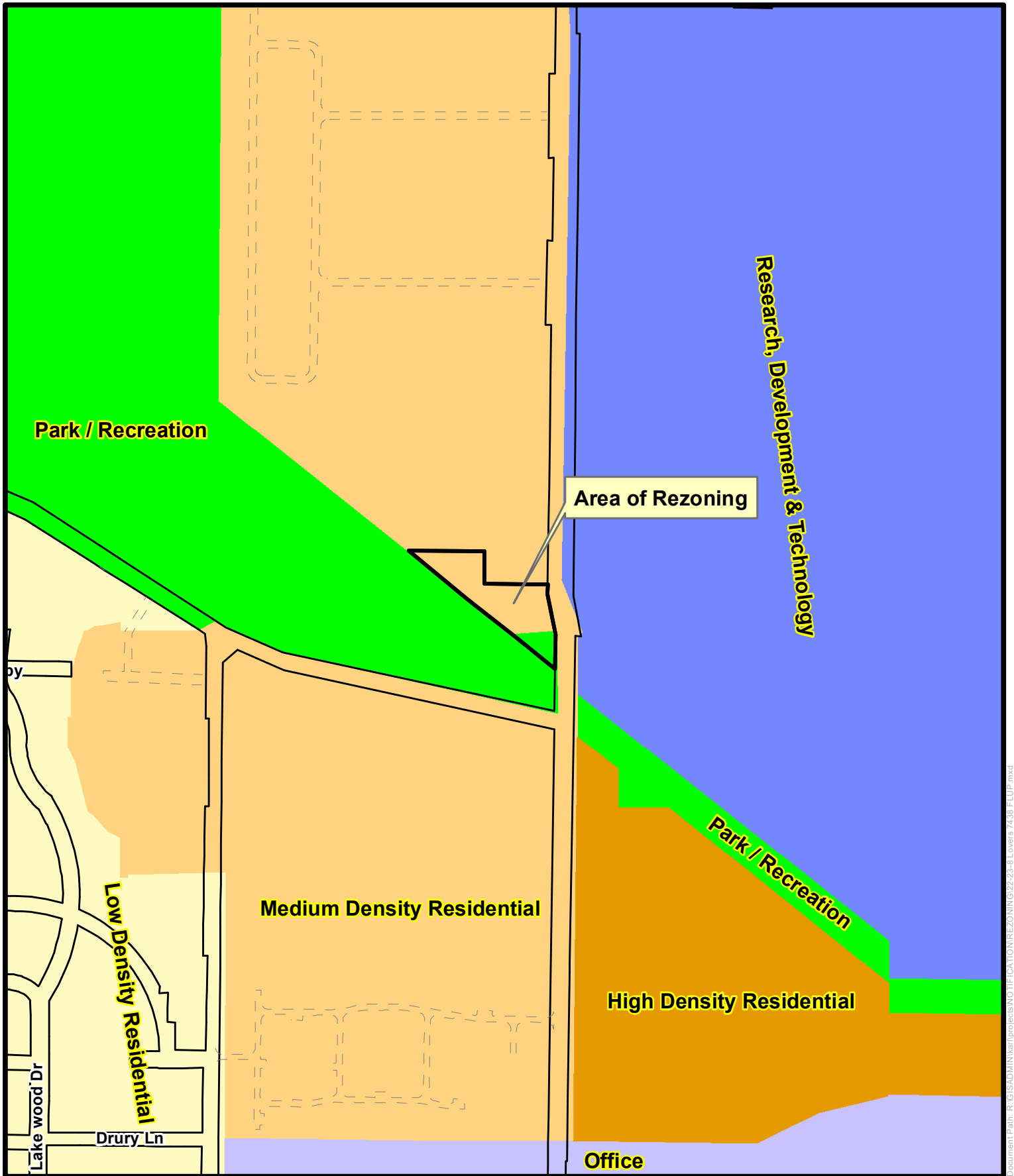
Zoning Map

Rezoning: 22/23 - 8

7438 Lovers Lane



1 inch = 300 feet



- | | |
|---|------------------------------------|
| Notification_parcel | Office |
| Low Density Residential | Shaver Road Business Corridor |
| Single-Family Detached-Medium Density Residential | Research, Development & Technology |
| Medium-Density Residential | General Industrial |
| High Density Residential | Park / Recreation |
| Local Business | Gourdneck State Game Area |
| Regional Business | Public |
| General Business | City Centre |

Future Land Use Map **Rezoning: 22/23 - 8** **7438 Lovers Lane**



1 inch = 500 feet
 Date: 2/3/2023

Staff's Site Pictures – February 14, 2023

Picture Map





Figure 1. Looking north along Lovers Lane. Forested area beyond clearing represents area of subject site.



Figure 2. Looking east along power lines. Forested area to left (north) represents area of subject site.



Figure 3. Looking north through subject site at narrowest section toward house (7426 Lovers Lane) seen in background, located to the north.

**FIRST READING
CITY OF PORTAGE, MICHIGAN
NOTICE**

TO: THE RESIDENTS AND PROPERTY OWNERS OF THE CITY OF PORTAGE AND ALL OTHER INTERESTED PERSONS.

NOTICE IS HEREBY GIVEN, that an Ordinance to amend Article 4 (Zoning) of Chapter 42 of the Codified Ordinances of Portage, Michigan, was introduced for first reading at a regular meeting of the City Council held on _____, 2023, and that the Council will hold a public hearing on the proposed amendment at the Portage City Hall in said City on _____, 2023, at 7:00 p.m. or as soon thereafter as may be heard.

NOTICE IS FURTHER GIVEN that the proposed amendment to Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan reads as follows:

THE CITY OF PORTAGE ORDAINS:

That Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan, Official Zoning Map, be amended as follows:

Street Address
7438 Lovers Lane

Parcel ID Numbers
08340-025-A

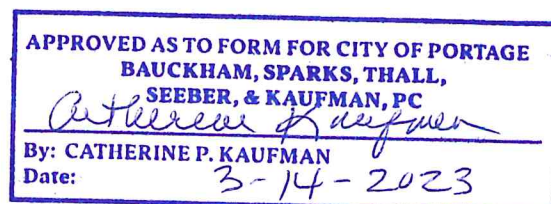
TIMBERLAND GROVE LOT 24 EXC E 250 FT ALSO LOT 25 EXC E 250 FT OF N 35 FT. ALSO TO INCLUDE SEC 15-3-11 BEG AT A PT AT NE COR NW 1/4 SE 1/4 SEC 15, TH W ALG E W 1/4 LI 178.19 FT, TH S 51 DEG 56 MIN 30 SEC E TO A PT 16.5 FT E OF E NS 1/8 LI SD SEC, TH N TO E W 1/4 LI, TH W ALG SD 1/4 LI 16.5 FT TO PL OF BEG. ALSO TO INCLUDE SECTION 15-3-11 BEG AT SE COR OF PLAT OF TIMBERLAND GROVE, TH W 162.18 FT, TH N 52 DEG W 219.72 FT, TH S 37 DEG W 25 FT, TO CONSUMERS POWER ROW, TH SELY ALG SD ROW TO E & W 1/4 LI SEC 15, TH E ALG SD LI 178.19 FT, TH NLY APPROX 25 FT TO P.O.B.

From R-1B One Family Residential District to R-1T Attached Residential District.

PLEASE TAKE FURTHER NOTICE that if the owners of at least twenty percent (20%) of the area of land included in the proposed zoning change, or if the owners of at least twenty percent (20%) of the area of land included within an area extending outward one hundred feet (100') from any point on the boundary of the land included in the proposed change, excluding public right-of-way or other publicly owned land, file a written protest petition against the proposed amendment presented to the City Council before final legislative action on the amendment, a two-thirds vote of the City Council will be required to pass the amendment.

Dated: _____

Erica Eklov, City Clerk



**ADOPTION OF ZONING ORDINANCE
CITY OF PORTAGE, MICHIGAN
NOTICE**

TO: THE RESIDENTS AND PROPERTY OWNERS OF THE CITY OF PORTAGE AND ALL OTHER INTERESTED PERSONS.

NOTICE IS HEREBY GIVEN, that an Ordinance to amend Article 4 (Zoning) of Chapter 42 of the Codified Ordinances of Portage, Michigan, was adopted by the City Council at a regular meeting held on the _____ day of _____, 2023, and will become effective _____, 2023.

NOTICE IS FURTHER GIVEN that Article 4 (Zoning) of Chapter 42, Land Development Regulations, of the Codified Ordinance of Portage, Michigan, has been amended as follows:

THE CITY OF PORTAGE ORDAINS:

That Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan, Official Zoning Map, be amended as follows:

Street Address
7438 Lovers Lane

Parcel ID Numbers
08340-025-A

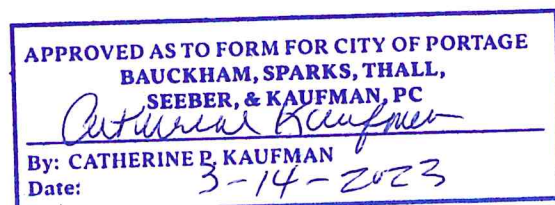
TIMBERLAND GROVE LOT 24 EXC E 250 FT ALSO LOT 25 EXC E 250 FT OF N 35 FT. ALSO TO INCLUDE SEC 15-3-11 BEG AT A PT AT NE COR NW 1/4 SE 1/4 SEC 15, TH W ALG E W 1/4 LI 178.19 FT, TH S 51 DEG 56 MIN 30 SEC E TO A PT 16.5 FT E OF E NS 1/8 LI SD SEC, TH N TO E W 1/4 LI, TH W ALG SD 1/4 LI 16.5 FT TO PL OF BEG. ALSO TO INCLUDE SECTION 15-3-11 BEG AT SE COR OF PLAT OF TIMBERLAND GROVE, TH W 162.18 FT, TH N 52 DEG W 219.72 FT, TH S 37 DEG W 25 FT, TO CONSUMERS POWER ROW, TH SELY ALG SD ROW TO E & W 1/4 LI SEC 15, TH E ALG SD LI 178.19 FT, TH NLY APPROX 25 FT TO P.O.B.

From R-1B One Family Residential District to R-1T Attached Residential District.

PLEASE TAKE NOTICE that a copy of the Ordinance as amended may be purchased or inspected at City Hall on any business day except public and legal holidays from and after publication of this Notice from 8:00 a.m. to 5:00 p.m. local time. Further, a copy of a map showing the property rezoned is also available at the time and days noted above.

Dated: _____

Erica Eklov, City Clerk



**AN ORDINANCE TO AMEND THE CODE OF ORDINANCES OF THE CITY OF
PORTAGE, MICHIGAN BY AMENDING ARTICLE 4 OF CHAPTER 42,
LAND DEVELOPMENT REGULATIONS OF THE CODIFIED ORDINANCES
OF PORTAGE, MICHIGAN**

THE CITY OF PORTAGE ORDAINS:

That Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan, Official Zoning Map, be amended as follows:

Street Address
7438 Lovers Lane

Parcel ID Numbers
08340-025-A

TIMBERLAND GROVE LOT 24 EXC E 250 FT ALSO LOT 25 EXC E 250 FT OF N 35 FT. ALSO TO INCLUDE SEC 15-3-11 BEG AT A PT AT NE COR NW 1/4 SE 1/4 SEC 15, TH W ALG E W 1/4 LI 178.19 FT, TH S 51 DEG 56 MIN 30 SEC E TO A PT 16.5 FT E OF E NS 1/8 LI SD SEC, TH N TO E W 1/4 LI, TH W ALG SD 1/4 LI 16.5 FT TO PL OF BEG. ALSO TO INCLUDE SECTION 15-3-11 BEG AT SE COR OF PLAT OF TIMBERLAND GROVE, TH W 162.18 FT, TH N 52 DEG W 219.72 FT, TH S 37 DEG W 25 FT, TO CONSUMERS POWER ROW, TH SELY ALG SD ROW TO E & W 1/4 LI SEC 15, TH E ALG SD LI 178.19 FT, TH NLY APPROX 25 FT TO P.O.B.

From R-1B One Family Residential District to R-1T Attached Residential District.

FIRST READING:

SECOND READING:

EFFECTIVE DATE:

Patricia M. Randall, Mayor

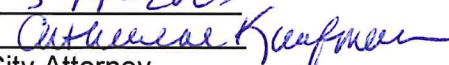
STATE OF MICHIGAN)
) SS
COUNTY OF KALAMAZOO)

I do hereby certify that I am the duly appointed and acting City Clerk of the City of Portage and that the foregoing Ordinance was adopted by the City of Portage on the _____ day of _____, 2023.

Erica Eklov, City Clerk

Approved as to Form:

Date: 3-14-2023

By: 
City Attorney

TO: Honorable Mayor and City Council

FROM: City of Portage Planning Commission

DATE: March 16, 2023

SUBJECT: Rezoning Application # 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex developments.

At the March 2, 2023 meeting, the Planning Commission reviewed and discussed the Rezoning Application # 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex developments. The applicant, Mike West, Green Development Ventures, LLC, was present to discuss the rezoning and future use of the site, and stated that he believes the proposal is compatible with the City's Comprehensive Plan. Three members of the public provided testimony and expressed opposition to the project due to perceived concerns about the size of the lot to accommodate future housing, the impacts on traffic, property value, and wildlife. The Planning Commission determined no further discussion was needed and voted to close the public hearing.

After careful consideration, the Planning Commission voted 8-0 (unanimously) to recommend to City Council the approval of rezoning application # 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex development.

Sincerely,

CITY OF PORTAGE PLANNING COMMISSION



Dan Corradini
Chairman

Attachments: March 2, 2023 Planning Commission meeting minutes.

CITY OF PORTAGE PLANNING COMMISSION

**Thursday, March 2, 2023
7:00 PM Portage
Portage City Hall Council Chambers**

The City of Portage Planning Commission meeting of March 2, 2023, was called to order by Chair Corradini at 7:00 p.m.

IN ATTENDANCE

- Biqi Zhao, Deputy Director of Planning and Zoning
- Jonathon Hallberg, Interim Director of Community Development
- Catherine Kaufman, City Attorney

ROLL CALL

Ms. Zhao called the roll: Chairman Corradini (yes); Vice Chair Joshi (yes); Fries (yes); Pezzoli (no); Baldwin (yes); Adams (yes); Youngs (yes); Kasper (yes); and Freiman (yes).

Motion by Commissioner Youngs, seconded by Commissioner Baldwin to excuse Commissioner Pezzoli. Motion carried 8-0.

APPROVAL OF MINUTES

1. Minutes dated February 16, 2023.

Motion by Commissioner Fries, seconded by Vice Chair Joshi to approve the Planning Commission Meeting Minutes of February 16, 2023, as submitted. Motion carried 8-0.

PUBLIC HEARINGS

1. Rezoning application No. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex developments.

Ms. Zhao presented and summarized the proposed rezoning application, stated various elements of the subject site and neighborhood, showed various pictures of the site, and a survey of a recently-approved land division of the subject site. She showed a table indicating differences between the existing R-1B district and proposed R-1T district. Also, she showed required R-1T development standards. Ms. Zhao indicated that the proposed rezoning requires Planning Commission recommendation and City Council vote, both at public hearings. Ms. Zhao presented staff's analysis indicating consistency with the Comprehensive Plan, and alignment with the Council's goals of attracting residential development. Ms. Zhao stated that the City has not received any public comments on this proposal until the day of this meeting (3/2/23). She concluded with the recommended action: "If no additional public comment is requested and the Commission is supportive of the proposed rezone request, staff advises the Planning Commission to recommend to City Council the approval of rezoning application no. 22/23-8 to R-1T Attachment Residential to expand residential development opportunities."

The applicant, Mike West, presented and summarized the overall size and shape of the lot; indicated that the subject site has been divided; indicated that there are multiple utility leads serving the property from Lovers Lane. He stated a conceptual development of a future duplex with a density of 1.8 units per acre, less than the maximum density of R-1T district. Mr. West addressed that he believes the proposal is compatible with the City's Comprehensive Plan; it is adjacent to other similar attached housing proposal; and requests Planning Commission support.

Chair Corradini opened public hearing. Public testimonies are as follows:

- 1) Mike Ashby, 7416 Lovers Lane. Indicated concerns about size of lot to accommodate future housing, preservation of natural vegetation for wildlife, and opposes the rezoning.
- 2) George Gerth, 7426 Lovers Lane. Indicated concerns about perceived growth impact on open space around his property, concerns about lack of site maintenance of subject site, and opposes the rezoning.
- 3) Colleen Poot, 7402 Lovers Lane. Indicated concerns about aesthetics of street corner with future development, concerns about perceived increased traffic and headlight impact from the rezoning, concerns about perceived impact to wildlife in the area, concerns about perceived future redevelopment creep in the neighborhood, and opposes the rezoning.

Motion by Commissioner Adams, seconded by Vice Chair Joshi to close public hearing. Motion carried 8-0.

Chair Corradini clarified that the Planning Commission's action on the rezoning is a recommendation. And the rezoning proposal will be forwarded to the City Council where another public hearing will be provided, and the Council will vote on the rezoning proposal.

Motion by Vice Chair Joshi, seconded by Commissioner Fries to recommend to City Council the approval of rezoning application no. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attachment Residential to expand residential development opportunities. Ms. Zhao called the roll for the motion: Chairman Corradini (yes); Vice Chair Joshi (yes); Fries (yes); Pezzoli (no); Baldwin (yes); Adams (yes); Youngs (yes); Kasper (yes); and Freiman (yes). Motion carried 8-0.

2. An additional accessory building space for a proposed pole barn at 10042 Terry Ln (parcel no: 04741-041-A) and 520 Bacon Ave. (parcel no: 04740-001-B).

Ms. Zhao presented and summarized the proposal, stated various elements of the subject site and neighborhood, showed various pictures of the site, provided a table of all existing and proposed buildings, and summarized the total existing accessory building space and proposed total accessory building space. She explained the applicable zoning code regulation for Planning Commission consideration. Ms. Zhao provided staff's analysis of the replacement of an existing accessory detached building with a proposed pole barn. She also stated that the project is consistent with the intent of the underlying zoning district and applicable sections of Comprehensive Plan. Ms. Zhao indicated that the City has received two recent public comments supporting the project, as well as the applicant's submittal of adjacent property owners' signatures of support. She concluded with the recommended action "If no additional public comment is requested and the Commission is supportive of the proposed project, staff recommends Planning Commission approval of the additional accessory building space of 1,799 square feet at 10042 Terry Lane and 520 Bacon Avenue with the following condition: Lots of 10042 Terry Lane and 520 Bacon Avenue be combined."

The applicant, Garth Whitehill, 10043 Terry Lane, presented and summarized the overall project, and stated that the project will help keep personal belongings inside a building, and spoke with adjacent neighbors about the project. He indicated that the lot combination application has been submitted to the City.

Commission Fries indicated support to streamline projects similar to this.

Chair Corradini supported the applicant's effort in contacting neighbors in the area.

Chair Corradini opened public hearing. No public hearing received. Vice Joshi made the motion, and Commissioner Baldwin supported a motion to close public hearing. Motion carried 8-0.

Commissioner Fries motioned, supported by Commissioner Adams approval of the additional accessory building space of 1,799 square feet at 10042 Terry Lane and 520 Bacon Avenue with the following condition: Lots of 10042 Terry Lane and 520 Bacon Avenue be combined. Motion carried 8-0.

SITE/FINAL PLANS

None.

NEW BUSINESS

None.

OLD BUSINESS

1. A Tentative Plan and Rezoning Application (#22/23-7), from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road.

Ms. Zhao stated that the project was continued from the January 19, 2023 Planning Commission meeting. She summarized the project site layout, conceptual building elevations, and overall number of dwelling units. Ms. Zhao explained applicable zoning regulations of the 'Planned Development' standards, applicable Comprehensive Plan elements, and relevant City Council's housing goals. She addressed the applicant's additional project request of seeking a lower parking plan and higher density. Ms. Zhao showed a chart of other proposed, existing high density residential developments throughout Portage. She addressed the Commission's pending items from the January 19, 2023, meeting and pending traffic study review and recommendation; indicating that the traffic study has been accepted by the City; and that no significant project changes were recommended. Ms. Zhao concluded with the recommended action "Staff advises the Planning Commission to recommend to City Council the approval of the Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road with the following conditions:

- 1) a written confirmation of rights to use the condominium common parcels for potential parking and access, which shall be submitted to the city prior to the Final PD Site Plan review and approval.
- 2) if the proposed parking on the common area is not allowed, to approve the submitted alternative plan for contingency parking.
- 3) the proposed 'live/ work' units shall be consistent with the requirements of Building Code Section 419 'Live/ Work Units' and Zoning Code Sec. 42-137 'Work/ Live Accommodations'.
- 4) An updated site plan shall be submitted for Final PD Site Plan review showing the northern driveway along Shaver Road be designed with a dedicated left-turn and right-turn egress lanes."

Commissioner Freiman expressed concerns about the development impacting wetlands and perceived impacts from the adjacent Fire Department and its operational uses. He did state support of the development, including creating a need for housing, the development being located close to amenities, and having walkable, bikeable elements.

The applicant (attended virtually), John McGraw, stated that a wetlands delineation was established in 2006 which showed no mapped wetlands within the developing area. However, current wetland map shows an increase in wetland area which stretches in the area of proposed buildings. Mr. McGraw indicated this development plan is tentative, and discussions with the State Environmental Great Lakes and Energy Department (EGLE) are underway.

Chair Corradini stated concerns about traffic increase and turning movements at access points along W. Centre Avenue and Shaver Road; indicated concerns about reducing parking allowance; stated concerns about impact to the mapped floodplain and raising flood waters encroaching onto the subject site; indicated concerns about the adjacent Fire Department operations and access impacting the proposed development and vice versa; and stated concerns about the project's considerable higher density than what is allowed under the 'Planned Development' regulation and its effect on traffic levels. He also stated the City should examine a comprehensive pedestrian network for the underlying City Centre Plan; needed sidewalk improvements along Centre Street; and add public improvements to the City's Capital Improvement Program (CIP).

Commissioner Baldwin expressed concerns about the Fire Department operations impacting the development; concerns about internal traffic circulation between the proposed development and existing development in the neighborhood.

Commissioner Kasper stated that she shares concerns about parking and desired more parking to be provided but indicating that the development would meet the needs of the area.

Vice Chair Joshi stated that she is not fully convinced of the walkability of the site and had concerns about flooding.

Commissioner Youngs expressed concerns about the high density, parking, and access points.

Commissioner Fries stated that other development in the greater neighborhood were required to install sidewalks and shared concerns about needing a plan for addressing pedestrian network in the area.

Commissioner Fries motioned, seconded by Commissioner Adams the Planning Commission to recommend to City Council the approval of the Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road with the following conditions:

- 1) a written confirmation of rights to use the condominium common parcels for potential parking and access, which shall be submitted to the city prior to the Final PD Site Plan review and approval.
- 2) if the proposed parking on the common area is not allowed, to approve the submitted alternative plan for contingency parking.
- 3) the proposed 'live/ work' units shall be consistent with the requirements of Building Code Section 419 'Live/ Work Units' and Zoning Code Sec. 42-137 'Work/ Live Accommodations'.
- 4) An updated site plan shall be submitted for Final PD Site Plan review showing the northern driveway along Shaver Road be designed with a dedicated left-turn and right-turn egress lanes.

Motion carried 8-0

STATEMENT OF CITIZENS

George Gerth recalled historic road conditions in Portage and land ownership around 7438 Lovers Lane.

STATEMENT OF COMMISSIONERS/ STAFF

Commissioner Freiman expressed sympathetic concerns with public testimony regarding the rezoning of 7438 Lovers Lane on the agenda, stated the rezoning process and the purpose of the Comprehensive Plan, and indicated a growing demand for housing for the community. He also stated that many wildlife and trees are located on private property and can be development as allowed under City processes. Further, he indicated that those natural settings could be generally preserved if purchased for non-development purposes.

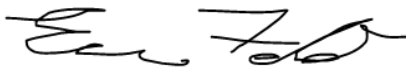
Chair Corradini commended local and regional staff response during the recent ice storm.

Ms. Zhao reminded the public and Commission about the City's Master Plan visioning workshop on Monday, March 20th at 5:30pm at the Portage Zhang Senior Center.

ADJOURNMENT

There being no further business to come before the Commission, Chair Corradini adjourned the meeting at 8:44 p.m.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Eric Feldt".

Eric Feldt, AICP, CFM
City Senior Planner

TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: Rezoning Application No. 22/23-7 to rezone 412 W. Centre Avenue and 7860 Shaver Road from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development

SUPPORTING PERSONNEL: Jonathon Hallberg, Interim Director of Community Development

ACTION RECOMMENDED: Receive a Tentative Plan and Rezoning Application No. 22/23-7 to rezone 412 West Centre Avenue and 7860 Shaver Road from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development, and set a public hearing for April 18, 2023.

River Caddis Development, LLC submitted a mixed-use development proposal at 412 West Centre Avenue and 7860 Shaver Road and has filed a Tentative Plan and Rezoning application to rezone the property from Commercial Planned Development (CPD) to Planned Development (PD). The site is located along the west side of Shaver Road adjacent to Walgreens and City of Portage Fire Station No. 1. Table 1 details the proposed buildings' use, height, and location. Figure 1 illustrates the proposed development.

Table 1. Summary of the proposed buildings' use, height, and location

Building No.	No. of Stories	Height (ft)	Apt. Units	Use	1-BR Units	2-BR Units	Commercial Size (sq ft)	Setback distance (ft) to closest Lot line
1	3	38	12	Live/ Work + Apts.	4	8	980	42
2	3	38	12	Live/ Work + Apts.	4	8	980	30
3	3	45	36	Apartment	24	12	—	5
4	3	45	36	Apartment	24	12	—	40

5	3	45	36	Apartment	24	12	—	67
6	3	45	36	Apartment	24	12	—	86
7	3	45	36	Apartment	24	12	—	30
8	3	45	24	Apartment	24	0	—	25
9	1	24	—	Community Building	—	—	—	65
		Total	228	Total	160	76		

Figure 1. Rendering of Proposed Development



The project proposes two access points along Shaver Road and one along West Centre Avenue. From each driveway, vehicles will navigate a circular layout to reach parking spaces nearby and directly in front of each apartment building. With a total of 228 proposed apartment units on the overall 10.6-acre site (a combination of 412 West Centre Avenue and 7860 Shaver Road), the project has a density of 21.5 units/acre.

The development consists of a mix of residential and urban mixed-use, generally comprising three-story buildings. The two proposed live/work buildings are designed with an urban commercial presence with tall, glass ground-floor entrances and upper residential floors with multiple windows. The six apartment buildings in the rear of the site form a large circular residential mass, surrounding a community building and outdoor swimming and recreational features. The applicant's conceptual renderings show a modern building appearance with a mix of brick, vinyl, and decorative masonry features.

The applicant has indicated an anticipated start of construction in fall 2023/spring 2024. According to the applicant, both properties comprising the site are currently under contract. The property owner (PCL Curtis, LLC) is expected to sell both subject properties to the applicant (River Caddis Development, LLC) if approvals are obtained. The applicant currently has an active purchase agreement in place with PCL Curtis, LLC, which has been informed of the proposed PD tentative plan review process. A consent letter from the property owner, PCL Curtis, LLC, is attached. Further, the project's three access points are located on two separate parcels, owned by Portage Creek Landings City Centre Condominium. Per the applicant, these parcels are dedicated as common areas for future access to abutting property. These two parcels are expected to remain under existing condominium ownership. The applicant is currently confirming the rights to use the common area for potential parking and access related to the project. As of the date of this report, confirmation has not been provided to the city. If parking is not allowed within the common area, the applicant has provided contingency (deferred) parking within the subject site on the proposed open space near the tennis/pickleball courts. This contingency parking is shown in the attached alternative site layout drawing.

The existing site contains two buildings and consists of a variety of natural vegetation, a portion of Portage Creek, and wetlands. The site has been used for miscellaneous temporary staging of construction materials. Table 2 summarizes the existing conditions in the general area.

Table 2. Summary of the existing conditions

Existing Land Use/ Zoning	• The subject site is undeveloped and zoned Commercial Planned Development (CPD). • <u>North</u>: City of Portage Fire & Police Stations, Central Park; 7810 Shaver Rd; Zoned OS-1 Office. • <u>South</u>: Walgreens pharmacy; 7920 Shaver Rd; Zoned CPD. • <u>East (across Shaver Rd)</u>: City of Portage City Hall; 7900 S. Westnedge Ave; Zoned OS-1 Office. • <u>West</u>: Undeveloped rear properties of City of Portage Central Park and Hoeksema Brothers Greenhouses; 7810 Shaver Rd and 515 Schuring Rd; Zoned RM-2 Multifamily Residential and I-1 Light Industrial.
Public Streets	Surrounding roadway network: • Shaver Road (S. Westnedge Ave. - W. Centre Ave.): Public Street, 2021 AADT Trip Count of 13,990 trips.

	• S. Westnedge Ave & Shaver Rd Intersection: Public Street, 2021 ADT Trip Count of 21,196 trips. • W. Centre Street (Shaver Rd. - S. Westnedge Ave.): Public Street, 2017 ADT Trip Count of 17,613 trips Annual Average Daily Trips (AADT) trip counts are provided by Kalamazoo Area Transportation Study (KATS).
Public Utilities	City sanitary sewer and water are available along Shaver Road.
Environment	The subject site contains two buildings but is largely undeveloped, consisting of a forested area with a mix of natural vegetation.
Unique Conditions	Mapped wetlands and flood hazards exist on the site; both are shown on the applicant's drawings. No mapped historic buildings or structures exist on the subject properties.

Applicable Zoning Regulations

The following sections of Chapter 42. Division 4. Zoning Districts and District Regulations apply and are addressed further in this report:

- [Subdivision 11](#) – PD, Planned Development District, and
- [Division 8](#) – Administration and Enforcement (for Rezoning Application)

Proposed Planned Development Tentative Plan

The applicant has submitted a Tentative Plan and Rezoning application seeking approval for a mixed-use development of commercial and multifamily housing facility per Sec. 42-375. The Planned Development review process involves the following two steps, per [Sec. 42-375](#):

Step 1) Tentative Plan review (Items A-G, Sec. 42-375) identifies part(s) or whole project features; analyzes the impact on neighborhoods, streets, utilities, and the natural environment; and determines consistency with adopted local plans. This step does not require detailed engineering drawings. *The filed Tentative Plan is at this step.*

Step 2) Final Plan review (Items H-M, Sec 42-375), identifies and analyzes detailed drawings of project improvements (streets, utilities, lot dimensions, etc.). *A Final Plan application has not been submitted at this time, awaiting approval of the Tentative Plan.*

The Planning Commission reviewed the project for consistency with Sec. 42-375 Tentative Plan items A-E during a public hearing on January 19, 2023, Planning Commission meeting, continued deliberation and provided a recommendation to the City Council on March 2, 2023, Planning Commission meeting. The applicant has submitted a site layout drawing showing the location of buildings and parking areas, building setback distances, access and adjacent streets, pedestrian pathways and linkages, and open space. The applicant has also submitted a project narrative describing the overall project, types of housing units, live/work elements, parking configuration, etc., and illustrations depicting various renderings of building elevations, general landscaping plan, etc. These submittals address items A-E within Sec. 42-375.

Per Sec. 42-373 and -374, the Planned Development (PD) allows a variety of housing styles, flexibility in building heights, and yard setbacks. The underlying CPD does not permit any housing units. Therefore, the applicant seeks a rezoning to PD. The following project elements are unique to the PD district and overall project:

1. **Housing Types.** A minimum of two housing types is required under the PD per Sec. 42-374(C). The development consists of the following different housing types:
 - a. Live/ Work units (Buildings 1 & 2). These are designed at the ground-floor level with approximately half of the overall space split between a commercial area facing Shaver Road and the other half as residential facing west (toward Building 3).
 - b. Apartment flats consisting of 1- and 2-bedroom options (Buildings 3-8).
2. **Building Setbacks.** Per Sec. 42-374(E), the PD district does not have a defined setback distance. However, a setback distance should be established to create a transitioning area for neighborhood harmony. The proposed building setbacks to adjacent property lines are provided in Table 1.
3. **Density.** The PD district allows an overall maximum density of seven units per acre, per Sec. 42-374(D). The applicant is seeking flexibility in density to allow a project density of 21.5 units per acre. The applicant finds that the proposed density will help achieve rent rates for the location, as noted in their project documents (see attachments). This request is addressed further later in this report.
4. **Parking.** The applicant is providing 359 parking spaces for the overall proposed 228 units, resulting in a 1.51 ratio of spaces/unit. Per Sec 42-521, two parking spaces shall be provided for each unit of a multifamily housing proposal. Therefore, a total of 456 spaces is required. The applicant is seeking approval for a reduction in parking requirements per Sec 42-520(O), as noted in their project documents (see attachments). This request is addressed further later in this report.
5. **Utilities.** The project is expected to connect to existing city water and sewer utilities along Shaver Road. Stormwater will be designed under the parking lot near Buildings 6 and 7, as identified in the site layout drawing. Detailed drawings of utility connections and stormwater infrastructure will be provided in the next step - Final PD (Site) Plan Application.
6. **Access.** The proposal shows access to Shaver Road and West Centre Avenue through three existing access driveways located on adjacent property owned by Portage Creek Landings City Centre Condominium (as mentioned earlier in the report). Due to the anticipated high traffic volume from the proposal and the existing high traffic on the adjacent roads, the City Administration requires the applicant to submit a Traffic Impact Study (TIS). This is discussed in detail later in this report.
7. **Pedestrian Infrastructure.** Pedestrian connections will be provided within the interior of the development, between buildings, and along the perimeter to connect to existing sidewalks along Shaver Road and W. Centre Avenue. According to the applicant, both properties comprising the site are currently under contract. The property owner (PCL Curtis, LLC) is expected to sell both subject properties to the applicant (River Caddis Development, LLC) if approvals are obtained. The applicant currently has an active purchase agreement in place with PCL Curtis, LLC, which has been informed of the proposed PD tentative plan review process. A consent letter from the property owner, PCL Curtis, LLC, is attached. Further, the project's three access points are located on two separate parcels, owned by Portage Creek Landings City Centre Condominium. Per the applicant, these parcels are dedicated as common areas for future access to abutting property. These two parcels are expected to remain under existing condominium ownership. The applicant is currently confirming the rights to use the common area for potential parking and access related to the project. As of the date of this report, confirmation has not been provided to

the city. If parking is not allowed within the common area, the applicant has provided contingency (deferred) parking within the subject site on the proposed open space near the tennis/pickleball courts. This contingency parking is shown in the attached alternative site layout drawing.

Staff analysis is prepared based on items A-G, Sec 42-375 Tentative Plan ‘Planned Development’ requirements, Comprehensive Plan, surrounding development patterns, and general land use considerations. Issues to be analyzed include consistency with the Future Land Use Map, suitability of the existing zoning classification, and preliminary evaluations from the Development Review Team (DRT).

Comprehensive Plan

Rezoning applications are reviewed for consistency with the 2014 City of Portage Comprehensive Plan, which establishes long-term land use goals and the Future Land Use Map. The Future Land Use map designates the subject property as “City Centre”, which is characterized as the “downtown” of Portage and provides core activities for public facilities and destinations. Further, the City Centre is envisioned for shopping, dining, financial, residential, and government uses. This designation is located in the center of Portage, stretching from the Portage Public School Central Middle/High School, north to the city’s Department of Public Works building, west to Perry Street & West Centre Avenue, and east to Waylee Street and East Centre Avenue. Most of the City Centre is zoned OS-1 Office and contains a mix of local government offices and commercial uses, such as dining, shopping, and service-oriented businesses.

The subject site is within close proximity to many shopping and dining options. Those businesses are likely to benefit from customers and foot traffic generated by this development. There are existing sidewalks and pathways that connect to and provide recreational opportunities. Metro Transit has an existing bus stop near the subject site offering future residents public transportation options to travel within Portage and the greater Kalamazoo area.

Therefore, staff finds that the proposed Tentative Plan and Rezoning for a mixed-use development which provides a mix of housing types meets the intent of the Comprehensive Plan.

Zoning Map & Impacts

The subject site is currently zoned Commercial Planned Development (CPD), permitting a variety of commercial uses which have a ‘planned’ interconnectedness and mutually supportive compatibility. The adjacent properties to the south (Walgreens pharmacy, Huntington Bank, The Little Gym of Kalamazoo, etc.) are also in the CPD. Those businesses and the subject site were designed with common vehicular access points connecting to Shaver Road and W. Centre Avenue (the three access points mentioned earlier in this report). The project will utilize the existing access points as intended for future development. The adjacent properties to the north (City of Portage Fire Station, Police Station, and Central Park) and to the east, across Shaver Road, (City of Portage City Hall) are zoned OS-1 Office, permitting mainly office-type businesses such as banks, CPAs, real estate/architects, etc. and some service-oriented uses such as salons, spas, etc. The city buildings have varying operations, from typical office settings to emergency access needs.

The applicant is seeking to rezone the site to Planned Development district ‘PD’ to allow for a mix of housing and commercial types, and densities. The PD district permits the proposed type and scale of housing and commercial uses (live/ work). This land use benefit is also aligned with the CPD intent of

mutually supportive compatibility. If approved, the future residences of the proposal will benefit the live/work businesses and also existing adjacent and area businesses.

Staff finds the proposed Tentative Plan and Rezoning meets the intent of the Comprehensive Plan, Future Land Use Classification, and zoning code.

City Council Goals and Priorities

On December 20, 2022, the City Council approved the City of Portage “[2022 Attainable Housing Plan](#)” comprising a nine-point action plan to facilitate housing in the city. It includes three ideals to guide the plan: enabling Portage workers to live in Portage, enabling Portage residents to age within their house or within Portage, and providing more housing for households with income levels up to 120% AMI (Area Median Income). The current proposal of 228 housing units is found to be in alignment with this housing plan. The proposed development is also in alignment with City Council’s [2022-2023 Strategic Priorities](#) to “attract residential development that provides a mixture of housing for all income levels.”

Environmental Impact

The proposal avoids the majority of wetlands and the flood zone of Portage Creek. However, a small portion of wetlands will be affected, as delineated in the attached site plan. The applicant intends to gain approval to build on the wetlands by purchasing wetland credits from an approved wetland bank per the Michigan Department of Environmental, Great Lakes, and Energy (EGLE). Detailed plans and/or documentation will be provided during the Final PD Plan submittal.

The proposal will also impact a small area of the 100-year flood zone of Portage Creek, which is delineated in the attached site plan. The applicant will seek approval from EGLE and the Federal Emergency Management Agency (FEMA) to fill and build in a manner consistent with the state and federal flood requirements. Detailed plans and/or documentation will be provided during the Final PD Plan submittal.

Planned Development - Sec 42-374 Site Development Requirements and Sec 42-375 Plan review and approval (PD, planned development); Tentative Plan

Staff finds most of these sections of the PD are met with the submitted application. The following addresses in greater detail items not met, but where the applicant is seeking additional support:

1. Increased Density. The applicant is seeking Planning Commission approval to exceed the maximum density to help achieve various rents. The proposed density is 21.5 units/acre, whereas the maximum allowed density in the PD district is 7 units/acre. The applicant has identified an opportunity to bring highly desirable, market-rate housing into the city, based on the following factors:

- Based on the [2022 Kalamazoo County Housing Plan](#), there is a housing shortage of 7,000+ units throughout the county. This proposed development helps fill the gap in housing needs within the City of Portage by providing additional units, diversifying the types of housing opportunities available, and freeing up other units within the housing spectrum.
- The proposed development responds to not only the needs of the community but also market potential, as detailed in the “2020 Residential Market Analysis” prepared by Landuse USA for the City of Portage, which identified a market potential for adding up to 1,094 new units annually in Portage.

- The proposed development is well-supported by services within walking as well as public transportation, which complement and provide a strong environment for increased density:
 - New internal and external sidewalks will connect to existing sidewalks along adjacent streets.
 - Metro Transit has a bus stop within close walking distance to the site adjacent to Walgreens along West Centre Avenue.
 - There are existing connecting sidewalks and pathways to recreational areas and adjacent shopping, dining, and entertainment.
 - Increasing housing density (residents) in this area will support adjacent and nearby businesses.
 - The proposed design and scaled architecture offer ample greenspace and amenities to support the density proposed. The project seeks to create a strong sense of community and establishes a walkable “neighborhood” that will serve as another attractive living option in the city.
- The City Administration and City Council have approved past multifamily projects exceeding seven units per acre where additional site amenities were provided and/or existing.

Therefore, staff finds the proposed density acceptable.

2. Reduction in Parking Requirement. The applicant is seeking Planning Commission approval for 359 spaces instead of the required 456 spaces per Sec. 42-520(O). The applicant’s proposal consists of 160 one-bedroom units, 76 two-bedroom units, and 8 units within the ground-floor Live/ Work buildings. The applicant finds that the proposed 359 spaces (1.5 spaces per unit) will adequately meet the parking demand of the proposed 228 units of the above mix of bedrooms, based on the following factors:

- The applicant has extensive recent experience with multi-family developments and, in particular, those developments in a setting such as this that are well served with adjacent services, amenities, a walking network, and public transportation. These types of conditions have confirmed a parking need in the 1.00 to 1.40 vehicle spaces per unit, well below the 2.0 spaces required in Section 42-523.
- Section 42-520(O) allows a 25% reduction (in this case allowing a reduction of up to 114 spaces) for several factors including pedestrian connectivity to adjacent services, proximity to public transportation, and other factors.
- 67% or 2/3rds of the proposed residential development is comprised of one-bedroom units.
- The site has meaningful and extensive pedestrian connectivity as highlighted in the attached concept site plan.
- The site is within close walking distance to a Metro Transit bus stop at West Centre Avenue, offering public transportation choices and reducing reliance on personal cars.
- The site is within walking distance of schools, shopping, dining, and entertainment destinations.
- The proposed development will have ample on-site bike storage and bike repair stations.
- The parking reduction allows for increased greenspace and residential amenities.

Therefore, staff supports the lower parking request of 359 spaces for the proposed development.

Preliminary Evaluations from the Development Review Team (DRT)

This project was reviewed by the Development Review Team (DRT) which ensures that the proposed development is consistent with the city's infrastructure, engineering, and other requirements including streets, sewers, water mains, stormwater, parking, landscaping, and others. The DRT is comprised of representatives from the Department of Transportation and Utilities, Fire Department, Department of Parks and Recreation, Office of the City Assessor, and Department of Community Development.

- **Traffic Review:** DRT received a Traffic Impact Study (TIS) on January 17, 2023, for the Tentative Plan review. This was received two days prior to the January 19, 2023, Planning Commission meeting. As a result, staff review of the TIS was not completed nor accepted in time for Commission consideration. As of February 23, 2023, staff has reviewed the TIS, communicated minor changes (e.g. traffic modeling, etc.), and requested an updated TIS. Minor Changes are attached in an email dated February 23, 2023. The only TIS recommended site plan change was the redesign of the northern driveway along Shaver Road from a 'right-in' and 'right-out' to full access, and to have dedicated left-turn and right-turn egress lanes. No other site plan changes were recommended. The City of Portage Traffic Engineer has accepted the updated TIS for this project based on updated modeling results, per the attached email dated February 23, 2023. The updated TIS reflecting additional narrative changes as a result of the modeling is forthcoming but was not received by February 24, 2023.
- **Utilities Review:** DRT has made the applicant aware of additional engineering drawing requests pertaining to new city water and sewer, and private stormwater elements. These are detailed engineering plans that will be submitted for the Final PD Site Plan review. It is expected that a completed TIS will be provided within 7-10 days.
- **Other Site Plan Elements:** DRT has made the applicant aware of a required gate at the southern interior entrance to the Fire Station to prevent public access through the Fire Station site. The applicant will build the requested gate into the project. The Fire Department has informed the applicant they must ensure the site access aisle meets minimum vehicle access requirements. This detailed dimension must be addressed in the Final PD Plan review. DRT has made the applicant aware of anticipated future parking demand related to nearby Central Park events that may overflow onto the adjacent property. Further, information has been provided to the applicant on building code and ordinance requirements related to the design of the live/work units.

Public Noticing Requirement

Required public notice was sent to all property owners/occupants within 300 feet of the subject property on January 3, 2023. A public notice was also published in the Kalamazoo Gazette on January 3, 2023. As of the date of the last report (January 13, 2023) and this report (February 23, 2023), staff have not received any public comment.

January 19, 2023, Planning Commission Meeting

On January 19, 2023, the Planning Commission discussed Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 West Centre Avenue and 7860 Shaver Road. The Chairperson opened the public hearing and later closed it after receiving public testimony from one person. This testimony is provided in the meeting minutes. Staff's presentation of the project and staff report concluded that the project is consistent with the intent of the proposed 'Planned Development' district and Master Plan. However, the required Traffic Impact Study (TIS) was submitted late and not reviewed for acceptance by the city in time for the Commission's consideration. Therefore, staff recommended two options, summarized as the following:

1. Provide a recommendation to City Council with conditions; or
2. Postpone action on the project to a future Planning Commission meeting while awaiting staff review of the TIS. These two conditions are provided in the 1/19/23 staff report.

The Planning Commission voted on Option 2. During deliberation, the Planning Commission had the following additional concerns for staff which could not be answered at that time:

- Q. How many dwelling units would be allowed on the property if rezoned to RM-1 Multifamily District?
 - 73 Units (2-bedrooms),
 - 110 Units (1-bedroom), or
 - Mix of 1, 2-bedrooms between 73 and 110 units.
 - No Live/ Work Allowed in RM-1 Districts
- Q. What was the recommended number of housing units needed as noted in a 2016 rental needs study?
 - Staff could not locate a study of this nature related to the City of Portage.
- Q. How many units have been built since 2016?
 - The number of residential dwelling units permitted between January 1, 2016, and December 31, 2022:
 - Single-family detached units: 528
 - Single-family attached units: 288 (typically 2 – 4 units per building)
 - Apartments units: 279 (this does not include Tall Timbers)
- Q. Were pedestrians/ bicyclists considered in the traffic impact study?
 - No, because it is not required under the MDOT TIS Guidelines, which are the standard guidelines used for engineers who prepare a TIS for projects.

March 2, 2023, Planning Commission Meeting

A public meeting for this Tentative Plan and Rezoning application was continued at the March 2, 2023, Planning Commission meeting. During the meeting, the Commission discussed the proposed rezoning. The applicant, John McGraw, River Caddis Development, LLC, and the applicant's architect, Mike Corby, Integrated Architecture, attended virtually to discuss the proposed rezoning and tentative plan and answered the Commission's questions. After careful consideration, the Planning Commission voted unanimously (8-0) to recommend to City Council the approval of the Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road with the following conditions:

1. A written confirmation of rights to use the condominium common parcels for potential parking and access, which shall be submitted to the City prior to the Final PD Site Plan review and approval.
2. If the proposed parking in the common area is not allowed, approve the submitted alternative plan for contingency parking.
3. The proposed 'live/ work' units shall be consistent with the requirements of Building Code Section 419 'Live/Work Units' and Zoning Code Sec. 42-137 'Work/Live Accommodations'.

4. An updated site plan should be submitted for Final PD Site Plan review showing the northern driveway along Shaver Road as being designed with dedicated left-turn and right-turn egress lanes.

Recommendation

It is therefore recommended that City Council receive a Tentative Plan and Rezoning Application No. 22/23-7 to rezone 412 W. Centre Avenue and 7860 Shaver Road from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development, and set a public hearing for April 18, 2023.

FUNDING: Not Applicable

- Attachments:**
1. Rezoning Application
 2. PD Application
 3. Applicant's Narrative and Proposed Tentative Plan
 4. Comprehensive Plan Future Land Use Map
 5. Vicinity Map
 6. Zoning Map
 7. Applicant's Supplemental Information, Revised Tentative Plan, Alternative Parking Concept; 01.11.23
 8. Staff's Site Pictures
 9. Public Comment Received_011523
 10. Revised Site Plan received_011723
 11. Traffic Impact Study received_011623
 12. City Traffic Engineer Email_022323 (1)
 13. City Traffic Engineer Email_022323 (2)
 14. Revised Traffic Impact Study received_022423
 15. Planning Commission Meeting minutes_011923
 16. 1st Reading
 17. Planning Commission Meeting minutes_030223
 18. Planning Commission Transmittal Letter_031623

ZONING MAP OR ZONING TEXT AMENDMENT INFORMATION

This information is intended to assist the applicant in the process to 1) amend the official zoning map and/or 2) change an existing or add a new Zoning Code Regulation contained in the municipal code (Article 4 of Chapter 42, Land Development Regulations) pursuant to Section 42-651. Questions regarding the amendment process should be directed to the Department of Community Development at (269) 329-4477.

Overview

The official zoning map for the City of Portage delineates the location and boundaries of the zoning districts described in the Zoning Code. A Zoning Code regulation is a provision contained in the City of Portage Municipal Code that regulates development of land including principal and permitted uses, lot size and building setbacks, site plan review, off-street parking, site lighting, among other provisions.

Periodically, the Zoning Code regulations and/or zoning map require updating as a result of changes to community goals and objectives that govern land use development, modifications to business operations, changes in construction technologies, land use patterns, improved customer service, among several others. An amendment may be proposed in conjunction with a proposal to amend to the City of Portage Future Land Use Plan Map contained in the Comprehensive Plan if the proposed zoning map or text amendment is inconsistent with the Comprehensive Plan. Regardless of whether a Comprehensive Plan amendment is involved, all zoning code and/or zoning map amendments must be submitted consistent with application process requirements.

Who May Request a Zoning Amendment?

Any person or entity (e.g., city resident, property owner, City Manager, Planning Commission, City Council) may initiate a Zoning Code text or zoning map amendment. If a zoning map amendment involves a larger area and several parcels of land, a petition signed by the effected property owners acknowledging and supporting the zoning change must accompany the application form.

Application Fee

The application fee to process a Zoning Code regulation amendment remains at \$850. A Zoning Map amendment is \$1,130 for the first acre plus \$80 for each additional acre. The review fee is intended to recover costs associated with required legal notices, public hearings and a limited amount of staff/attorney time necessary to process each application.

Review procedure

1. Application. Completion of the attached application form is the first step in the process to request an amendment to a Zoning Code regulation or Zoning Map. The application form and current Community Development Fee Schedule is available on-line at www.portagemi.gov/Departments/Community-Development/PermitsInformationalForms.aspx and at City Hall in the Department of Community Development. In addition to the application form, other related application materials that explain the request and application fee must also be submitted. A pre-application meeting with city staff is encouraged prior to submittal of a rezoning application.
2. Consistency with adopted Land Use Goals and Objectives. An application for a Zoning Amendment will be evaluated based on adopted land use goals and objectives including those contained in the Comprehensive

Plan. The applicant should become familiar with the Comprehensive Plan and in particular Chapter 4, Land Use and the Development Guidelines contained in Chapter 7, Implementation for general guidance on the appropriateness of a zoning change. The Comprehensive Plan, including the Development Guidelines, is available on-line at www.portagemi.gov. Department staff is also available to provide the applicant assistance in evaluating the proposed zoning amendment in relation to important community goals and objectives.

The Development Guidelines are intended to be used in the review of development proposals, including zoning changes. The guidelines provide direction and underpinning for regulations that affect land use, including zoning changes.

The following guidelines are intended to provide the applicant with a general indication that the proposed zoning change is (in)consistent with adopted community goals and objectives before the application is submitted:

- ✓ Have circumstances changed since establishment of the current zoning map or zoning district to warrant the proposed amendment?
- ✓ Is the request consistent with applicable policies, recommendations of the Plan and/or Future Land Use Plan Map?
- ✓ Are the uses allowed in the requested zoning district appropriate for the area given the size and character of the site and surrounding land uses?
- ✓ Can traffic associated with the project be accommodated by the existing transportation network?
- ✓ Will the effects of the proposed zoning change and/or land uses negatively impact adjacent or nearby residential neighborhoods or environmentally sensitive areas? If so, can the effects be adequately mitigated?
- ✓ Can the potential land uses allowed in the zoning district be accommodated by the existing utility infrastructure and services? Development should be in areas that are or are planned to be served by public utilities and services.
- ✓ Is there a lack of available land zoned the same or similar to the requested zoning district, including land that could be redeveloped?
- ✓ Refer to Chapter 7 for other applicable Development Guidelines related to a specific zoning request.

If the zoning change request is not consistent with the Comprehensive Plan, an amendment to the Plan can be considered

3. Public Hearing/Comment. The City of Portage will provide public notice and an opportunity for public comment. Once all required information has been received, the application will be scheduled for the next available Planning Commission meeting. The Planning Commission meets the first and third Thursday of every month and a complete application must be submitted at least 30 days in advance of the first hearing date. State law and local ordinance require 1) notification in a newspaper of general circulation and 2) notice to property owners/occupants at least 15 days before the date of the public hearing. The applicant or his/her representative must be present during the public hearing process.

4. Planning Commission and City Council Review. The Planning Commission policy regarding changes to a Zoning Code regulation or Zoning Map is to convene a public hearing over the course of two meeting dates. During this time, the Commission will evaluate the proposed amendment including public comment and the professional staff recommendation. At the conclusion of the second meeting date, the Commission will provide a formal recommendation to the City Council. Upon receipt of the Planning Commission recommendation and application materials, the City Council will set a date for a second public hearing. The entire review process will take approximately 3-4 months.

For further information regarding the zoning amendment process, please contact the Department of Community Development at (269) 329-4477.

APPLICATION FOR ZONING AMENDMENT

Application number _____

Date 12/5/2022

APPLICATION INFORMATION:

Meetings of the Portage Planning Commission are held on the first and third Thursday of each month at 7:00 p.m. in the Council Chambers of Portage City Hall, 7900 South Westnedge Avenue, Portage, Michigan. All zoning amendment applications must be properly filled out and submitted to the Department of Community Development and the zoning amendment fee paid at least 15 working days prior to the meeting at which the public hearing is held. The applicant will be notified in writing of all such public hearing/meetings. *Please note: City Staff and/or Planning Commissioners may visit the subject property while the application is under review.*

For more detailed information about the zoning amendment process, please refer to Portage Land Development Regulations, Article 4, Division 8, Subdivision 2.

TO THE PLANNING COMMISSION:

I (WE), the undersigned, do hereby respectfully make application and petition the Portage Planning Commission to amend the Zoning Ordinance and/or change the Zoning Map as hereinafter requested. In support of this application, the following is submitted:

ZONING MAP AMENDMENT

1. a. Platted Land: See attached GIS Property Maps

The property is part of the recorded plat: The property sought to be rezoned is located at 412 W Centre Ave & 7860 Shaver Rd between Shaver Road Street and W Centre Ave Street on the _____ side of the street, and is known as Lot Number(s) _____ of _____ Plat (Subdivision). It has a frontage of _____ feet and a depth of _____ feet.

b. Unplatted Land:

The property is in acreage, and is not therefore a part of a recorded plat. The property sought to be rezoned is located and described as follows: (Indicate total acreage and parcel number).
412 W CENTRE AVE / Parcel ID 00016-740-E / 9.47 ACRES
7860 SHAVER RD / Parcel ID 06451-001-O / 1.50 ACRES

2. a. Do you own the property to be rezoned? Yes ___ No ___

b. Name of the owner of the property to be rezoned: PCL Curtis, LLC

Address 412 W. Centre Ave. Portage, Michigan 49024

3. My (our) interest in the property and purpose for submitting the proposed Zoning Amendment:
[Zoning Map Amendment to re-zone area currently zoned CPD to PD Planned Development](#)

4. CURRENT ZONING: [CPD](#) PROPOSED ZONING: [PD](#)

ZONING TEXT AMENDMENT

1. The proposed language to be considered is (attach additional sheets as necessary):
[Zoning Map Amendment](#)

2. The Zoning Code Chapter and Section wherein the proposed text would be modified/inserted.
[Zoning Map Amendment](#)

3. My (our) interest in and purpose for submitting the proposed Zoning Ordinance Amendment.
[Property re-zoning request](#)

We attach a statement hereto indicating why, in our opinion, the change requested is necessary for the preservation and enjoyment of substantial property rights, and why such amendment will advance the public health, safety and welfare. An assessment of the impact of the proposal on the community and property of other persons in the vicinity of the amendment or affected by the amendment is also attached.



(Signature of Applicant) **John McGraw, President** (Signature of Applicant)

River Caddis, Development, LLC. 1038 Trowbridge Road, East Lansing, MI 48823

(Address)

(Address)

Contact Information. John McGraw, jmcgraw@rivercaddis.com, 517.420.7393

(Phone)

(Phone)

A copy of all actions taken regarding this application shall be attached and shall be considered a part of this application.



Property Address

412 W CENTRE AVE
PORTAGE, MI, 49024

This Parcel has no
image on file.

Owner Address

PCL CURTIS, LLC
--
903 LAKEVIEW DR
PORTAGE, MI 49002

Unit:	10
Unit Name:	CITY OF PORTAGE

General Information for 2021 Tax Year

Parcel Number:	00016-740-E
Property Class:	201
Class Name:	201 COMMERCIAL IMPROVED
School Dist Code:	39140
School Dist Name:	PORTAGE
PRE 2020:	0%
PRE 2021:	0%

Assessed Value:	\$508,400
Taxable Value:	\$508,400
State Equalized Value:	\$508,400

Prev Year Info

Prev Year Info	MBOR Assessed	Final SEV	Final Taxable
2020	\$575,500	\$575,500	\$511,912
2019	\$565,300	\$565,300	\$502,368

Land Information

Acreage:	9.47
Zoning:	CPD

Tax Description

PART OF THE SE 1/4 OF SEC 16-3-11; COMM AT THE S 1/4 POST OF SAID SEC 16; TH N 89 DEG 58' 40" E 1493.62; TH S 00 DEG 01' 20" E 459.88 FT TO POB; TH N 00 DEG 00' 25" W 308 FT; TH N 24 DEG 37' 11" W 134.38 FT; TH N 17 DEG 48' 06" E 452.67 FT; TH S 89 DEG 55' 18" E 278 FT MORE OR LESS TO REFERENCE PT "A" AND THE CENTERLINE OF PORTAGE CREEK; TH SOUTHEASTERLY ON SD CENTERLINE 195 FT MORE OR LESS TO A POINT WHICH IS 189.62 FT S 49 DEG 9' 53" W OF SAID REFERENCE POINT A; TH S 65 DEG 35' 20" E OF 503 FT; TH S 24 DEG 18' 40" W 279.04 FT; TH N 65 DEG 35' 20" W 10.78 FT; S 24 DEG 31' 48 " W 309.29 FT TH N 65 DEG 33' 56" W 113.72 FT; TH S 64 DEG 11' 12" W 102.52 FT; TH S 89 DEG 58' 40" W 226.09 FT TO POB. 9.47 ACRES. SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

Sales Information

Sale Date: 06-28-2006

Sale Price: 1200000

Instrument: WD

Grantor: CITY OF PORTAGE

Grantee: PCL CURTIS, LLC

Terms of Sale: 21-NOT USED/OTHER

Liber/Page: 2006-029515

Sale Date: 02-04-2000

Sale Price: 74000

Instrument: WD

Grantor: NICOLA, ROBERT J & H M

Grantee: CITY OF PORTAGE

Terms of Sale: 03-ARM'S LENGTH

Liber/Page:

Sale Date: 07-02-1998

Sale Price: 15500

Instrument: WD

Grantor:

Grantee:

Terms of Sale: 03-ARM'S LENGTH

Liber/Page:

Sale Date: 12-01-1994

Sale Price: 74000

Instrument: WD

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1766-0690

Sale Date: 11-01-1993

Sale Price: 0

Instrument: LC

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1688-0834

Sale Date: 02-16-1993

Sale Price: 0

Instrument: WD

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1762-0296

Sale Date: 02-16-1993

Sale Price: 0

Instrument: LC

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1623-0030

Sale Date: 10-01-1992

Sale Price: 82000

Instrument: LC

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: UNRECORD

Sale Date: 11-12-1991

Sale Price: 0

Instrument: QC

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1529-0165

Sale Date: 10-01-1990

Sale Price: 0

Instrument: WD

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1838-0367

Sale Date: 10-01-1990

Sale Price: 73750

Instrument: WD

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1483-0373

Sale Date: 09-01-1990

Sale Price: 0

Instrument: QC

Grantor:

Grantee:

Terms of Sale: 33-TO BE DETERMINED

Liber/Page: 1483-0382

GIS/Mapping:

These maps are intended to be used for generalized citywide planning and there are no warranties that accompany this product. City of Portage recommends that users of this product confirm the data used in production of this map by visual inspection of the geographic area. In no event shall the City of Portage be liable to the user or any third party for errors, omission or positional accuracy of this product, regardless of the form of claim or action, whether in contract or tort, including negligence, in the amount that exceeds the sum paid by the user for the product. The City of Portage reserves all rights of authorship granted under U.S. and International copyright laws and agreements.



Property Address

7860 SHAVER RD

PORTAGE, MI, 49024

This Parcel has no
image on file.

Owner Address

PCL CURTIS, LLC

--

903 LAKEVIEW DR

PORTAGE, MI 49002

Unit:	10
Unit Name:	CITY OF PORTAGE

General Information for 2021 Tax Year

Parcel Number:	06451-001-O
Property Class:	202
Class Name:	202 COMMERCIAL VACANT
School Dist Code:	39140
School Dist Name:	PORTAGE
PRE 2020:	0%
PRE 2021:	0%

Assessed Value:	\$114,300
Taxable Value:	\$76,837
State Equalized Value:	\$114,300

Prev Year Info

Prev Year Info	MBOR Assessed	Final SEV	Final Taxable
2020	\$130,700	\$130,700	\$75,777
2019	\$130,700	\$130,700	\$74,365

Land Information

Acreage:	1.5
Zoning:	CPD

Tax Description

PORTAGE CREEK LANDINGS CITY CENTRE UNIT #1 SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

Sales Information

No Records Found

GIS/Mapping:

These maps are intended to be used for generalized citywide planning and there are no warranties that accompany this product. City of Portage recommends that users of this product confirm the data used in production of this map by visual inspection of the geographic area. In no event shall the City of Portage be liable to the user or any third party for errors, omission or positional accuracy of this product, regardless of the form of claim or action, whether in contract or tort, including negligence, in the amount that exceeds the sum paid by the user for the product. The City of Portage reserves all rights of authorship granted under U.S. and International copyright laws and agreements.



COMMERCIAL DEVELOPMENT APPLICATION

Department of Community Development
7900 South Westnedge Avenue – Portage, Michigan 49002 – (269) 329-4477

Applicant must complete all items in sections 1-9 (if applicable).

Please note: Separate applications must be submitted for Plumbing, Mechanical and Electrical Work Permits

No Work is to Start Prior to the Issuance of Building Permit

1) PROJECT INFORMATION

Project Description	PD Planned Development Refer to conceptual plans	Address	412 W Centre Ave 7860 Shave Avenue
---------------------	---	---------	---------------------------------------

2) IDENTIFICATION (OWNER)

Name	River Caddis Development, LLC	Address	1038 Trowbridge Road
City	East Lansing	State	Michigan
Zip	48823	Phone	517.420.7393

3) ARCHITECT OR ENGINEER

Name	Integrated Architecture	Address	840 Ottawa NW	City	Grand Rapids
State	Michigan	Zip	49503	Phone	616 574-0220
License Number		Expiration Date		Email	dhuizenga@intarch.com

4) BUILDING CONTRACTOR

Company name	TBD	Address		City	
State		Zip		Phone	
Email		Federal Employer ID			
Builder License Number		Expiration Date			
Workers Comp Insurance Carrier		MESC Employer Number			

5) TYPE OF DEVELOPMENT PROJECT

- ☐ Site Plan ☐ Building Plan ☐ Final Plan in Planned Development
☐ Subdivision ☐ Condominium ☐ Land Division Requiring Public Improvements
☐ Landscape Plans ☐ Public Water Main ☐ Public Sanitary Sewer Main

☒ Other: Tentative Plan in Planned Development

(Note: Please provide a Portable Document Format (PDF) of the plans for the project at time of document submittal. The submitted format shall be CD/DVD or USB. If a PDF is not submitted, an additional \$25 fee plus \$1 for each plan sheet after 20 sheets will apply.)

6) TYPE OF IMPROVEMENT

- ☒ New Buildings ☐ Alteration ☐ Addition ☐ Repair ☐ Demolition ☐ Foundation Only
☐ Relocation ☐ Special Inspection ☐ Solar ☒ Other: PD Planned Development

7) DESCRIPTION OF WORK

- A) Phase 1 Residential Development Component proposing (6) three story multi-residential apartment structures, (2) Two "Live Work" 3 story buildings, totaling 228 new apartment units. Phase 1 Planned Developments also include club house amenity building including pool and site developments such as parking and storm water management facilities.

B) Valuation of Project: \$ 31 Million

8) CHARACTERISTICS OF THE BUILDING

A) Water Meter Size **TBD**

- ☐ 5/8" ☐ 3/4" ☐ 1" ☒ 1 1/2"
☐ Other _____ ☐ Irrigation Size _____ ☐ Fire Sprinkler Size _____

B) Electric Service Size **TBD**

- ☐ 200 AMP ☐ 400 AMP ☐ 600 AMP ☐ 800 AMP ☒ 1000 AMP ☐ Other **TBD**

C) Type of Mechanical

Air Conditioning? ☒ Yes ☐ No Fire Suppression? ☒ Yes ☐ No Hood System? ☐ Yes ☐ No

9) CONSTRUCTION PLANS SUBMITTED

Required submittals for plan review:

- Plans shall be signed and sealed when required in accordance with State of Michigan Act No.299 of Public Acts of 1980.
- All plans shall be drawn on uniform sheets no greater than 30"X42".
- All plans shall be drawn to an architectural scale.
- All plans shall be clear, legible and accurate.
- Plans shall be stapled along the left margin.

Type of Plan Submitted:

☒ Building ☐ Electrical ☐ Plumbing ☐ Mechanical ☐ Energy

Building Code: Site plan, foundation plan, soil bearing capacity, floor plans, building elevations, building sections, framing plan, details, roof plan, roof finish schedule, roof live and dead loads.

Electric Code: Lighting layout, circuiting, switching, conductor and raceway sizes, wattage schedule, service location and riser diagram, load calculations, and appropriate plans showing standard symbols of all electrical equipment.

Plumbing Code: Site plan, floor plans, DWV riser diagrams and water distribution system and roof plan, Show direction of flow, pipe sizes, grade of horizontal piping, elevations, drainage fixture unit loading of both stacks and drains in the DWV system, supply fixture unit load for the water system, branch supplies serving more than one plumbing fixture, appliance or hose outlet, meter locations.

Mechanical Code: Plans indicating heating equipment, air conditioning equipment, ductwork material and layout, fire dampers, ventilation of rooms and areas, location of chimneys and vents, piping layouts, kitchen equipment layout, and combustion air. (Plans for fire suppression systems may be submitted after permit issuance, but are required prior to installation.)

Energy Code: Floor plans, building sections, details, average annual degree days, exterior envelope components materials, "U" values of elements, "R" values of insulating materials, size and type of apparatus and equipment, energy calculations.

Note: Additional plan review fee(s) required of all non-concurrent plan submittals

APPLICANT INFORMATION

Applicant is responsible for the payment of all fees and charges applicable to this application and must provide the following information:

Name River Caddis Development, LLC	Phone 517.420.7393
Address 1038 Trowbridge Road	City East Lansing
State Michigan	Zip 48823

I hereby certify that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his/her authorized agent, and I agree to conform to all applicable laws of the State of Michigan and ordinances of the City of Portage. All information submitted on the application is accurate to the best of my knowledge.

Signature of Applicant:  Date: _____

FOR DEPARTMENTAL USE ONLY

- | | | |
|---|--|--|
| ☐ Vacant | ☐ F-2: Factory (Low Hazard) | ☐ I-4: Institutional (Day Cares, ETC.) |
| ☐ A-1: Assembly (Theaters) | ☐ H-1: High Hazard (Detonation) | ☐ M: Mercantile |
| ☐ A-2: Assembly (Restaurants) | ☐ H-2: High Hazard (Deflagration) | ☐ R-1: Residential (Hotels, Motels, ETC.) |
| ☐ A-3: Assembly (Library, ETC.) | ☐ H-3: High Hazard (Physical) | ☐ R-2: Residential (Multi Family, ETC.) |
| ☐ A-4: Assembly (Indoor Sports) | ☐ H-4: High Hazard (Health) | ☐ R-3: Residential (1 & 2 Fam. Townhomes) |
| ☐ A-5: Assembly (Outdoor Sports) | ☐ H-5: High Hazard (HPM) | ☐ R-4: Residential (Assisted living) |
| ☐ B: Business | ☐ I-1: Institutional (Supervised) | ☐ S-1: Storage (Moderate hazard) |
| ☐ E: Educational | ☐ I-2: Institutional (Hospital) | ☐ S-2: Storage (Low hazard) |
| ☐ F-1: Factory (Moderate hazard) | ☐ I-3: institutional (Prisons) | ☐ U: Utility (Garage, Shed) |

CHARACTERISTICS OF BUILDING

Frame:

- ☐ Masonry
 ☒ Wood Frame
 ☐ Structural Steel
 ☐ Reinforced Concrete
 ☐ Other

Heating System:

- ☒ Gas
 ☒ Electricity
 ☐ Solar
 ☐ Other _____

New Sewer Connection:

- ☒ Yes
 ☐ No

New Water Connection:

- ☒ Yes
 ☐ No

Type of Mechanical:

- Y ☐ (Y) Air Conditioning
 Y ☐ (Y) Fire Suppression

DIMENSIONS / DATA

Number of Stories 3 story
 Use groups Residential
 Construction Type 5

Number of Occupants _____

Floor Area	Existing	Alterations	New
Basement			
1 st Floor			3,500 sf - 10,965 sf
2 nd Floor			3,925 sf - 10,965 sf
3 rd Floor			3,925 sf - 10,965 sf
4 th Floor			
5 th Floor			
Total			212,165 sf

See C200 Site Plan for Proposed Building(s) and footprints

See architectural site plan for building areas.



**RIVER CADDIS
MULTI-FAMILY DEVELOPMENT**

PORTAGE, MI
PLANNED DEVELOPMENT SUBMITTAL
FOR APPROVAL OF TENTATIVE PLAN
5 DECEMBER 2022

TABLE OF CONTENTS

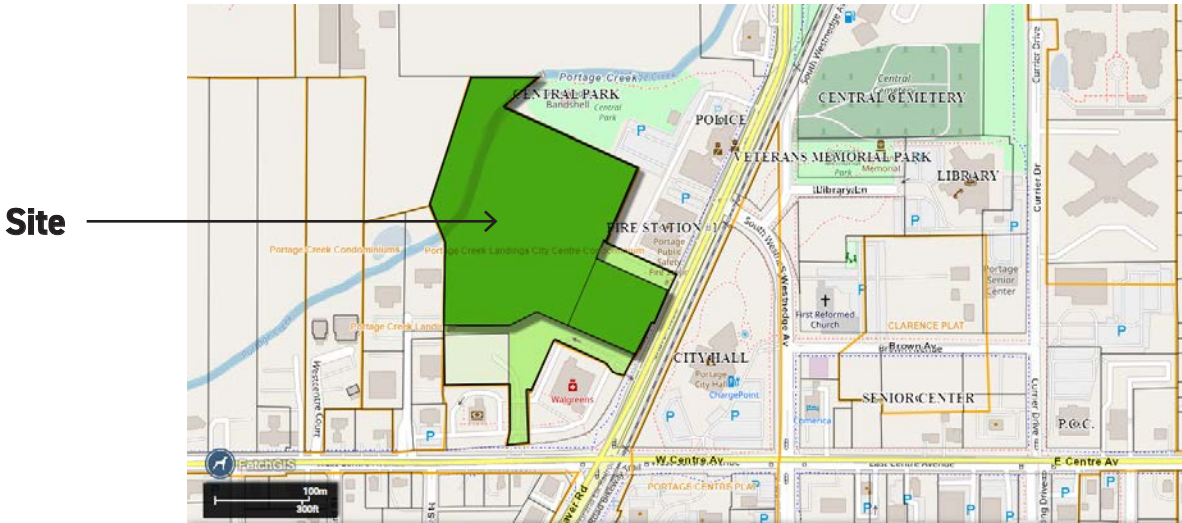
PROJECT NARRATIVE.....	2
STATEMENT OF OBJECTIVES.....	2
DESIGN INTRODUCTION.....	2
SITE AND CONTEXT.....	2
BUILDING ORGANIZATION AND SIZE.....	3
UNIT TYPES.....	3
EXTERIOR DESIGN.....	3
LANDSCAPING AND COMMON OPEN SPACE.....	3
SETBACKS AND BUILDING HEIGHTS.....	3
PARKING, TRAFFIC, AND TRANSIT.....	3
UTILITIES.....	4
TIMELINE	4
FINANCIAL	5
ARCHITECTURAL SITE PLAN.....	6-7
CIVIL SITE PLAN - SMALL SCALE (ATTACHED FULL SCALE)	8
EXTERIOR RENDERINGS.....	9, 10, 11





Statement of Objectives

On behalf of River Caddis Development, an experienced multi disciplinary Lansing based development company, we are excited to present to the City of Portage our concept for a new, high quality residential development at West Centre Avenue and Shaver Road within the Portage Creek Landing City Centre Condominium. We are seeking a rezone to PD for parcel numbers 00016-740-E and 06451-001-0, and submitting for tentative PD approval.



Design Introduction

We are proposing a high quality, market-rate community, focused on providing a variety of rental living options in the neighborhood of Central Park and City Hall. The project will include two building types providing live/work units and stacked flats. The Live/work buildings offer public storefronts and parking facing Shaver Road, and back porch residential access from the west. Stacked upper-level flats are offered on levels 2 and 3. The three level stacked flats buildings on the interior of the site offer one and two bedroom units of various sizes and price points.

Tree-lined boulevard entry drives off West Centre Avenue and Shaver Road lead residents and guests past the community center and around the central green and recreation areas through the site to each of the main building entries. The community center and green includes a resident pool and terrace, park, fire pits, and pickle ball courts. As the neighborhood's social hub, this will become a favorite indoor and outdoor hang out for programed activities, walking dogs, connecting to the trails, and meeting neighbors.

The project site is centrally located with walkable access to Central Park, the Portage District Library, schools, childcare facilities, the Portage Zhang Senior Center, the Portage Community Outreach Center, retailers, restaurants, and the Portage Creek Bicentennial Park Trail for walking, jogging or biking.

With a live/work transitional commercial public side, and an interior of residential stacked flats, this development offers its residents and the City of Portage the elements to become a strong residential community.

Some key qualities of successful residential communities we are targeting with this project include:

1. Sense of Community/Sense of Place – intentionally creating a strong architectural presence and establishing a central social hub on the property supporting a unique and desirable living experience.
2. Connections/Paths – internal movements of both pedestrians and of vehicles have been choreographed to optimize visibility and efficiency.
3. Great Accommodations, amenities, and accessibility- A central location, cohesive architecture with quality materials, and connected pathways supporting active lifestyles today and into the future.

Site and Context

The site is the approximately 10.6 acre vacant subdivision of Portage Creek Landings City Centre Condominium. It is accessed from W Center Ave to the south and fronts Shaver Road to the east.

The property is zoned CPD - Commercial Planned Development. The parcel abuts properties zoned OS-1 Office Service District and RM-2 Multifamily Residential to the west, OS-1 and RM-2 to the north, OS-1 to the east, and CPD to the south. Two portions of the parcel provide pedestrian and vehicular access from the south and east.



Building Organization, Size and Heights

9 buildings are placed on the site to optimize their relationships with the surrounding context and create a series of inviting dwellings and amenity areas.

Buildings 1 and 2 are three stories at thirty eight feet in height at the parapet of the flat roof. Each include ground level live/work units and stacked flats on the upper two levels. These buildings front Shaver Road and include parking adjacent to the store fronts facing east. Buildings 1 and 2 will each have 4 live/work and 8 stacked flat units. All units in the development will have in-unit laundry.

Buildings 3 - 8 include 3 levels of stacked flats accessed by multiple entry points in each building. These buildings are three stories at forty five feet in height to the highest peak of the hip roofs. Buildings 3-7 have 36 one and two-bedroom units and three primary entrances. Building 8 has 24 one bedroom units and two primary entrances.

Building 9 houses the community room, common spaces, and a leasing office. The single story structure is twenty four feet in height to the peak of the hip roof.

With 228 units on 10.61 acres of land, the development will total 21.5 units/acre, exceeding the 7 units/acre allowable for the PD district. This density allows the development to offer a variety of unit types at accessible rent rates in this desirable centralized location. This density will also help address the “mismatch” between available rental properties and demand for rental properties that is outlined in the 2020 City of Portage Residential Market Analysis. The project will offer desirable, high quality one and two-bedroom flats, as well as live/work units with independent, exterior doors and decks.

This parcel is well situated to accommodate higher density ratios, within walking distance of nearby businesses and public resources. The majority of the site is an interior parcel abutting natural buffer space of Central Park to the north and commercial and public service uses to the west, south and east.

Unit Types

The development will offer live/work units and stacked flat apartments as residential options. The stacked flats will include several sizes of one and two bedroom units allowing for a range of rental rates.

Exterior Design

The project’s architectural aesthetic is clean and refined, with a horizontal emphasis for the stacked flats, and modern commercial facade for the live/work buildings. The material palette will include neutral tones of brick, decorative masonry, and pre-finished composite siding.

Large windows, and accents of darker tones will provide texture, visual interest and character.



Landscaping and Common Open Space

Landscaping across the site will create an inviting outdoor experience. Tree-lined entry boulevards will enhance the arrival experience. Sidewalks at the residential buildings and around the common green establish internal connections and access to the public park and trail system. Pickleball courts, outdoor fire pits, a swimming pool and terrace complete the social and recreational amenities at the community building. All common open space, walks, drives, and parking areas will be well-maintained by the complex.

The exterior “front yards” and entryway sequences will also receive attractive landscaping and trees. The forms and locations of the buildings act as visual buffers between the street sightlines and parking areas and will be supplemented with shrubs and other plantings where necessary. Four trash and recycle enclosures will be conveniently positioned with proper architectural and landscape screening.

Setbacks

Buildings 1 and 2 have 80’ front setbacks from Shaver Road to the east, and side yard setbacks of 42’ and 30’ respectively. Building 3 has a south side yard setback of 5’ to the internal property line defining the roadway access parcel, 75’ to parcel 00016-765-B (Walgreen’s). Building 3 is setback 95’, 130’, and 150’ from buildings 9, 8, and 2. Buildings 4,5,6 and 7 have side and rear setbacks between 30’ and 300’. Building 8 has a 25’ rear setback abutting the public safety and fire department parcels. Building 9, the community building, has a side yard setback of 65’ and 90’, and is 95’ to the nearest adjacent buildings. Please reference the schematic site plan for additional setback information.

Parking, Traffic, and Transit

The site will be accessed from W Centre Ave to the south, and Shaver Road to the east. One additional right-in/ right-out Shaver Road access is located south of the fire department parcel 375’ from the W Centre Ave entry road as measured at the property line. (second remote fire access road based on IFC D106.3). The longest diagonal drawn across the site of the area to be served by the fire department is approximately 740’ SE to NW. Concerns with traffic moving north from parcel 06451-001-0 through the west side of the fire department parcel to access the intersection with a traffic light could be addressed with do-not-enter signage facing south, or other solution acceptable to the fire department. A traffic study will be completed February 1, 2023.

continued

Parking, Traffic, and Transit - continued

The project provides a total of 359 surface parking spaces on the site, 15 of these spaces are dedicated to the commercial component of the live/work units (3000 usable sf/ 200= 15 space required). These 344 residential + 15 retail parking spaces equate to a ratio of 1.51 parking spaces per unit, which is at our typical design target of 1.5 spaces per unit. Our experience has indicated that this ratio sufficiently serves the number of 1 BR units and 2 BR units provided in the development. Additionally, this ratio balances the provision of adequate parking with our desire to maximize green space.

Transit needs can also be supplemented with convenient access to the bus system at the W Centre Ave and Shaver Road transit stop, line 26, off the south entry drive.

Utilities

Paved or concrete parking areas and drive aisles will direct storm water run-off to the on-site private storm sewer drains and storm sewer piping. Storm water run-off will be disposed of by a combination of storm water treatment and infiltration. A private storm water management system will be constructed in accordance with the Storm Water Design Criteria Manual, including Addendum No. 1 to the Storm Water Design Criteria Manual. Design of the system is pending, and the design will be subject to City review and approval.

If required, new fire hydrants will be installed on-site at locations approved by the City of Portage. These fire hydrants would be served by public water mains which would be designed and installed in accordance with City requirements, and appropriate easements would be granted to the City. It is anticipated that each building will be served by a six inch private sanitary sewer lead, draining to the City's public sanitary sewer system.

The site will be served with underground natural gas, electric, telephone, and/or cable TV lines and design of these utilities will be completed in the future by each private utility company.

Utilities - continued

The existing City drain that discharges onto the development property will be directed to a new premanufactured treatment structure for storm water quality improvements and then enclosed in a 36" public storm sewer and conveyed to Portage Creek. The existing City drainage ditch across the property will be filled following the public storm sewer installation. City and EGLE review and permitting shall be obtained as part of the PD final plan and public utility plan review processes.

This development is expected to encroach into the 100-yr floodplain along Portage Creek. Fill and, if necessary, compensatory cut volumes will be calculated with the project design and State of Michigan EGLE permitting will be obtained as part of the PD final plan process.

The development is also anticipated to encroach into the regulated wetlands adjacent to Portage Creek. Most of these wetland impacts are due to the existing City drainage ditch fill operation. Permits for this work will be obtained from EGLE. As part of this process, the developer intends to purchase wetland credits from an approved wetland bank to offset the wetland impacts.

Timeline

- After/ parallel with entitlements, we will see the following schedule-
- BRA and CRA 3 months parallel with entitlements
 - MEDC Approval 6 - 9 months
 - Construction documents 3-6 months
 - Estimated construction start Fall 2023/ Spring 2024 (depending on entitlements)

Staged construction with Live/work units, community building, and some stacked flats buildings beginning first, with additional stacked flats buildings added as units are required.



Financial



December 5, 2022

Pat McGinnis
City Of Portage
7900 S. Westnedge Ave.
Portage, MI 49002

Dear Mr. McGinnis:

I am pleased to provide a letter of reference for River Caddis in regard to a RFQ for City of Portage. River Caddis has been a client of First National Bank of Michigan for several years. We have financed many projects for this group and all transactions have been handled in an excellent manner. We consider them to be on our list of top clients. They provide information in a timely manner and have always followed through on all transactions and agreements.

The owners of River Caddis have high integrity and are financially strong borrowers. We welcome opportunities to do additional business with them.

Sincerely,

Patricia Barnas
Patricia Barnas
Market President, Lansing



101 S. Washington Square, Suite 100
Lansing, MI 48933
Fax 517-574-4160
Direct 517.318.3344
Cell 517.897.2611
www.fnbmichigan.bank

fnbmichigan.com

<i>Downtown Kalamazoo</i> 348 W. Michigan Ave. Kalamazoo, MI 49007 269.349.0100	<i>Portage</i> 2700 W. Centre Ave. Portage, MI 49024 269.488.0290	<i>West Kalamazoo</i> 5313 W. Main St. Kalamazoo, MI 49009 269.250.8860	<i>Grand Rapids</i> 141 Ionia Ave. NW, Ste. 1 Grand Rapids, MI 49503 616.242.6500	<i>Holland</i> 1 West 8 th St. Holland, MI 49423 616.251.1200	<i>Lansing</i> 101 S. Washington Sq., Ste. 100 Lansing, MI 48933 517.319.8000	<i>Traverse City</i> Northern Michigan Loan Production Office
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	BLDG 36(5)	BLDG 24(1)	WK/LV (2)	TOTAL	NOTES
WORK/LIVE	-	-	8	-	8 980 SF
1 BR UNIT	24	24	8	-	152 3 SIZES
2 BR UNIT	12	0	8	-	68
	-	-	-	-	-
TOTAL	180	24	24	-	228 ESTIMATED

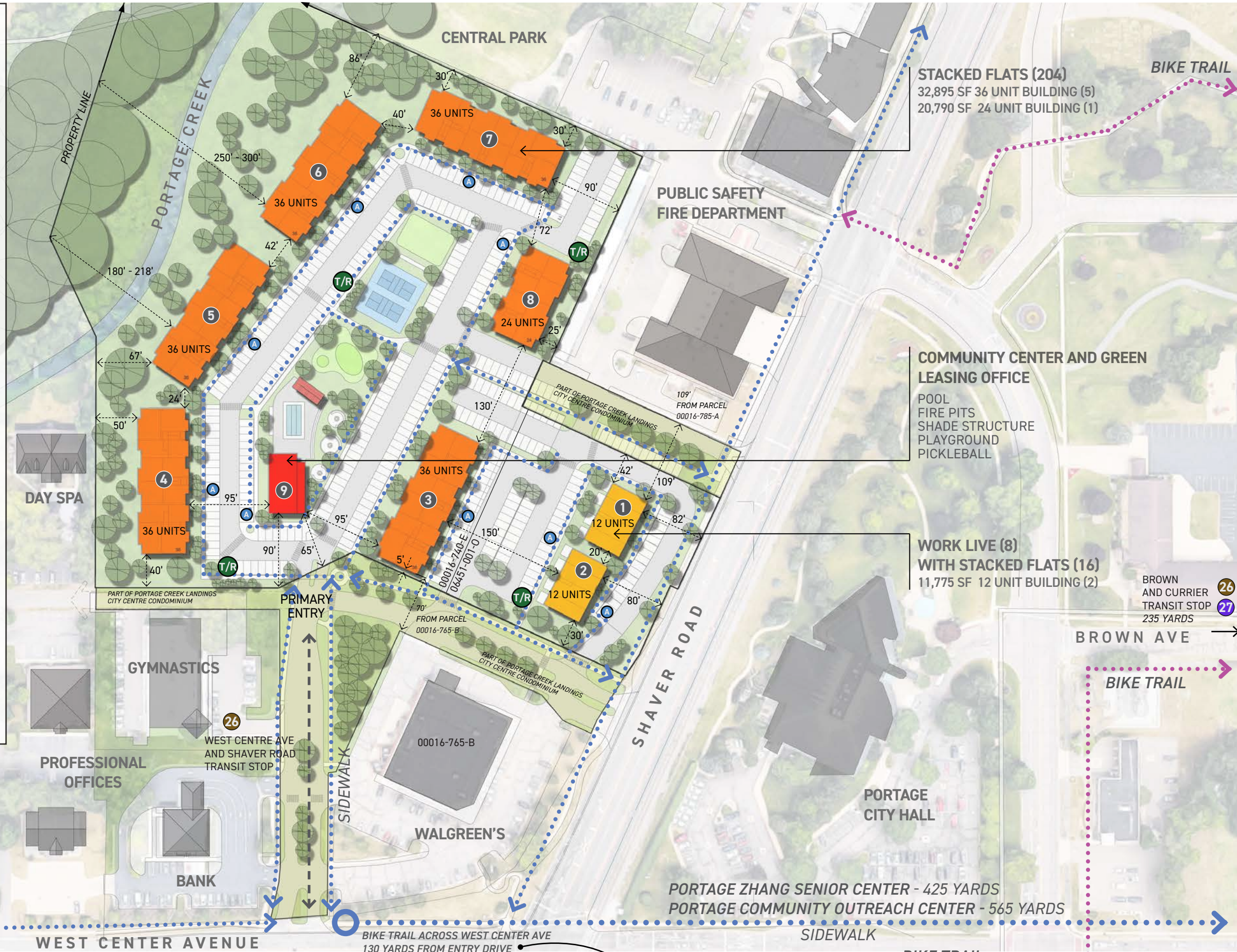
(2) WORK/LIVE	11,775 SF	23,550 SF
(5) BUILDING 36	32,895 SF	164,475 SF
(1) BUILDING 24	20,790 SF	20,790 SF
COMMUNITY BUILDING	3,350 SF	3,350 SF
TOTAL GSF		212,165 GSF

PARKING | 359 SPACES (9 ACCESSIBLE SPACES, 8 REQUIRED)
1.57 SPACES/UNIT - ESTIMATED

SITE AREA | ~462,170 SF

RESIDENTIAL UNIT DENSITY | 228 UNITS
~10.61 ACRES
21.5 UNITS/ACRE

- ACCESSIBLE PARKING SPACE
- TRASH/RECYCLE ENCLOSURE
- SIDEWALK - INTERNAL
- SIDEWALK
- BIKE PATH
- KALAMAZOO METRO TRANSIT
BROWN AND CURRIER TRANSIT STOP
WEST CENTRE AVE AND SHAVER ROAD TRANSIT STOP
- SETBACK



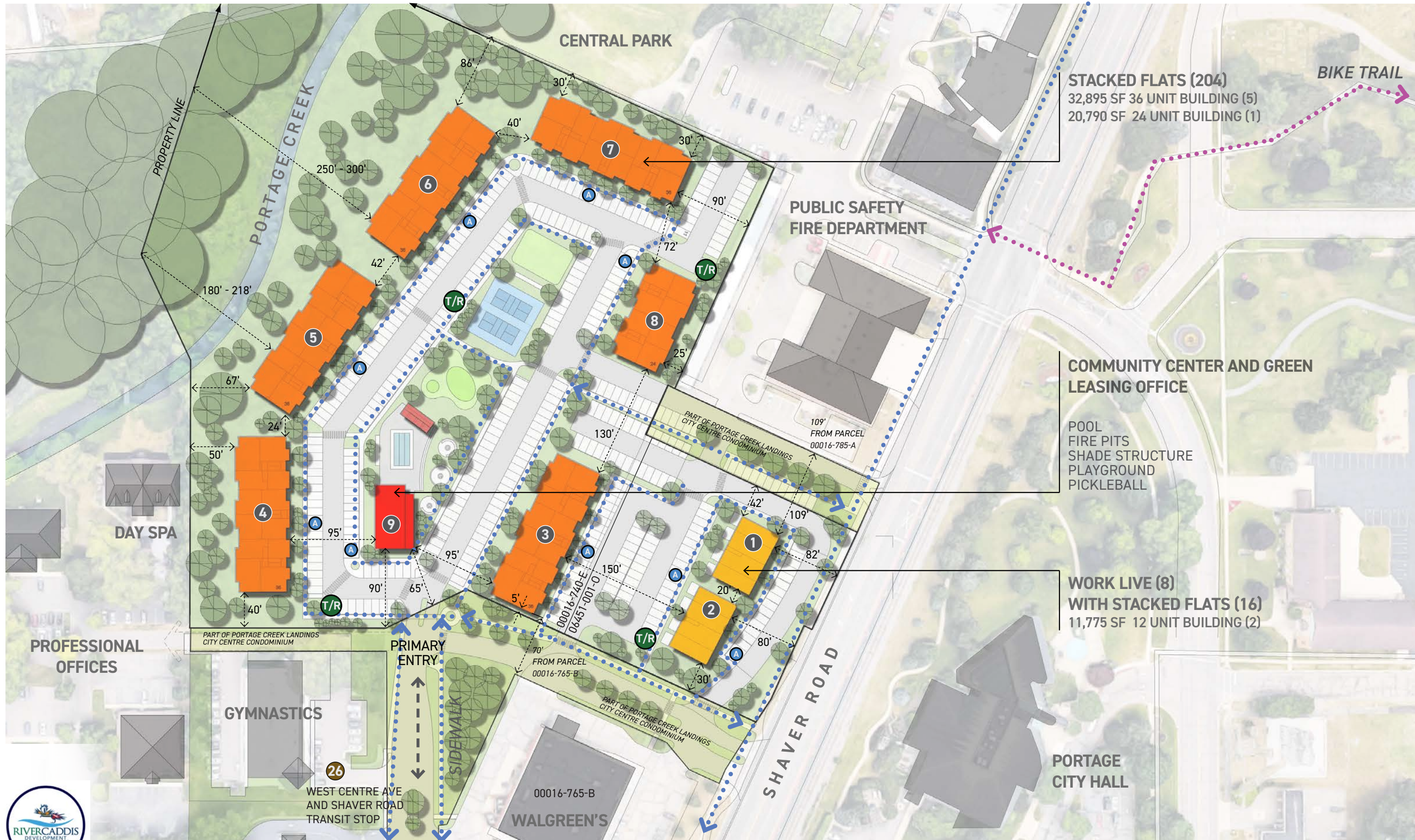
SITE PLAN | SCHEMATIC DESIGN - SCALE 1" = 120'



RIVER CADDIS MULTI-FAMILY DEVELOPMENT | PD APPLICATION

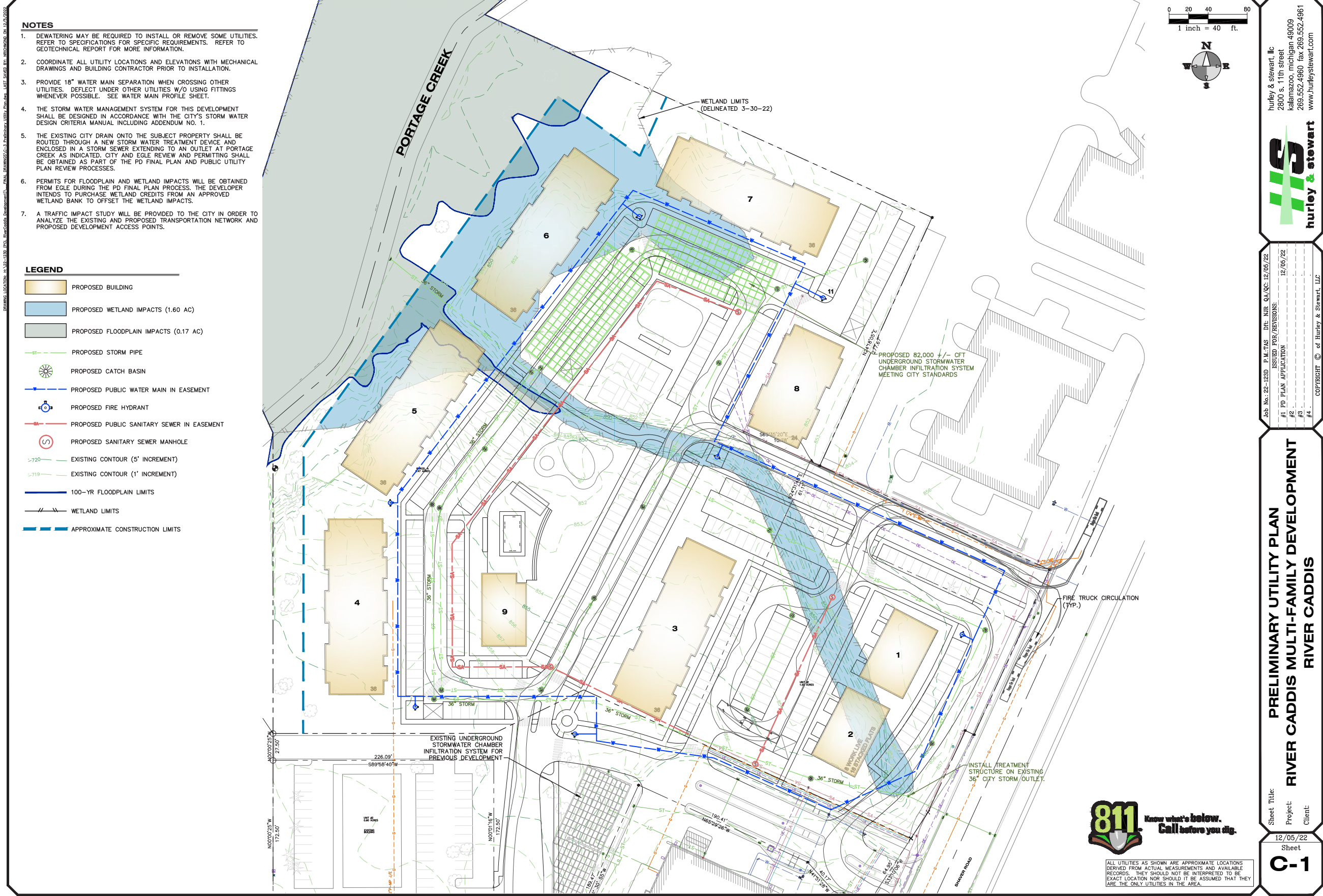
12 5 2022
20221002

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SITE PLAN | SCHEMATIC DESIGN - SCALE 1" = 100'



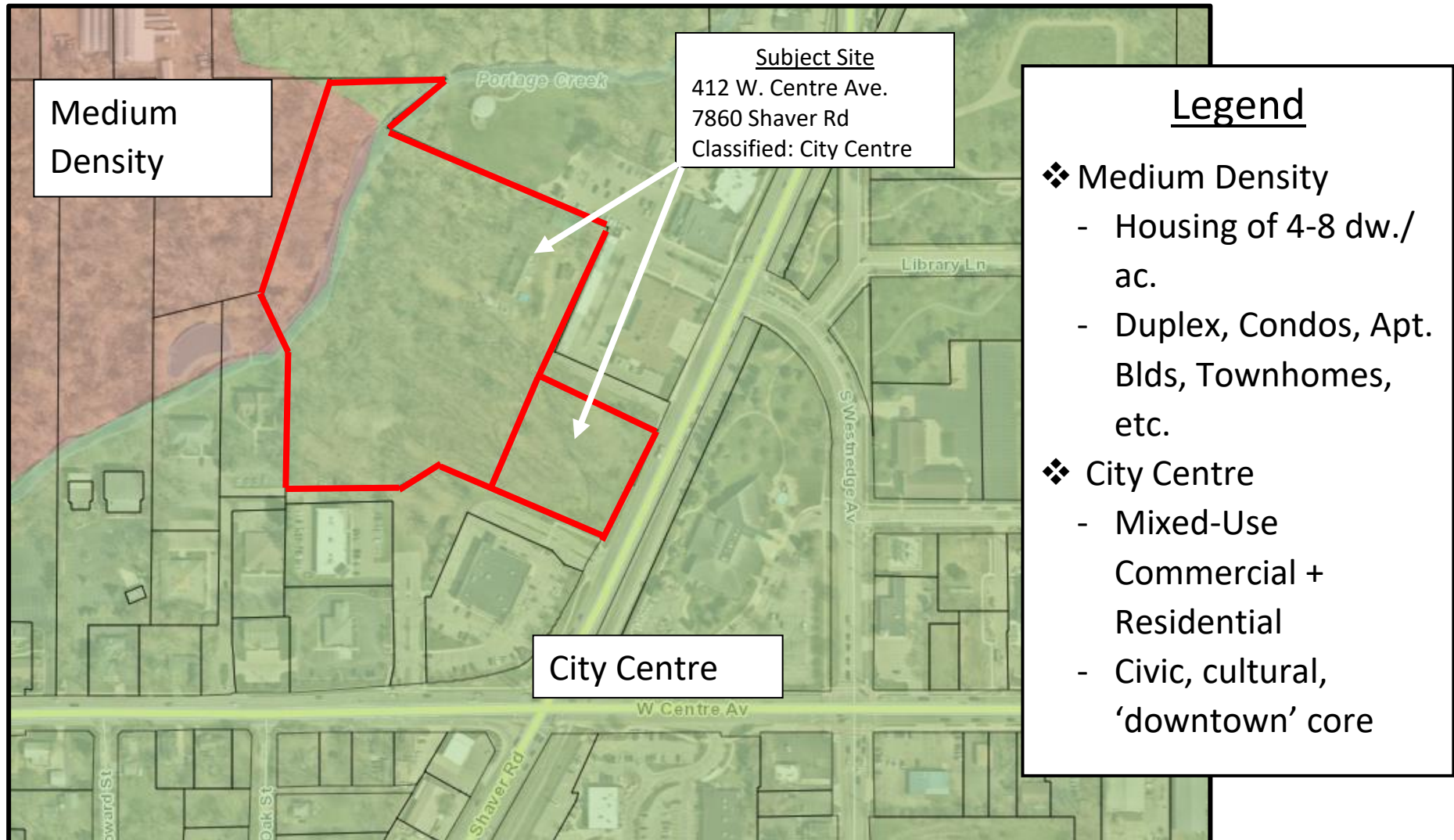








City of Portage Comprehensive Plan – Future Land Use Map

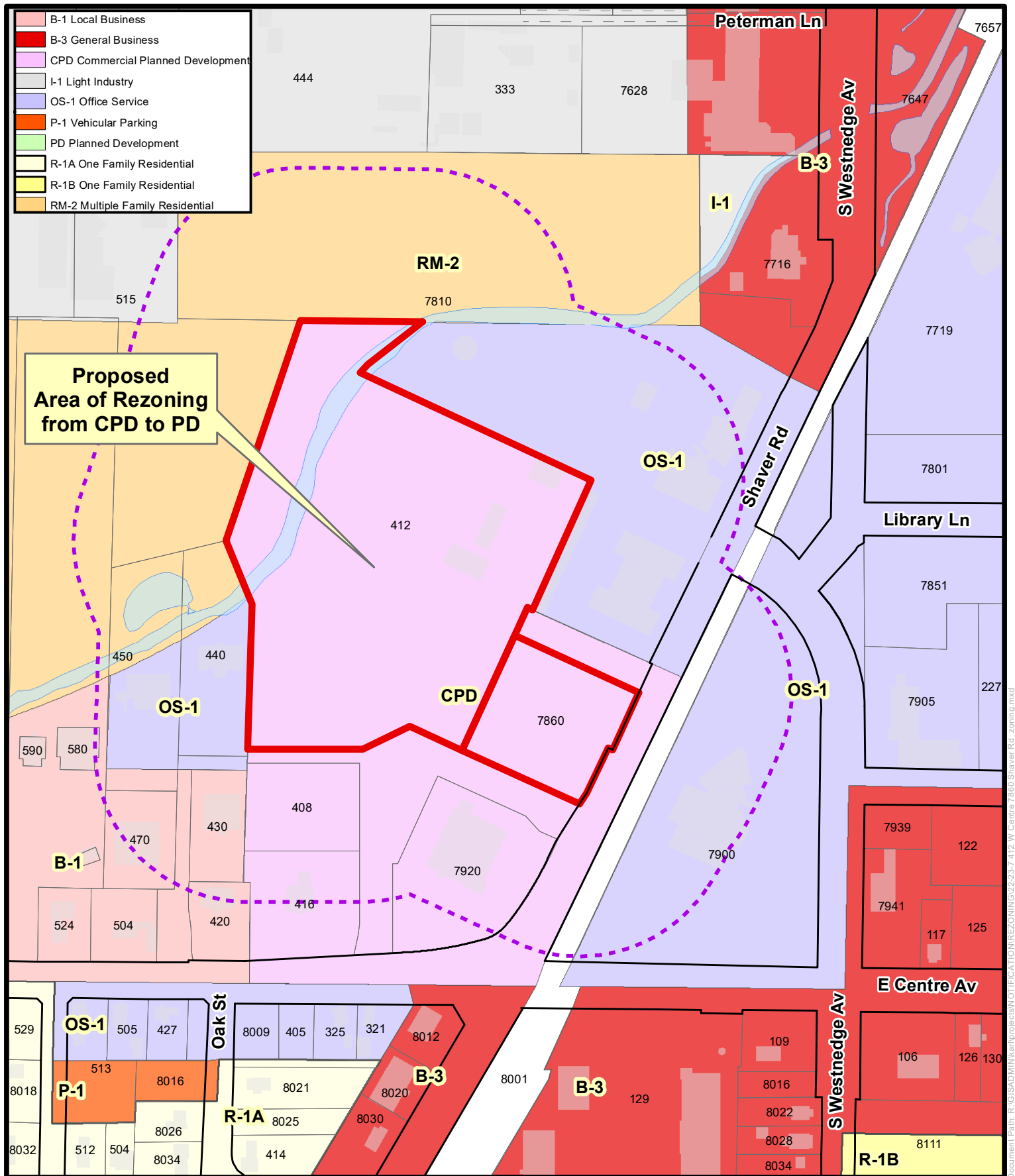




**Aerial Photography
Rezoning: 22/23 - 7
412 West Centre Ave, 7860 Shaver Road**



1 inch = 300 feet
Date: 12/29/2022



Notification Map **Rezoning: 22/23 - 7** **412 West Centre Ave, 7860 Shaver Road**

Document Path: R:\GISADMIN\karl\projects\NOTIFICATION\REZONING\22-23-7 412 W Centre 7860 Shaver Rd_zoning.mxd



10 January 2023

City of Portage
Ms. Kelly Peterson
Director of Community Development
7900 South Westnedge Avenue
Portage, MI 49002

RE: Planned Development (PD) Tentative Plan Review for River Caddis, 412 W. Centre Ave. and 7860 Shaver Road, Portage, MI

Dear Ms. Peterson,

On behalf of River Caddis Development and in response to your correspondence date 06 January 2023 with comments related to our PD Tentative plan review application, we are submitting the following:

City Comments (per 06 January 2023 letter)

Community Development

1. *Parking is shown within the parcel (owned by Portage Creek Landings City Centre Condominium) abutting Fire Station. Is this allowed?*

Our Response: We are showing both access / egress as well as parking in the common parcel owned by Portage Creek Landings City Centre Condominium (PCLCCC) adjacent to the fire station. We understand that the access / egress rights are allowed and are in the process of confirming the ability to also locate parking in this common parcel. We are awaiting this confirmation by PCLCCC and expect to have this clarified by the Planning Commission meeting on 19 January. As a contingency, we have indicated on the attached pages 6a, 6b, 7a, and 7b (which replace pages 6 and 7 from the original application) an area that could accommodate additional parking in the event that some or all of the parking shown in the common parcel is not allowed.

2. *Please provide a consent letter/ formal permission from existing landowners 1) PCL Curtis LLC) and 2) Portage Creek Landings City Centre Condominium to use their properties for the development project.*

Our Response: River Caddis currently has an active purchase agreement in place with PCL Curtis LLC and have informed them of our PD tentative plan review process. A consent letter from PCL Curtis, LLC is attached and confirmation of the rights to the common parcel will be provided to the city by noon on Thursday, 12 January.

3. *Per Sec. 42-374(E)(b), a 30-foot setback between buildings is required. This is not currently met.*

Our Response: This requirement is met in all cases except between Buildings (4) and (5), and (1) and (2). The attached revised pages show that we will shift Building (5) northward to maintain compliance. We request, however, due to the more commercial nature of Buildings (1) and (2), that the 20 foot set-back be considered. We feel this represents a more appropriate relationship in this commercial / mixed use setting.

4. *The proposed density is 21.5 dwelling units / acre, which exceeds the maximum density of 7 units/ acre allowed within Sect. 42-374(D). Planning Commission and City Council have, however, previously approved densities higher than 7 units/acre. Please provide a written narrative describing in detail how the existing/ proposed utilities, parking, and adjacent streets will be able to accommodate the demand of the proposed density.*

Our Response: River Caddis has identified an opportunity to bring highly desirable, market rate housing into the City of Portage, based on a number of factors, including the data contained in the "Residential Market Analysis" prepared by LandUse USA for the City in 2020 that identified an annual market need (absorption) of up to 2969 units in the Portage area. This is clear evidence of the need, and in this particular site; one that is supported well with services within walking as well as public transportation, an ideal setting for increased density.

While we are exceeding the (7) unit/acre maximum, proper design and scaled architecture provides ample greenspace and amenities to support the density proposed. It also creates a strong sense of community and establishes a "neighborhood" of sorts that will be an attractive living option in the City.

5. *The parking requirement for 228 housing units is 456 spaces (2.0 spaces/ unit) per Sect. 42- 523 'Residential and Multi-family Residences'. The project proposes 344 spaces (ratio of 1.5 spaces/ unit), which is 112 spaces less than what is required by current code. The Planning Commission may approve a reduction in the parking requirement per criteria listed under per Sect. 42-520(O). Please provide a written narrative describing in detail how the proposed number of parking spaces will appropriately accommodate the development.*

Our Response: River Caddis has extensive recent experience with multi-family developments and in particular, those developments in a setting such as this that are well served with adjacent services, amenities, walking network and public transportation. These types of conditions have confirmed a parking need in the 1.00 to 1.40 vehicle spaces per unit, well below the 2.0 spaces required in section 42-523. Section 42-520(o) allows a 25% reduction (in our case allowing a reduction of up to 114 spaces) for a number of factors including pedestrian connectivity to adjacent services, proximity to public transportation and other factors.

Our site has great pedestrian connectivity as highlighted in the attached revised pages six (site plan), has a transit stop at West Centre Ave., will have ample on-site bike storage and bike repair stations as well as contain a higher percentage of one bedroom units. River Caddis is also conscious of the need to provide adequate parking and is confident that a reduction of spaces and a target above 1.4 spaces per unit is absolutely sufficient. In addition, this allows for increased greenspace and resident amenities.

Engineering & Utilities

City comments 1., 2., and 3., related to both traffic and supportive utility issues. Traffic data is currently being analyzed and will be completed prior to our 19 January meeting. In addition the site is well served by existing utilities to support the proposed development including water, sanitary and storm utilities as preliminarily referenced on page 8 of our PUD application. As it relates specifically to the storm sewer situation, ideally the intent is to serve the development with gravity flow by way of on-site modifications (including grading manipulations and fill import). However, if this is determined not to be feasible, other means will be identified to provide a system that meets the City's and Michigan EGLE requirements.

Thank you again for your assistance in processing this application. We are excited to share more of our story and to have continued dialogue with the City on the 19th! Please let me know if you have any questions or are in need of any further information.

Very truly yours,



Michael C. Corby, FAIA, NCARB, LEED AP
President /Managing Partner

INTEGRATED ARCHITECTURE

Cc: Mr. Eric Feldt – City of Portage
Mr. John McGraw - River Caddis Development

ATTACHMENTS:

1. Consent letter
2. Site Plan A page 6a
3. Site Plan B page 6b
4. Site Plan A page 7a
5. Site Plan B page 7b



PCL Curtis, LLC

450 West Centre Avenue Portage, Michigan 49024

January 10, 2023

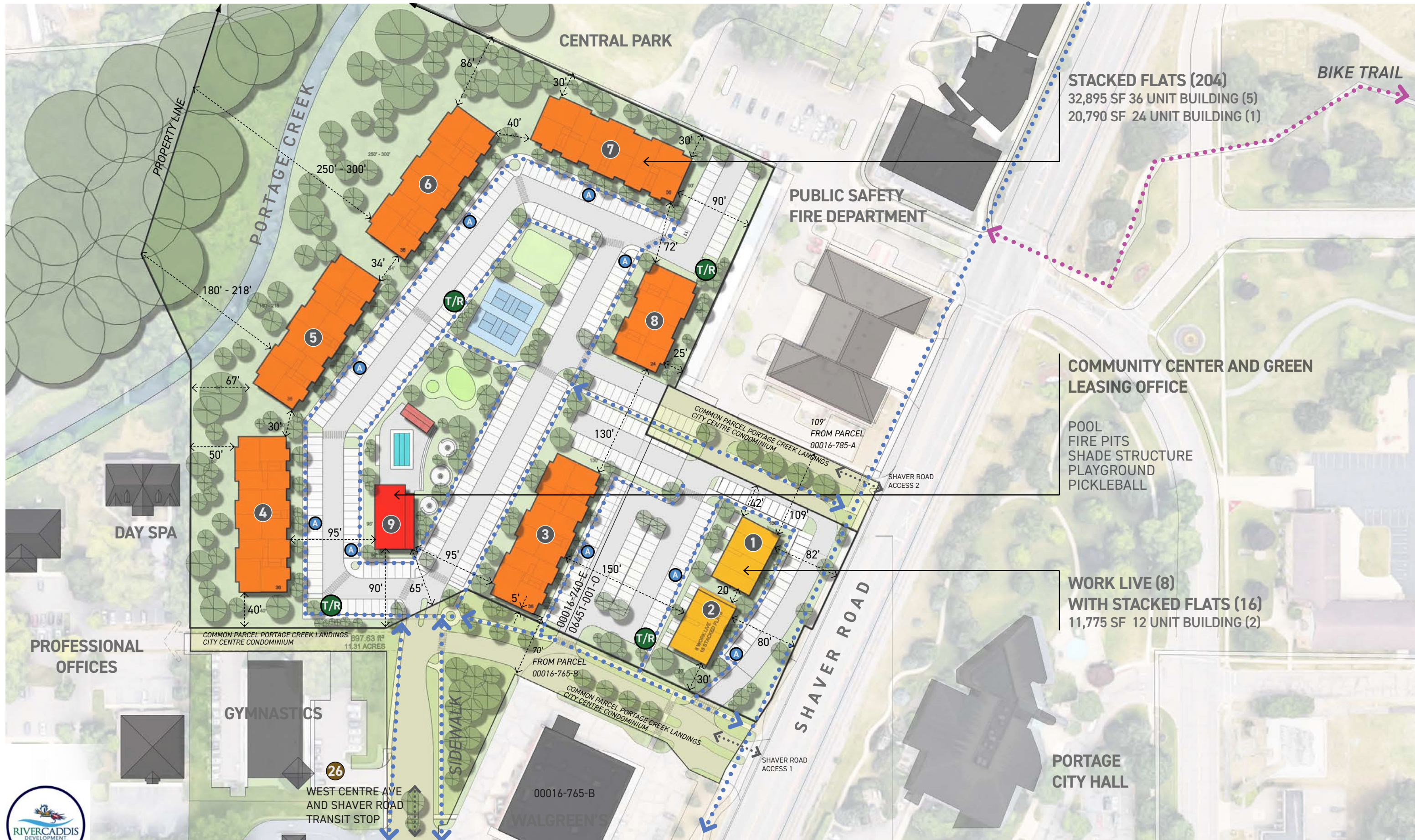
Eric Feldt, AICP, CFM
City Planner | Project Manager
Department of Community Development
City of Portage, MI
Ph: (269) 329-4471

Dear Mr. Feldt,

PCL Curtis, LLC ("Owner") approves and consent to River Caddis Development, LLC ("RCD") pursuing a Planned Development ("PD") with their most recent submitted plan to the City of Portage. Further, we are investigating the potential available parking in the access ways through the PCL Curtis Condo Association, and may pursue an amendment to the Condominium Documentation if this is the most suitable option.

Sincerely,

Michael A. Marshburn
Manager
PCL Curtis, LLC
mam

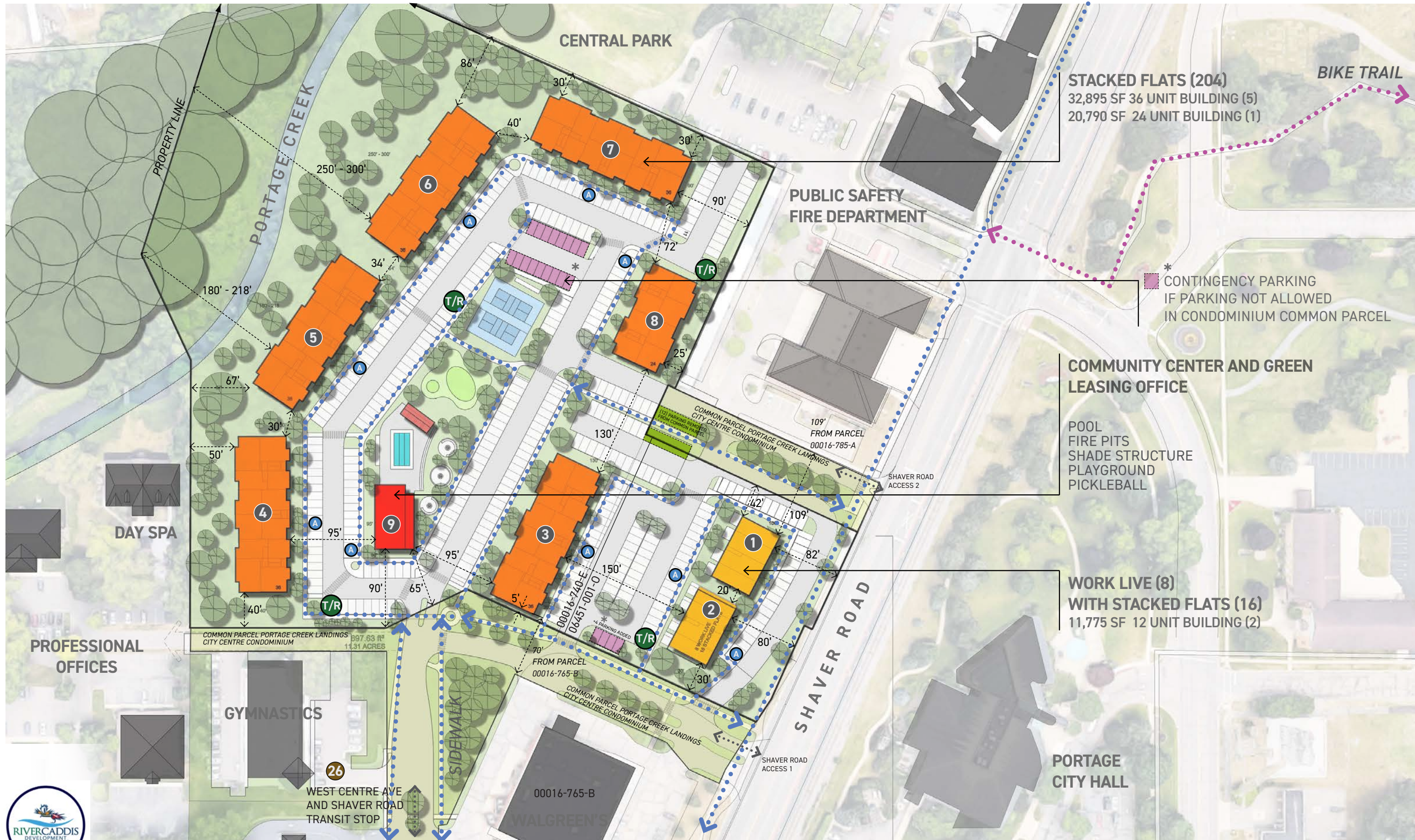


SITE PLAN A | SCHEMATIC DESIGN - SCALE 1" = 100'



RIVER CADDIS MULTI-FAMILY DEVELOPMENT

PROJECT NARRATIVE	1	10	2023
PD APPLICATION	12	5	2022
	2022	10	02



SITE PLAN B | SCHEMATIC DESIGN - SCALE 1" = 100'
CONTINGENCY PARKING PLAN
IF PARKING NOT ALLOWED IN CONDOMINIUM COMMON PARCEL



RIVER CADDIS MULTI-FAMILY DEVELOPMENT | PROJECT NARRATIVE
PD APPLICATION

1 10 2023
12 5 2022
20221002

Staff's Site Pictures – January 9th & 11th 2023

Picture Map: Locations 1-10





Figure 1. Looking west across Shaver Road at subject property (property lines - red lines) within wooded lot. Driveway entrance adjacent to Fire Station is one of three access points



Figure 2. Looking west at subject property (property lines - red lines) within wooded lot along driveway entrance. Fire Station parking located to the right (north) of driveway.



Figure 3. Looking northwest at subject property behind fence gate. Building (background) in picture behind fence is located within site. Covered parking (in front of fence) for Fire Station is located to the right.



Figure 4. Looking north within subject property behind fence. Buildings in picture are located within site. Fire Station covered parking located to the right (outside of picture).



Figure 5. Looking west. Left of fence is subject site, to the right is City of Portage Central Park.



Figure 6. Looking west across Shaver Road. Driveway entrance next to Walgreens is the second entrance along Shaver Road into site.



Figure 7. Looking northwest along access drive from Shaver Road. The Little Gym of Kalamazoo can be seen in background.



Figure 8. Looking north across W. Centre Avenue at third access driveway into subject site.



Figure 9. Looking north toward the site (wooded lot) along the third access driveway.



Figure 10. Looking north into the subject site. Buildings in background are pictured in Figure 4.

Biqi Zhao

From: JONNIE RICHARDS <MEDEVAC22@msn.com>
Sent: Sunday, January 15, 2023 2:14 PM
To: Biqi Zhao; Kelly Peterson
Cc: Patricia Randall; mcginnip@portegemi.gov
Subject: Tentative Plan and Rezoning Application (#22/23-7) Mixed Use Development at 412 W. Centre Ave.

CAUTION: THIS EMAIL IS FROM AN EXTERNAL SENDER

Do not click on links or open attachments unless this is from a sender you know and trust.

Dear Ms. Zhao and Ms. Peterson,

I am a Portage resident and have reviewed the noted application using the regulations as published on the City's website. This project does not meet any of the significant requirements of the PD zoning and should be rejected.

1. Division 11.-Planned Development District. Sec. 42-374 - Site development requirements. Paragraph C. Non-applicability of other zoning regulations; mixture of housing types: The applicant must demonstrate that the proposed plan cannot be developed under other sections of this article, or provide for a mixture of at least two of the following three housing types: one-family attached or detached, two-family or multifamily. *Since the project does not include one family or duplexes, by default it does not meet this requirement.* Sec.42-137 Work/live accommodations. B. Applicability,1. Work/live buildings are permitted as special land uses in OS-1, B-2, B-3 and CPD. *By default, they are not allowed in PD zoning. I believe that staff's statement to the contrary is inaccurate.*

The applicant has not demonstrated that the development cannot be developed under other sections of this article, quite the contrary. The separate parcel along Westnedge is already zoned CPD, which as noted above, allows Work/live units. The other separate parcel, as planned multifamily, is RM-1 zoning. So, I asked myself, why would an apartment developer intentionally submit an application for a zoning change to a classification that it does not qualify for in any way. Apartment developers (I worked for one briefly) are not known for their altruism, leaving a nefarious intent as the most probable explanation.

2. Sec. 42-350 Schedule of regulations. A. RM-1 Multi-family. *I can do all the calculations, but I think this is something that staff should do, to determine what the density would be for this parcel under RM-1 regulations. It is highly probable that it will be far less than the current design, but that is not the real problem. On the chart there is footnote (7) for RM-1 zoning. 7a. ----paraphrasing. the number of rooms shall not be more than the square footage of the entire parcel divided by 1400, excluding wetlands and floodplains. It gets better, 7b ----- paraphrasing, if the district contains wetlands and floodplains the number of rooms shall not be more than the square footage of the wetland and /or the floodplain divided by 5,600. This is a fourfold decrease in the allowable density. Could this be the reason for the misuse of the PD zoning?*
3. Sec. 42-137 - Work/live accommodations. Applicability Item1. *As noted above, Work /live buildings are not permitted in PD zoning and also, they are not permitted RM-1 zoning.* C. Site development standards. 2. Live/work buildings, f. Only owners and employees of the business associated with the work/live building and who meet the definition of a business owner or employee may occupy the residential dwelling unit portion. *The applicant does not mention this and how does the City enforce this requirement, or the other requirements for this use?*

4. Density. Even for PD Zoning (which this does not qualify as) a threefold increase in density is exceedingly excessive and should not be approved.
5. Parking. The "parking" problem is of the applicants' own making by ignoring the regulations and requesting excessive density. The 228 renters will use up the 2 per unit requirement and these renters will have a significant number of guests, especially with the amenities, and even two will not be enough.
6. Access. I am not familiar with Portage Creek Landings City Centre Condominium project but the land in question does not appear to serve anyone but Walgreens and the two businesses to the west. The project, rezoning request and the density could not be build without the access they afford so the applicant should be required to purchase the property or obtain a fully executed, iron clad agreement before the approval of the tentative plat.
7. Traffic. This project will cause a very large increase in traffic on two very busy thoroughfares. Imagine yourself living there and trying to get to work with 224+ other people in the morning, trying to go left on Westnedge or worse, trying to turn left onto Centre street which has very little stacking space from this exit. The applicant caused the traffic problems by his own actions requesting excessive density. A complete accurate and honest traffic study should be required before the approval of the tentative plat.
8. Pedestrian access. The applicant, and to a certain extent staff, have embellished the extent of access and all the wonderful places within easy pedestrian access. Easy access would include Centre Park, the fire station, the police station, city hall, Walgreens, and the single bus stop. Anything else is either further away or requires the crossing of two very busy thoroughfares. Schools for example, do you really want your children to have to cross Westnedge and Centre in the morning and evening rush hours to walk to school? How about requiring staff or the applicant to create a diagram to indicate exactly where these wonderful are located, the distance they are from the center of the project and how you get there.
9. Rent Rates. Staff indicates that the applicant needs the excessive density " to help achieve rent rates for the location". They also quote the 2022 Attainable Housing Plan "providing more housing for households with income levels up to 120% AMI (Area Median Income) and so on and so forth. Later on, they talk about rents based on the market. Everyone knows that the housing market in Portage is very hot, home prices and rental rates are very high for a number of reasons, the "market rental rate" will be very high and the developer will charge the highest rate he can. The goals of the Attainable Housing Plan are noble, but no way connected to this project, unless you consider massive density a noble goal. That is the glaring error in this whole project, nothing is actually quantified or guaranteed. The rezoning request should indicate exactly what rental rate is being used and offer an agreement with the city to lock it in for a certain period of time. Rent control, see how the developer reacts to that. If this is not done, you can throw all the noble goals and "feel good" rhetoric out the window, and the purpose of all this is for the developer to "make more money".

The city council can essentially do what ever it wants through variances and waivers but I think it's important for the council and the public to know exactly what is being given up and at what cost. I think staff should be prepared to answer these questions.

1. Does the plan meet the PD zoning requirements? If yes, exactly what concessions would be needed to meet the PD zoning. If no, exactly why not and what zoning would be appropriate?
2. If the plan was RM-1 for the multi -family parcel, what density would be allowed, especially considering the wetlands/floodplain regulations? What is the applicant's density for this parcel?

3. If the other parcel remained at CPD, does the plan meet the zoning requirements and the Work/live requirements and how do you enforce them?
4. How does the City enforce the rental rates to attain the stated goals?
5. What is the current AMI in dollars and what does that relate to in rental rates?
6. What are the current rental rates for all the apartments in Portage?
7. What are the current rental rates for similar apartments, with amenities, in Portage? The surrounding area?

These are the big ones, if you drill down further you can come up with a lot more? I am happily retired, but if you're short-handed or staff needs additional help, I would volunteer to help on a part-time basis.

Jonnie Richards
269-808-7159

	BLDG 36(5)	BLDG 24(1)	WK/LV (2)	TOTAL	NOTES
WORK/LIVE	-	-	8	-	8 980 SF
1 BR UNIT	24	24	8	-	152 3 SIZES
2 BR UNIT	12	0	8	-	68
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TOTAL	180	24	24	-	228 ESTIMATED

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SITE AREA | ~462,170 SF

~10.61 ACRES

RESIDENTIAL UNIT DENSITY | 228 UNITS
21.5 UNITS/ACRE

 ACCESSIBLE PARKING SPACE

 TRASH/RECYCLE ENCLOSURE

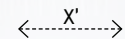
 SIDEWALK - INTERNAL

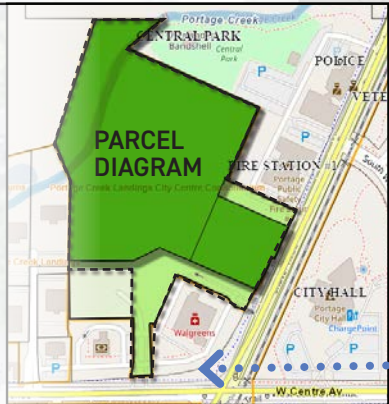
 SIDEWALK

 BIKE PATH

 KALAMAZOO METRO TRANSIT

BROWN AND CURRIER TRANSIT STOP
W. CENTRE AVE AND SHAVER RD TRANSIT STOP

 SETBACK



INTEGRATED
ARCHITECTURE

SITE PLAN B | SCHEMATIC DESIGN - SCALE 1" = 120'

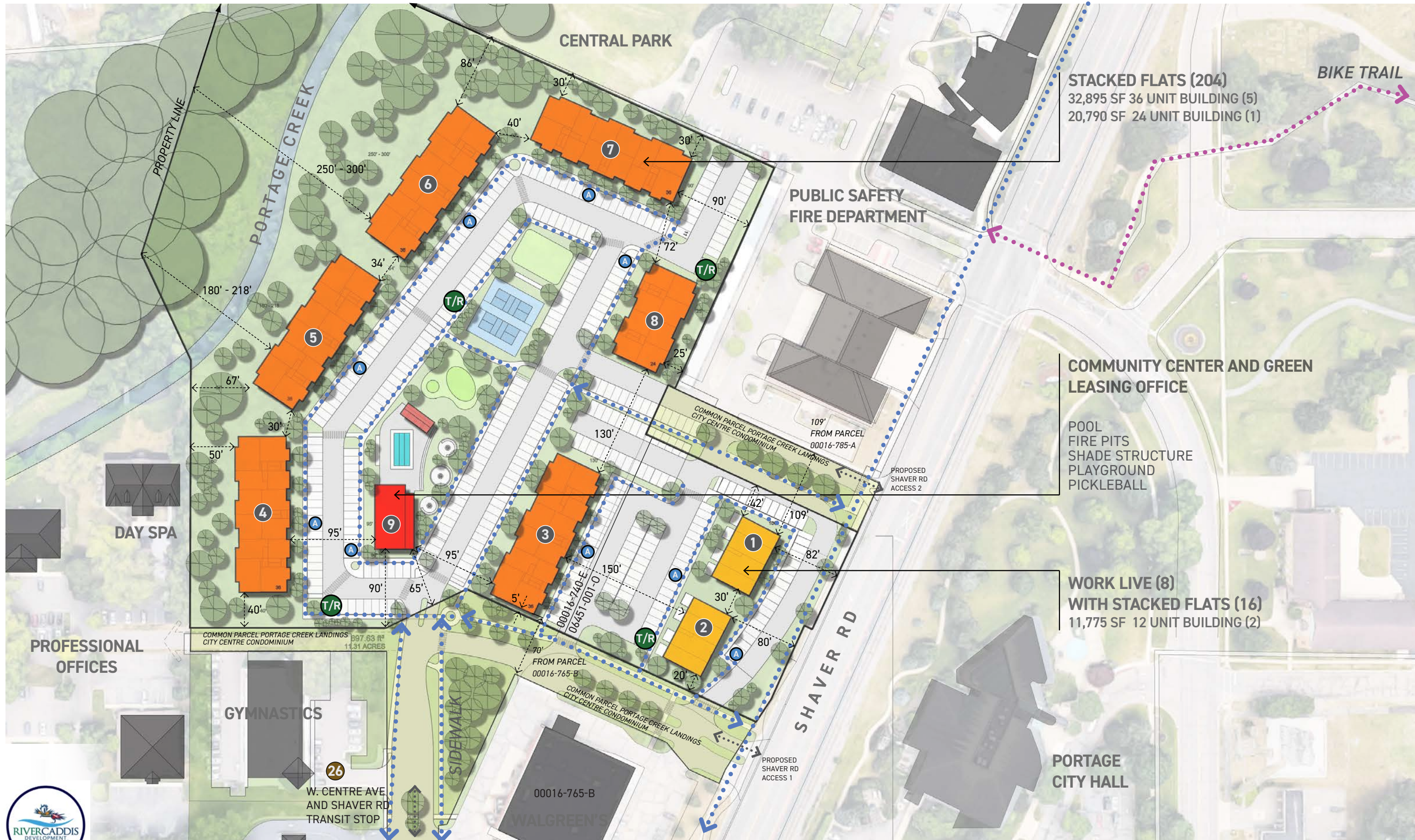
CONTINGENCY PARKING PLAN
IF PARKING NOT ALLOWED IN CONDOMINIUM COMMON PARCEL



0' 60' 120' 240' ↑ N

RIVER CADDIS MULTI-FAMILY DEVELOPMENT | PD APPLICATION

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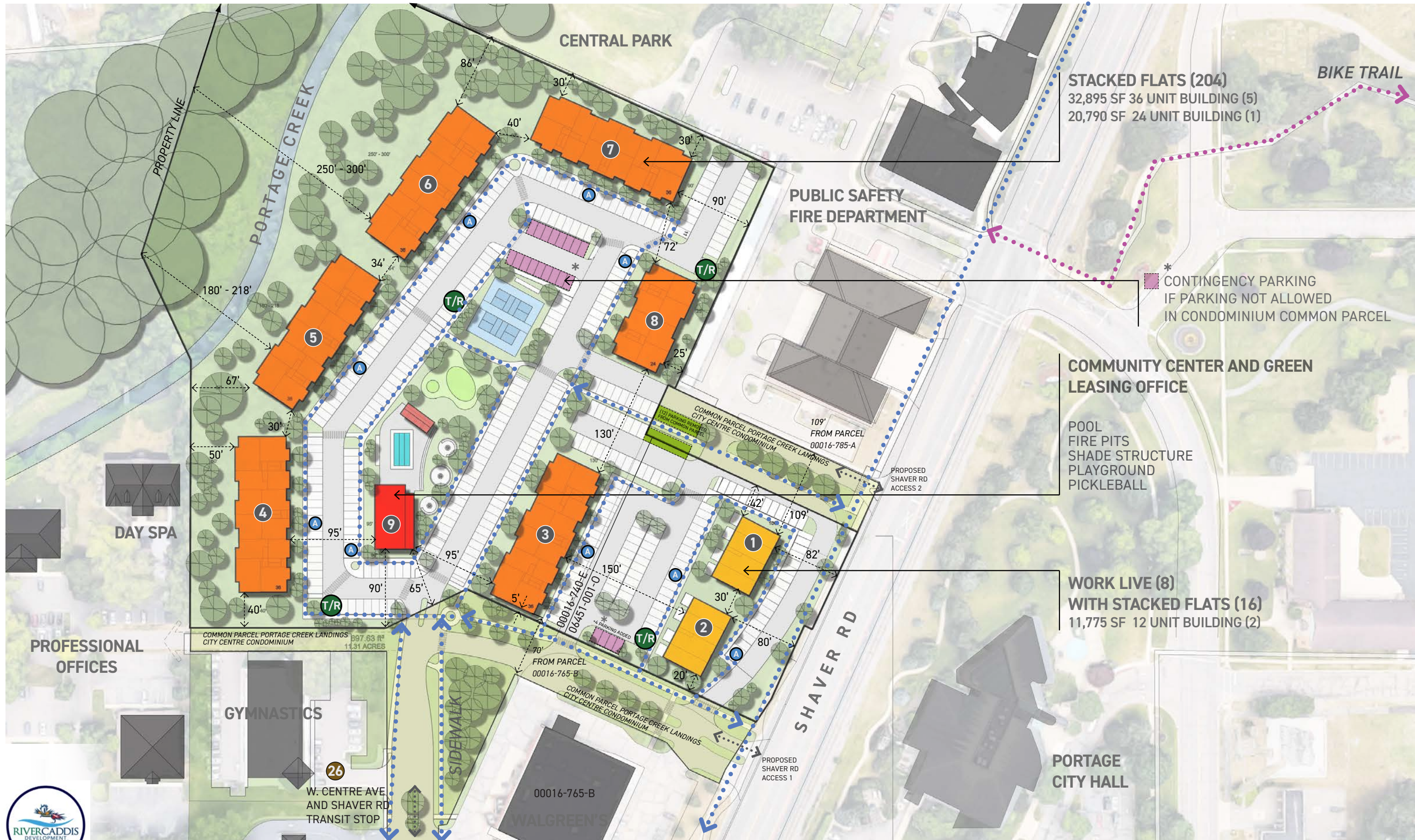


SITE PLAN A | SCHEMATIC DESIGN - SCALE 1" = 100'

RIVER CADDIS MULTI-FAMILY DEVELOPMENT | PD APPLICATION

PROJECT NARRATIVE

1	17	2023
1	10	2023
12	5	2022
20	21	002



SITE PLAN B | SCHEMATIC DESIGN - SCALE 1" = 100'

CONTINGENCY PARKING PLAN
IF PARKING NOT ALLOWED IN CONDOMINIUM COMMON PARCEL



RIVER CADDIS MULTI-FAMILY DEVELOPMENT | PD APPLICATION

PROJECT NARRATIVE	1	17	2023
	1	10	2023
	12	5	2022
	20	21	002

JANUARY 16, 2023

PORTAGE CREEK DEVELOPMENT PORTAGE, MICHIGAN



Prepared for:
Mr. Dan Wisinski
River Caddis Development
1038 Trowbridge Rd
East Lansing, MI 48823

Prepared by:
Leigh Burgess, PE, PTOE
RS ENGINEERING, LLC
6709 Centurion Drive, Suite 300
Lansing, Michigan 48917
Phone: 517.908.0877

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Agency Review	Date	Comments

TRAFFIC IMPACT STUDY

PORTAGE CREEK DEVELOPMENT
PORTAGE, MI

Table of Contents

1	Project Background	1
2	Data Collection	3
2.1	Existing Roadway System.....	3
2.2	Traffic Counts.....	4
2.3	Background Traffic Growth.....	5
3	Site Analysis	6
3.1	Trip Generation	6
3.2	Internal Trip Capture	7
3.3	Trip Distribution	7
3.4	Pass-By Trips.....	9
3.5	Traffic Volumes	10
4	Traffic Analysis	16
4.1	Intersection Capacity Analysis	16
4.2	Turning Lane and Passing Flare Warrants.....	24
4.3	Sight Distance Analysis.....	25
5	Conclusions and Recommendations	27
6	Bibliography.....	29

Appendices

- A SITE PLAN INFORMATION
- B EXISTING TRAFFIC DATA
- C TRAFFIC ANALYSIS
- D SYNCHRO AND SIM TRAFFIC REPORTS

List of Tables

TABLE 1: INTERSECTION PEAK HOURS	4
TABLE 2: EXISTING 2022 TRAFFIC VOLUMES	5
TABLE 3: FUTURE 2024 TRAFFIC VOLUMES	6
TABLE 4: FUTURE TRIP GENERATION.....	7
TABLE 5: FUTURE BUILD-OUT AM PEAK HOUR TRIP DISTRIBUTION	9
TABLE 6: FUTURE BUILD-OUT PM PEAK HOUR TRIP DISTRIBUTION	9
TABLE 7: SIGNALIZED AND UNSIGNALIZED INTERSECTION LOS	16
TABLE 8: W. CENTRE AVE AND SHAVER RD – LOS AND DELAYS	18
TABLE 9: W. CENTRE AVE AND SHAVER RD – QUEUES	18
TABLE 10: SHAVER RD AND S. WESTNEDGE AVE – LOS/DELAYS	19
TABLE 11: SHAVER RD AND S. WESTNEDGE AVE – QUEUES	19
TABLE 12: W. CENTRE AVE AND S. WESTNEDGE AVE – LOS/DELAYS.....	20
TABLE 13: W. CENTRE AVE AND S. WESTNEDGE AVE – QUEUES.....	20
TABLE 14: SHAVER RD AND NORTH SITE DRIVEWAY – LOS/DELAYS	21
TABLE 15: SHAVER RD AND NORTH SITE DRIVEWAY – QUEUES	21
TABLE 16: SHAVER RD AND SOUTH SITE DRIVEWAY – LOS/DELAYS	22
TABLE 17: SHAVER RD AND SOUTH SITE DRIVEWAY – QUEUES	22
TABLE 18: W. CENTRE AVE AND SITE DRIVEWAY – LOS/DELAYS	23
TABLE 19: CENTRE AVE AND SITE DRIVEWAY – QUEUES	23

List of Exhibits

EXHIBIT 1: SITE LOCATION MAP	1
EXHIBIT 2: PROPOSED SITE MAP.....	2
EXHIBIT 3: STUDY INTERSECTIONS/DRIVEWAYS	3
EXHIBIT 4: TRIP DISTRIBUTION	8
EXHIBIT 5: 2022 EXISTING TRAFFIC VOLUMES DIAGRAM	11
EXHIBIT 6: 2024 NO-BUILD TRAFFIC VOLUMES DIAGRAM	12
EXHIBIT 7: TRIP DISTRIBUTION DIAGRAM	13
EXHIBIT 8: TRIP GENERATION DIAGRAM	14
EXHIBIT 9: 2024 FUTURE BUILD-OUT DIAGRAM.....	15
EXHIBIT 10: RIGHT-TURN LANE WARRANT ANALYSIS	24
EXHIBIT 11: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND SOUTH SITE DRIVEWAY	25
EXHIBIT 12: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND NORTH SITE DRIVEWAY	26
EXHIBIT 13: SIGHT DISTANCE TRIANGLE AT W. CENTRE AVE AND SITE DRIVEWAY	26

1 Project Background

The traffic impact study included herein was completed for River Caddis Development for their use in the planning and design approval process for the development including a 228-unit apartment complex and 2 work-live buildings. RSE prepared this analysis to examine the potential traffic impacts of the proposed multi-family housing development on the adjacent roadway network. The proposed development is located near the northwest quadrant of W. Centre Ave and Shaver Rd in Portage, MI. The proposed site will have one access driveway from W. Centre Ave and two access driveways from Shaver Rd. All three proposed access points are existing driveways. The existing site is vacant/wooded. The site location is shown on **Exhibit 1**.

EXHIBIT 1: SITE LOCATION MAP



Map Data © 2022 Google Maps

The proposed Portage Creek site plan was provided by River Caddis Development. The proposed site plan will develop 228 units of residential buildings with 2 work-live buildings on the existing wooded land. Per the ITE Trip Generation Manual (11th Ed.), the Multi-Family Housing (Low Rise) calculates an average of 2.72 residents per occupied dwelling unit. Planned completion of the development is in year 2024.

For analysis purposes, the build-out year for the Portage Creek development is projected for year 2024. For trip generation purposes, the following land use was used to represent the development:

- Multifamily Housing (Low Rise) – Dwelling Units

The proposed multi-family housing development with work-live buildings will have three access points (driveways). One driveway is located on W. Centre Ave, west of Walgreens. The second driveway is located on Shaver Rd, north of Walgreens. The third driveway is located on Shaver Rd, south of the Portage Department of Public Safety building. All three driveways are existing. The proposed site map including the access points is shown in **Exhibit 2**.

EXHIBIT 2: PROPOSED SITE MAP

The traffic analysis will focus on the build-out of the new multi-family housing and work-live development and its impacts on traffic operations at the existing/proposed driveways and on the adjacent roadway network. Traffic operations are evaluated for the existing/proposed driveways and existing intersection locations. Based on coordination with the City of Portage, the site access driveways and intersections listed below will be included in the analysis. These intersections and driveways were included both for traffic modeling purposes and due to the potential impacts of the proposed development. All required study roadways, intersections, and driveways for the proposed site development are shown on **Exhibit 3**.

Driveways/Intersections

- Shaver Rd at West Centre Ave
- Shaver Rd at Westnedge Ave
- Existing Walgreens Drive (South Site Drive) at Shaver Rd
- Existing North Site Drive at Shaver Rd
- Existing Site Drive at W Centre Ave
- Shaver Rd at S Westnedge Ave

EXHIBIT 3: STUDY INTERSECTIONS/DRIVEWAYS



2 Data Collection

2.1 Existing Roadway System

The proposed site is located at the northwest quadrant of Centre Ave and Shaver Rd in Portage, MI. There are three existing/proposed driveways for the proposed housing development. One driveway is located on W. Centre Ave and two are located on Shaver Rd.

There are three major signalized intersections located within the limits of the study. They include W. Centre Ave at Shaver Rd, Shaver Rd at S Westnedge Ave, and W. Centre Ave at S Westnedge Ave.

W. Centre Ave is an east-west, 4-lane paved roadway with a center left turn lane. It is under the jurisdiction of MDOT. It is classified as other principal arterial and has a posted speed of 35 mph, which increases to 40 mph westbound west of Shaver Rd.

Shaver Rd is a north-south, 4-lane paved roadway with a center left turn lane. It is under the jurisdiction of MDOT. It is classified as other principle arterial and has a posted speed limit of 35 mph.

S Westnedge Ave runs generally north-south and bends at the intersection with Shaver Rd. It is a 4-lane paved roadway. It is under the jurisdiction of MDOT. It is classified as a minor arterial and has a posted speed limit of 30 mph between W. Centre Ave and Shaver Rd, increasing to 35 mph north of the intersection with Shaver Rd.

2.2 Traffic Counts

Turning movement counts at the following study intersections were collected by RS Engineering (RSE) using Miovision on Tuesday December 6, 2022, and Thursday December 8, 2022.

- Shaver Rd and Westnedge Rd
- Shaver Rd and Walgreens Driveway (Shaver Rd South Site Dr)
- Shaver Rd and W. Centre Ave
- W. Centre Ave and S. Westnedge Ave
- W. Centre Ave and Site Driveway (Centre Ave Site Dr)

Signal timing information was provided by the City of Portage.

The peak hour traffic counts were conducted during a *typical*¹ work/school day. The client collected turning movement counts during the AM and PM peak hours within the following hours:

AM Peak: 7:00am - 9:00am
PM Peak: 4:00pm - 6:00pm

The Miovision raw traffic data collection summary sheets are provided **Appendix B**. The turning movement count data was reviewed, and it was determined that the AM and PM peak hours at each intersection occur during the following time periods:

TABLE 1: INTERSECTION PEAK HOURS

1	W. Centre Rd and Shaver Ave	7:15-8:15 AM	4:00-5:00PM
2	Shaver Rd and S. Westnedge Ave	7:15-8:15 AM	4:30-5:30 PM
3	W. Centre Rd and S. Westnedge Ave	7:00-8:00 AM	4:30-5:30 PM
4	Shaver Rd and Walgreens Driveway (Shaver Rd South Site Dr)	8:00-9:00 AM	4:00-5:00 PM
5	W. Centre Ave and Site Driveway (Centre Ave Site Dr)	7:15-8:15 AM	4:30-5:30 PM

The peak hour traffic volumes for the AM and PM peaks used in the analysis for the existing conditions are shown in **Table 2**.

¹ A "typical" day for traffic data collection purposes is a non-holiday, mid-week (Tuesday, Wednesday, Thursday) and standard traffic and weather conditions.

TABLE 2: EXISTING 2022 TRAFFIC VOLUMES

Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count	
			AM Peak	PM Peak				AM Peak	PM Peak
W. Centre Ave at Shaver Rd	Eastbound	Left	86	190	Shaver Rd North Site Driveway	Eastbound	Left	0	0
		Thru	707	584			Right	22	11
		Right	131	218		Northbound	Left	27	53
	Westbound	Left	138	180			Thru	328	564
		Thru	646	768		Southbound	Thru	270	716
		Right	12	25			Right	0	0
	Northbound	Left	89	182	Shaver Rd South Site Driveway	Eastbound	Left	8	16
		Thru	234	392			Right	8	32
		Right	103	214		Northbound	Left	1	4
	Southbound	Left	17	59			Thru	347	601
		Thru	173	507		Southbound	Thru	274	674
	Right	69	130	Right			18	53	
Shaver Rd at S. Westnedge	Eastbound	Left	1	4	W. Centre Ave Site Driveway	Eastbound	Left	13	45
		Thru	0	8			Thru	921	1046
		Right	2	9		Westbound	Thru	754	1032
	Westbound	Left	5	19			Right	12	30
		Thru	3	4		Southbound	Left	1	28
		Right	240	344			Right	13	55
	Northbound	Left	3	2	2022 Traffic Volumes				
		Thru	294	552					
		Right	31	10					
	Southbound	Left	229	347					
		Thru	263	688					
		Right	6	2					
W. Centre Ave at S. Westnedge	Eastbound	Left	12	26					
		Thru	706	742					
		Right	127	166					
	Westbound	Left	111	169					
		Thru	519	823					
		Right	52	90					
	Northbound	Left	174	123					
		Thru	153	155					
		Right	169	113					
Southbound	Left	107	120						
	Thru	116	177						
	Right	3	13						

2.3 Background Traffic Growth

The proposed new multi-family housing and work-live development is projected to be completed by 2024. Since traffic counts were collected in year 2022, a growth rate must be applied to the existing turning movement counts. An annual growth rate of 0.5% was used to calculate the 2024 traffic volumes. The 0.5% growth rate was applied to each of the intersection's turning movement counts. A summary of those results is shown in **Table 3**.

TABLE 3: FUTURE 2024 TRAFFIC VOLUMES

Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count	
			AM Peak	PM Peak				AM Peak	PM Peak
W. Centre Ave at Shaver Rd	Eastbound	Left	87	192	Shaver Rd North Site Driveway	Eastbound	Left	0	0
		Thru	715	590			Right	23	12
		Right	133	221		Northbound	Left	28	54
	Westbound	Left	140	182			Thru	332	570
		Thru	653	776		Southbound	Thru	273	724
		Right	13	26			Right	0	0
	Northbound	Left	90	184	Shaver Rd South Site Driveway	Eastbound	Left	9	17
		Thru	237	396			Right	9	33
		Right	105	217		Northbound	Left	2	5
	Southbound	Left	18	60			Thru	351	608
		Thru	175	513		Southbound	Thru	277	681
	Right	70	132	Right			19	54	
Shaver Rd at S. Westnedge	Eastbound	Left	2	5	W. Centre Ave Site Driveway	Eastbound	Left	14	46
		Thru	0	9			Thru	931	1057
		Right	3	10		Westbound	Thru	762	1043
	Westbound	Left	6	20			Right	13	31
		Thru	4	5		Southbound	Left	2	29
		Right	243	348			Right	14	56
	Northbound	Left	4	3	Year 2024 Future Traffic Volumes (0.5% Growth)				
		Thru	297	558					
		Right	32	11					
	Southbound	Left	232	351					
		Thru	266	695					
		Right	7	3					
W. Centre Ave at S. Westnedge	Eastbound	Left	13	27					
		Thru	714	750					
		Right	129	168					
	Westbound	Left	113	171					
		Thru	525	832					
		Right	53	91					
	Northbound	Left	176	125					
		Thru	155	157					
		Right	171	115					
Southbound	Left	109	122						
	Thru	118	179						
	Right	4	14						

3 Site Analysis

3.1 Trip Generation

The *ITE Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, 2021) provides equations and rates to calculate the estimated traffic from over 170 different land uses. The proposed site plan is to develop 228 residential units with 8 work-live spaces. The following ITE Trip Generation Land Use was identified and used in the analysis.

- Land Use 220 – Multi-Family Housing (Low Rise)

According to the ITE Trip Generation Manual, low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Trips generated by the housing development are captured using Land Use 220, Multi-

family Housing (Low-Rise). This land use was chosen due to similar size and occupancy of the development. The ITE land use and estimated trip generation for the Future Build-Out during the weekday AM and PM peak hours are summarized in **Table 4** and **Appendix C**.

TABLE 4: FUTURE TRIP GENERATION

Portage Creek Development Trip Generation (Trip Generation Manual 11th Edition)											
LUC	Description	Number	Unit	AM Peak				PM Peak			
				Equation	In	Out	Total	Equation	In	Out	Total
220	Multifamily Housing (Low-Rise)	228	Dwelling Unit	$T = 0.31(X) + 22.85$	23	71	94	$T = 0.43(X) + 20.55$	75	44	119
				Total	23	71	94	Total	75	44	119

3.2 Internal Trip Capture

The ITE Trip Generation Manual does not account for a development with two or more complementary land uses or a mixed-use development. At a mixed-use development, there is potential for interaction among those land uses; this is referred to as *Internal Capture*. As a result, the total generation of external trips (trips entering and exiting the overall site) may be less than the simple sum of the trips generated by each individual land use. The methodology to correct this error is presented in the *NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*.

Based on the proposed development's land use and site layout, internal trip capture was not included during the AM or PM peak hours. Internal trips are not expected for this development and the land uses were not listed on the *NCHRP Report 684*.

The *NCHRP 684* report incorporates non-motorized trips. A non-motorized trip is defined as a person trip that is part of either a walk trip or bicycle trip. The greater the percentage of non-motorized trips the lower the number of vehicles trips. Non-motorized trips are more typical in urban core locations and areas with pedestrian/bike trails. The proposed housing development will not incorporate a percentage of non-motorized trips. This will ensure a more conservative representation of traffic generated by the development into the roadway network.

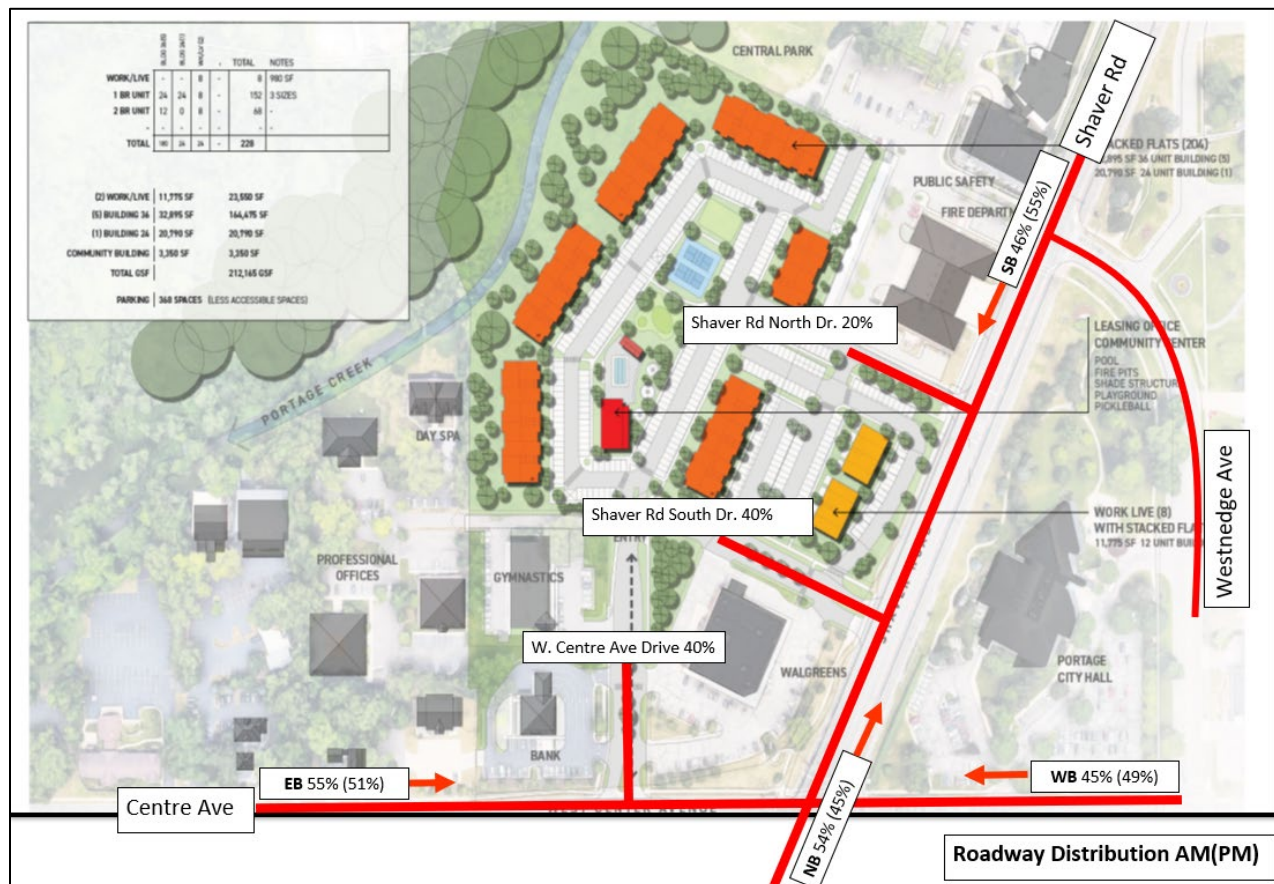
3.3 Trip Distribution

Trips generated by the proposed development must be distributed at the site access point so that the impacts on the existing roadway system and intersections can be evaluated. The total trips generated for the Future Build-Out were distributed at the site access point based on the following factors:

- Existing peak hour traffic distribution along W. Centre Ave
 - AM
 - EB approach: **55%**
 - WB approach: **45%**
 - PM
 - EB approach: **51%**
 - WB approach: **49%**
- Existing peak hour traffic distribution along Shaver Rd

(RSE# 999-22-025)

- AM
 - NB approach: **54%**
 - SB approach: **46%**
- PM
 - NB approach: **45%**
 - SB approach: **55%**
- The existing roadways and proposed site trip distributions are shown in **Exhibit 4**.
 - **40%** of the new trips will use the Existing Site Driveway on W. Centre Ave
 - **40%** of the new trips will use the Existing Walgreens Driveway on Shaver Rd
 - **20%** of the new trips will use the Existing North Site Driveway on Shaver Rd
- Based on the location of the driveways relative to the trip origin/destination, existing roadways and traffic signals, the following were assumed for typical traffic diversion:
 - Exiting traffic headed north from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB left turn to Shaver Rd).
 - Exiting traffic headed south from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB right turn to Shaver Rd).
- Peak hour/Time of day

EXHIBIT 4: TRIP DISTRIBUTION

Based on the factors above, the peak hour trip distribution percentages were developed. The trip distribution percentages and the subsequent results for the trips generated by the proposed site are shown in **Tables 5 and 6**.

TABLE 5: FUTURE BUILD-OUT AM PEAK HOUR TRIP DISTRIBUTION

ITE Trip Generation	AM Peak Hour Distribution											
Enter/Exit	Entering						Exiting					
Site Driveways	W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use	Multifamily Housing (Low-Rise)											
Total Enter/Exit	23						71					
Internal Distribution % *	40%		40%		20%		40%		40%		20%	
Access Point Distribution % **	45%	55%	46%	54%	46%	54%	45%	55%	46%	54%	46%	54%
Access Point Volumes	4	5	4	5	2	3	13	15	13	15	7	8
Assumed Typical Diversion ***	N/A						N/A	-5	3	N/A	N/A	2
All Land Uses Total	4	5	4	5	2	3	13	10	16	15	7	10

TABLE 6: FUTURE BUILD-OUT PM PEAK HOUR TRIP DISTRIBUTION

ITE Trip Generation	PM Peak Hour Distribution											
Enter/Exit	Entering						Exiting					
Site Driveways	W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use	Multifamily Housing (Low-Rise)											
Total Enter/Exit	75						44					
Internal Distribution % *	40%		40%		20%		40%		40%		20%	
Access Point Distribution % **	49%	51%	55%	45%	55%	45%	48%	51%	55%	45%	55%	45%
Access Point Volumes	15	15	16	14	8	7	8	9	10	8	5	4
Assumed Typical Diversion ***	N/A						N/A	-4	2	N/A	N/A	2
All Land Uses Total	15	15	16	14	8	7	8	5	12	8	5	6

*Internal Distribution: Assumed 40% of the traffic will be using the driveway on W Centre Ave, 40% using the Walgreens driveway on Shaver, and 20% using the north driveway on Shaver.

** The initial access point distribution is based on existing traffic on W. Centre Ave (EB and WB) and Shaver Rd (NB and SB).

*** Typical Diversions: Exiting traffic headed north from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB left turn to Shaver Rd). Exiting traffic headed south from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB right turn to Shaver Rd).

3.4 Pass-By Trips

Pass-by trips are trips generated by the development from the adjacent street traffic. The pass-by trips do not decrease the total trips generated by the development; however, the total *new* trips generated by the development are decreased. A percentage of the trips generated by the site are taken from the existing traffic on the adjacent street. The *ITE Trip Generation Handbook, 3rd Edition (2018)* provides guidance for calculating the pass-by trips for applicable developments. Typically, retail establishments, banks, and fast-food restaurants are specifically located on or adjacent to busy streets to attract motorists already on the roadway. It is expected that the proposed site would generate a portion of its trips from pass-by traffic.

Based on the proposed development's land uses, pass-by trips were not considered during the AM or PM peak hours because pass-by trips are generally not considered for residential developments. In addition, the proposed land uses are not listed in ITE Trip Generation Handbook for consideration of pass-by trips.

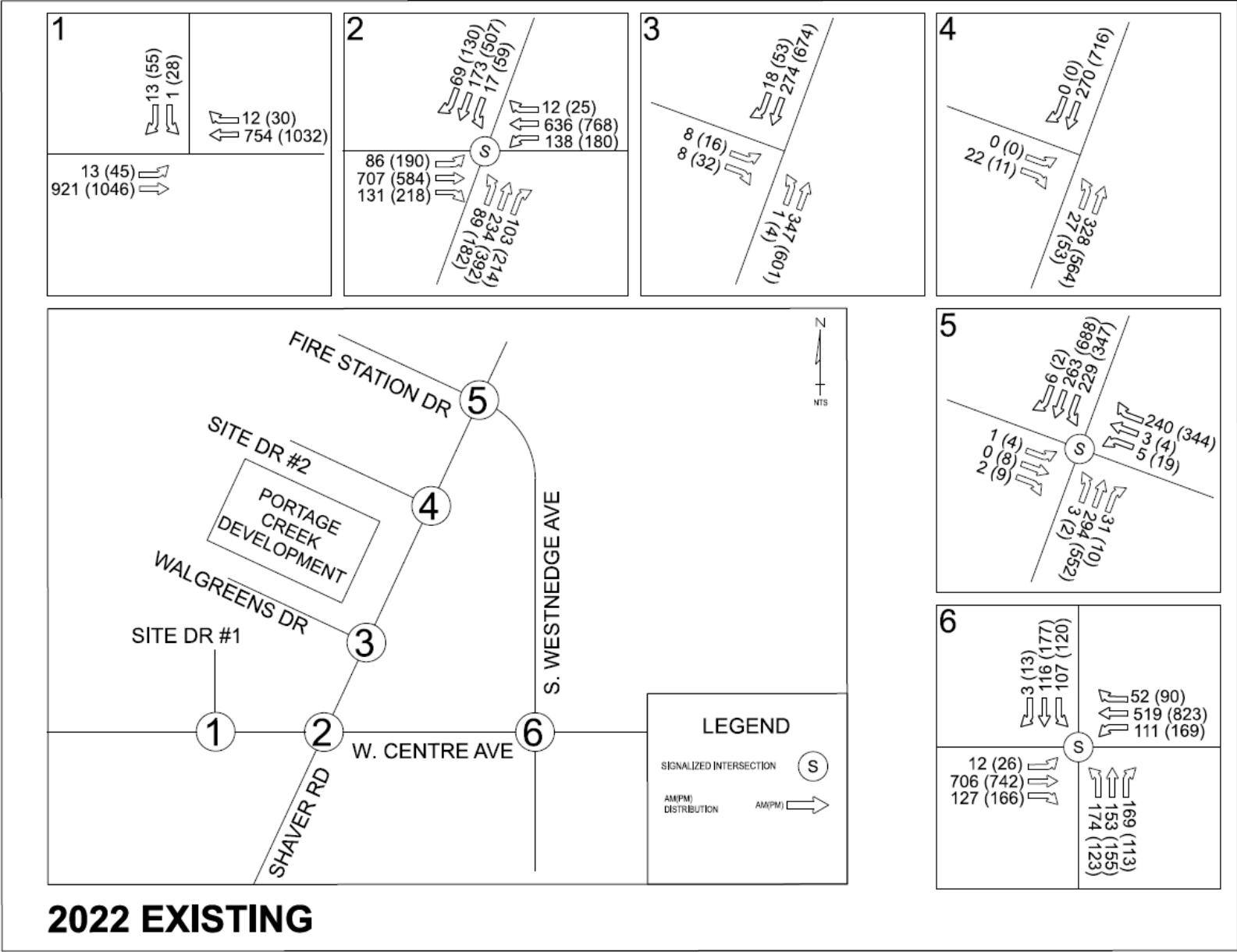
3.5 Traffic Volumes

The trips generated by the proposed site for the AM and PM peaks are added to the 2024 No-Build traffic Volumes. The 2022 Existing, 2024 No-Build, Trip Distribution, Trip Generation, and 2024 Build-Out traffic volumes for the AM and PM peaks are shown in **Exhibit 5** to **Exhibit 9**.

Existing traffic counts were collected by RS Engineering (RSE) using Miovision in December 2022. RSE applied a growth rate for all intersections to project traffic volumes to year 2024. Synchro dummy nodes were used in the traffic modeling to balance traffic volumes along W. Centre Ave and S. Westnedge Ave to account for uncounted driveways and intersections.

The diagram shown below in **Exhibit 5** represents the turning movements during peak hour volumes for 2022 existing volumes for each of the study intersections. **Exhibit 6** below shows the 2024 No-Build traffic volumes. This diagram represents the 2022 existing conditions plus a 0.5% growth rate for each year. **Exhibit 7** below shows the trip distribution diagram. This diagram represents the percentage of split of the new trips generated by the development. The percentage splits are based on existing traffic volumes. **Exhibit 8** below shows the trip generation diagram. This diagram represents the number of new trips entering and exiting the development with the origin and destination based on the trip distribution from Exhibit 7. **Exhibit 9** below shows the 2024 future Build-Out diagram. This diagram represents the volume for 2024 with the No-Build and trip generation volumes combined.

EXHIBIT 5: 2022 EXISTING TRAFFIC VOLUMES DIAGRAM



(RSE# 999-22-025)

EXHIBIT 6: 2024 NO-BUILD TRAFFIC VOLUMES DIAGRAM

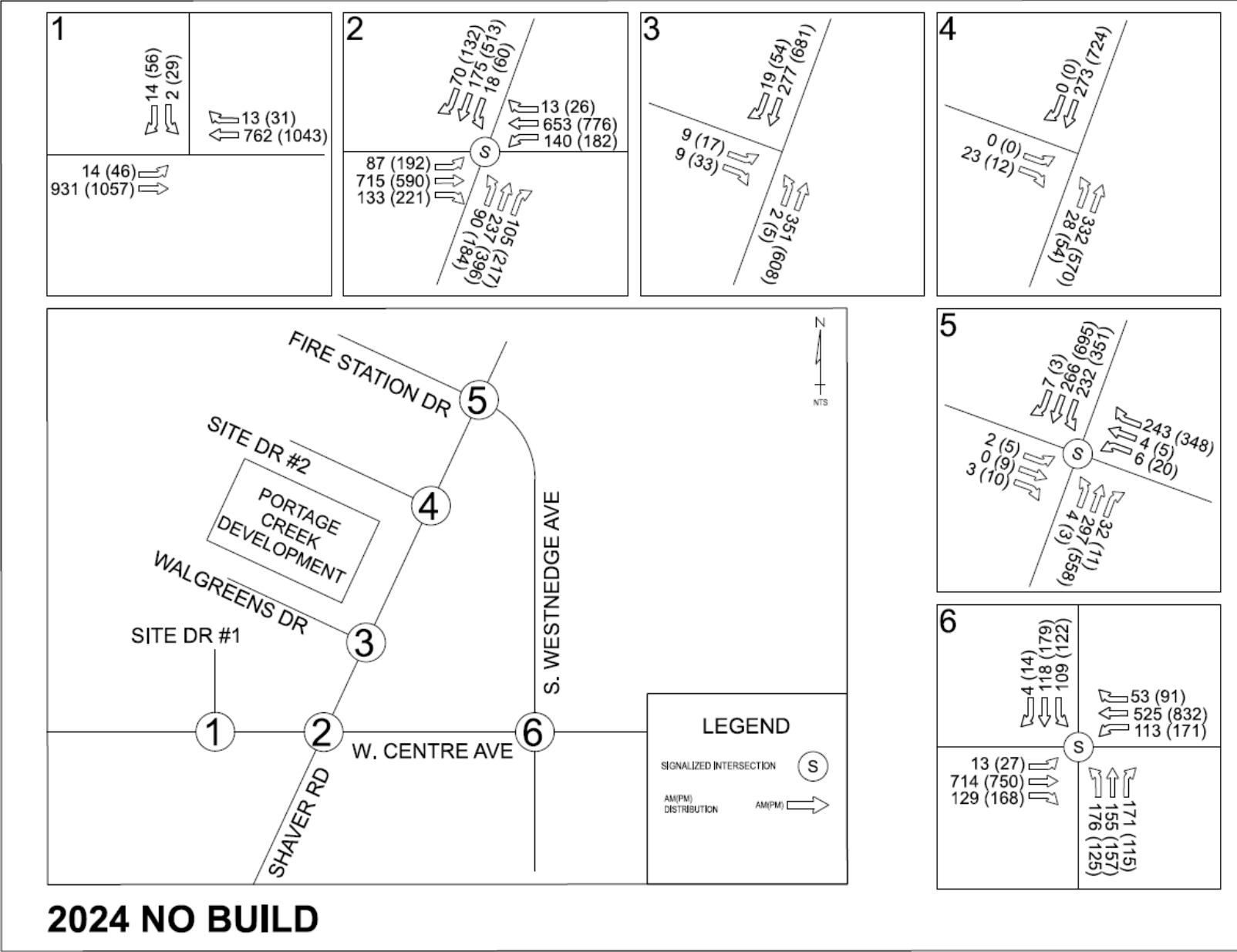


EXHIBIT 7: TRIP DISTRIBUTION DIAGRAM

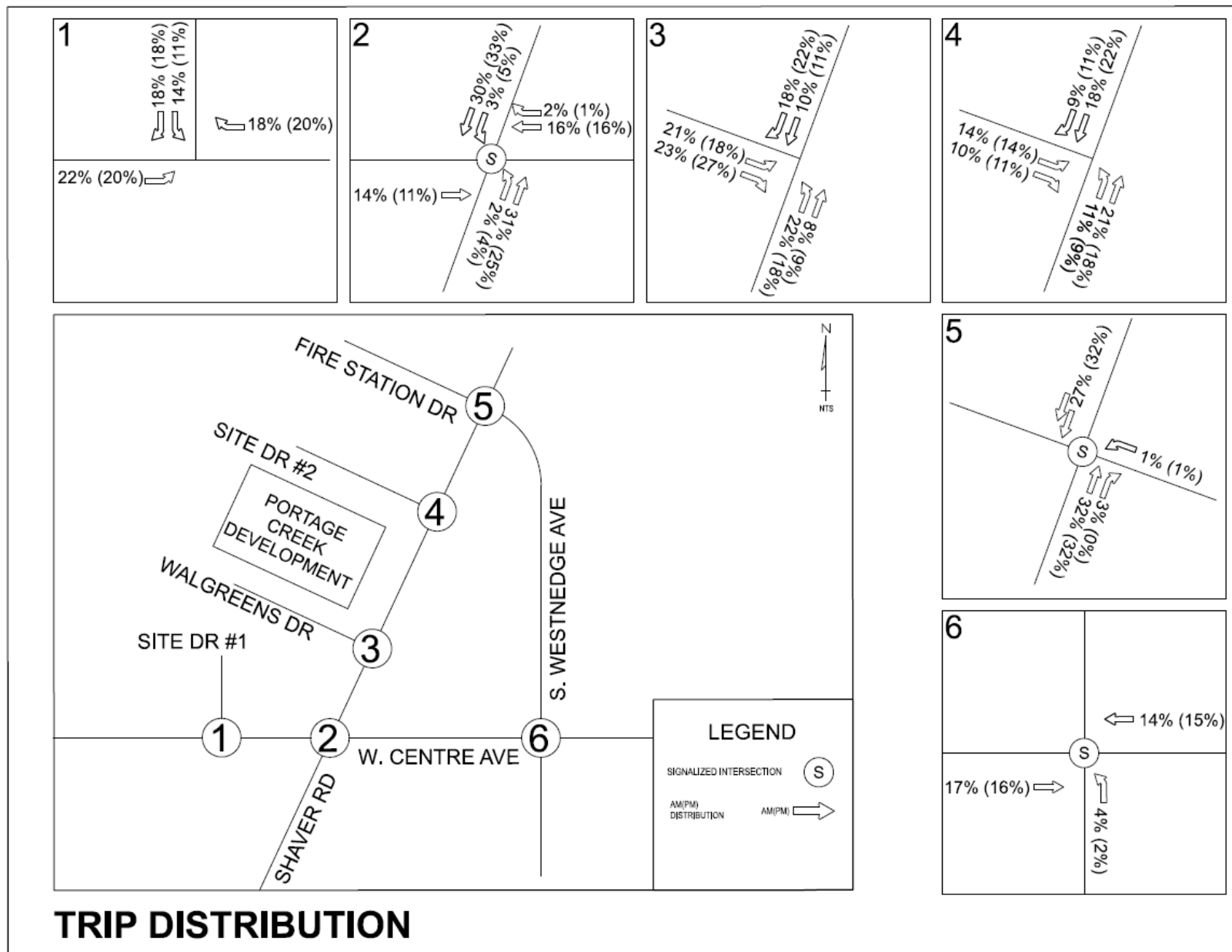
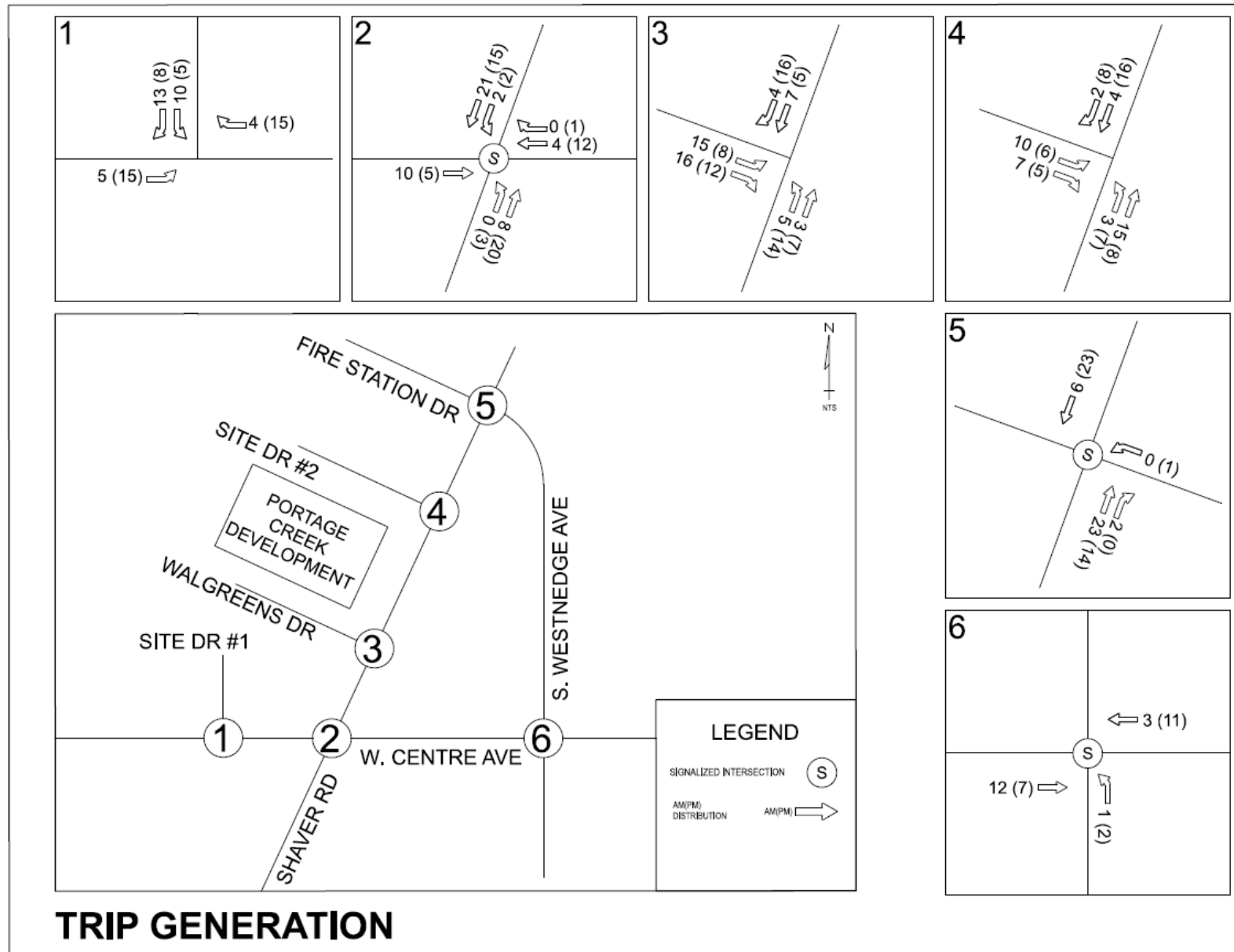
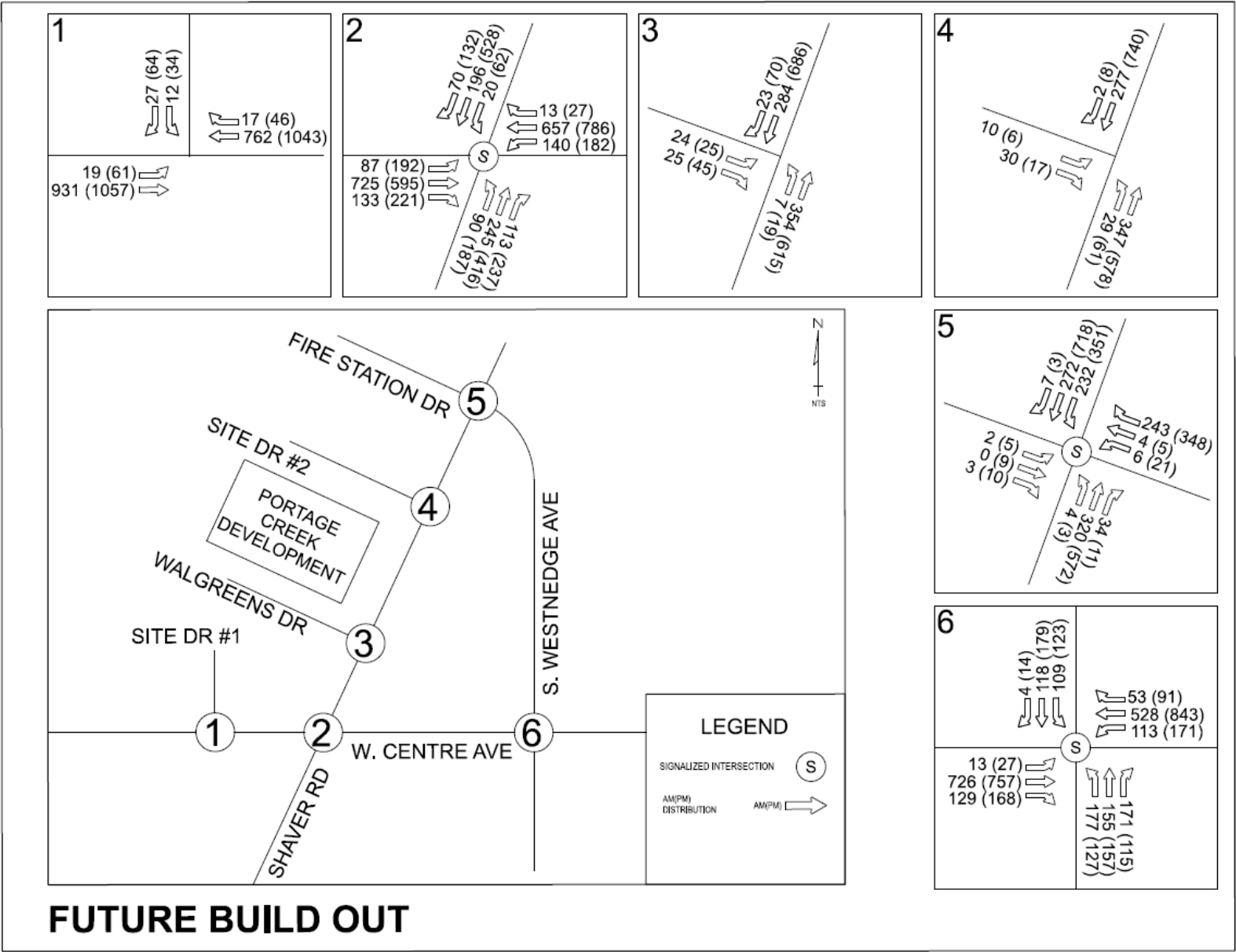


EXHIBIT 8: TRIP GENERATION DIAGRAM



(RSE# 999-22-025)

EXHIBIT 9: 2024 FUTURE BUILD-OUT DIAGRAM



4 Traffic Analysis

4.1 Intersection Capacity Analysis

4.1.1 Methodology

The intersection analyses were performed using the Synchro 11/SimTraffic 11 software packages. The 6th Edition Highway Capacity Manual (HCM) and HCM Unsignalized Intersection Capacity Analysis methodologies were used for evaluating intersection operations at the intersections. The methodology uses several variables input into the model to evaluate traffic operations including:

- Volume
- Peak Hour Factor (PHF)
- Speed
- Intersection Controls
- Signal Timing

The level-of service (LOS) criterion for both signalized and unsignalized intersections are summarized in **Table 7**. Signalized intersections have longer control delay criteria than unsignalized intersections, since drivers can see the traffic control and know that within a set period they will have permitted or protected movement through the intersection. Unsignalized intersections have more uncertainty than signalized intersections, and drivers are less willing to wait for extended periods for gaps in traffic; therefore, the control delay criteria are less than a signalized intersection.

TABLE 7: SIGNALIZED AND UNSIGNALIZED INTERSECTION LOS

Control Delay (sec/vehicle)		Level-of-Service (LOS)	Description
Signalized	Stop Control		
0-10	0-10	A	Minimal control delay
>10-20	>10-15	B	Slightly restricted, not significant delays
>20-35	>15-25	C	Stable operations
>35-55	>25-35	D	Less stable, increased delays
>55-80	>35-50	E	Unstable operations, significant delays
>80	>50	F	Congested, high delay, extensive queues

The SimTraffic 11 software was used to model and simulate the traffic operations at the study intersections. The traffic modeling parameters used in the models are based on the MDOT Electronic Traffic Control Device Guidelines (2017). The existing condition traffic models were developed to reflect actual field conditions prior to analysis of the proposed conditions. Dummy intersections were used in existing and future conditions to balance the volumes between the study intersections based on MDOT Electronic Traffic Control Guidelines. The SimTraffic models were used to evaluate queues at the study intersections. SimTraffic queue lengths show the 95th percentile maximum queue lengths. The 95th percentile queue is

the maximum back of queue with 95th percentile traffic volumes. Adequate level of service is generally defined as LOS D or better.

4.1.2 Analysis Summary

A capacity analysis was completed to determine the impacts of the site generated traffic on the access, mobility, safety, and traffic operations at the proposed site and adjacent roadways. The capacity analysis was conducted for the study intersections for the following conditions during the AM and PM peaks:

- Existing 2022
- Future 2024 No-Build
- Future 2024 Build-Out
- Future 2024 Build-Out Mitigation

The Peak Hour Factor (PHF) provided by the turning movement counts was applied when modeling the 2022 Existing, 2024 No-Build, 2024 Build-Out, and 2024 Build-Out mitigation conditions. The HCM Synchro reports were generated to determine the LOS, delay, and 95th percentile queue length for each condition during each peak hour. There were no geometric improvements to the existing roadways. All site driveways are existing. The existing signal timings were used in the analysis for the 2022 Existing, 2024 No-Build, and 2024 Build-Out conditions. The timing for the signal at W. Centre Ave and Shaver Rd was modified for the 2024 Build-Out Mitigation condition. The existing timing permits were provided by the City of Portage. Timing permits can be found in **Appendix B**.

Tables 8 through 19 provide the results of the capacity analysis for the proposed development by condition, peak hour, and intersection turning movement. The Synchro HCM and SimTraffic reports used in this analysis are provided in **Appendix D**. Note that free flow thru traffic in unsignalized intersections typically does not have delay values and free flow right turn movements have minimal delay values. The LOS for these free flow movements can be assumed as LOS A with very minimal or no delays.

The existing drive at W. Centre Ave is approximately 21-22 feet wide, and existing traffic counts show that vehicles turn both left and right when exiting the site. The existing and proposed laneage for that driveway is separate right and left turn lanes for exiting traffic. The existing and proposed laneage for the South Site Driveway at Shaver Rd is separate right and left turn lanes for exiting traffic. The existing and proposed laneage for the North Site Driveway at Shaver Rd is a shared right and left turn lane for exiting traffic.

TABLE 8: W. CENTRE AVE AND SHAVER RD – LOS AND DELAYS

W. CENTRE AVE AND SHAVER RD - LOS and Delays (Sec)											
Condition		Eastbound			Westbound		Northbound		Southbound		TOTAL
		Left	Thru	Right	Left	Thru-Right	Left	Thru-Right	Left	Thru-Right	
AM Peak	2022 Existing	B 12.9	B 17.7	B 13.9	C 31.0	D 36.3	D 44.4	D 36.8	D 47.1	C 28.6	
	2024 No Build	B 13.2	B 17.9	B 14.2	C 31.6	D 36.2	D 44.5	D 36.6	D 47.0	C 28.9	
	2024 Build Out	B 13.7	B 18.7	B 15.0	C 32.2	D 35.8	D 44.3	D 35.8	D 46.5	C 29.5	
PM Peak	2022 Existing	C 22.5	C 23.4	B 18.4	D 41.1	F 130.4	E 61.0	C 34.7	F 84.7	D 54.1	
	2024 No Build	C 22.9	C 23.5	B 18.5	D 41.3	F 139.4	E 62.8	C 34.9	F 87.6	E 55.7	
	2024 Build Out	C 23.4	C 23.5	B 18.5	D 41.7	F 148.6	E 75.5	D 35.7	F 94.4	E 60.6	
	2024 Mitigation	C 28.0	C 25.0	C 20.4	D 43.2	F 98.6	E 55.5	C 33.4	E 72.8	D 49.9	

TABLE 9: W. CENTRE AVE AND SHAVER RD – QUEUES

W. CENTRE AVE AND SHAVER RD - Queue (ft)											
Condition		Eastbound			Westbound		Northbound		Southbound		
		Left	Thru	Right	Left	Thru-Right	Left	Thru-Right	Left	Thru-Right	
AM Peak	2022 Existing	44	220	122	242	87	145	33	111		
	2024 No Build	78	216	126	257	100	145	25	118		
	2024 Build Out	49	250	132	221	77	151	22	114		
PM Peak	2022 Existing	199	186	242	308	313	468	169	302		
	2024 No Build	125	192	258	312	290	378	160	323		
	2024 Build Out	166	191	271	320	360	607	170	312		
	2024 Mitigation	185	216	250	320	361	468	162	305		

W. Centre Ave and Shaver Rd (Tables 8 and 9)

- The intersection of W. Centre Ave and Shaver Rd operates at an acceptable LOS D or better during the AM peak hours for all conditions. During the PM peak hour, the intersection operates at an acceptable LOS D or better for all conditions except the northbound left (LOS F), northbound thru-right (LOS E), and the southbound thru-right (LOS F) movements.
- The existing LOS for northbound left turns for the PM peak hour is LOS F, and remains LOS F after the Build-Out, with an increase in delay of approximately 18.2 seconds.
- The existing LOS for the northbound thru-right movements for the PM peak hour is LOS E, and remains LOS E after the Build-Out, with an increase in delay of approximately 14.5 seconds.

- The existing LOS for the southbound thru-right movement is LOS F and remains LOS F after the Build-Out, with an increase in delay of approximately 9.7 seconds. The SB approach maximum queue extends beyond the site south driveway and the existing left turn storage lane.
- The eastbound right turn movement is channelized and controlled by a yield sign.
- Proposed mitigations to the signal timing and operation were evaluated to improve the northbound movements and the southbound thru-right movement. The mitigation model included adjustments to the signal timing splits (+1 sec for northbound/southbound left turn phase and +2 seconds for southbound/northbound phase; -1 sec for eastbound/westbound left turn phase and -2 sec for eastbound/westbound thru phase). The mitigated LOS and queue lengths are similar to existing conditions.

TABLE 10: SHAVER RD AND S. WESTNEDGE AVE – LOS/DELAYS

SHAVER RD AND S. WESTNEDGE AVE - LOS and Delays (Sec)										
Condition		Eastbound		Westbound		Northbound		Southbound		TOTAL
		Left-Thru	Thru-Right	Left-Thru	Right	Left	Thru-Right	Left	Thru-Right	
AM Peak	2022 Existing	C	C	C	D	B	B	A	A	B
		26.8	26.5	26.6	40.4	11.3	13.4	8.6	8.6	18.0
	2024 No Build	C	C	C	D	B	B	A	A	B
		26.9	26.5	26.6	40.4	11.5	13.6	8.7	8.8	18.2
PM Peak	2024 Build Out	C	C	C	D	B	B	A	A	B
		26.9	26.5	26.6	40.4	11.5	13.8	8.8	8.9	18.2
	2022 Existing	C	C	C	D	B	C	B	B	C
		27.4	27.4	27.7	45.7	15.8	20.4	13.3	12.6	21.0
	2024 No Build	C	C	C	D	B	C	B	B	C
		27.5	27.5	27.8	46.4	16.0	20.9	13.8	12.9	21.5
	2024 Build Out	C	C	C	D	B	C	B	B	C
		27.5	27.5	27.8	46.4	16.0	21.1	14.0	13.1	21.6

TABLE 11: SHAVER RD AND S. WESTNEDGE AVE – QUEUES

SHAVER RD AND S. WESTNEDGE AVE- Queue (ft)									
Condition		Eastbound		Westbound		Northbound		Southbound	
		Left-Thru	Thru-Right	Left-Thru	Right	Left	Thru-Right	Left	Thru-Right
AM Peak	2022 Existing	10	16	26	99	18	92	88	64
	2024 No Build	26	27	33	103	18	98	103	53
	2024 Build Out	5	25	31	125	19	93	97	59
PM Peak	2022 Existing	28	28	49	163	-	188	159	122
	2024 No Build	21	33	50	140	-	160	159	117
	2024 Build Out	12	39	56	197	15	161	166	133

Shaver Rd and S. Westnedge Ave (Tables 10 and 11)

- Shaver Rd and S. Westnedge operates at an acceptable level for all peak hours and conditions. The eastbound right turn movement operates with LOS D for all AM and PM conditions, while the rest of the intersection is at LOS C or better for all AM and PM conditions.
- Mitigation is not necessary for this intersection.

TABLE 12: W. CENTRE AVE AND S. WESTNEDGE AVE – LOS/DELAYS

W. CENTRE AVE S. WESTNEDGE AVE - LOS and Delays (Sec)											
Condition		Eastbound		Westbound		Northbound			Southbound		TOTAL
		Left	Thru-Right	Left	Thru-Right	Left	Thru	Right	Left	Thru-Right	
AM Peak	2022 Existing	C 27.8	D 46.6	D 41.7	C 28.6	C 31.4	C 34.8	D 52.0	C 27.8	D 39.0	D 38.7
	2024 No Build	C 28.0	D 47.1	D 42.0	C 28.7	C 31.6	C 34.8	D 52.7	C 28.0	D 39.4	D 39.0
	2024 Build Out	C 28.0	D 47.9	D 42.5	C 28.8	C 31.6	C 34.8	D 52.7	C 28.0	D 39.4	D 39.4
PM Peak	2022 Existing	D 42.0	D 54.5	E 57.6	D 39.3	D 35.5	D 40.2	D 45.0	C 29.3	D 52.2	D 46.0
	2024 No Build	D 42.5	E 55.1	E 58.9	D 39.8	D 35.7	D 40.2	D 45.3	C 29.4	D 52.7	D 46.5
	2024 Build Out	D 42.8	E 56.6	E 59.2	D 40.3	D 36.0	D 40.2	D 45.3	C 29.8	D 52.7	D 47.2

TABLE 13: W. CENTRE AVE AND S. WESTNEDGE AVE – QUEUES

W. CENTRE AVE S. WESTNEDGE AVE - Queue (ft)										
Condition		Eastbound		Westbound		Northbound			Southbound	
		Left	Thru-Right	Left	Thru-Right	Left	Thru	Right	Left	Thru-Right
AM Peak	2022 Existing	90	287	122	199	133	102	115	146	117
	2024 No Build	32	282	122	190	138	142	90	97	142
	2024 Build Out	25	295	104	181	140	172	118	127	88
PM Peak	2022 Existing	80	324	185	240	121	106	96	134	159
	2024 No Build	134	322	222	334	134	154	102	152	178
	2024 Build Out	44	339	197	267	133	183	127	173	199

W. Centre Ave and S. Westnedge Ave (Tables 12 and 13)

- W. Centre Ave and S. Westnedge Ave operates at an acceptable LOS D or better during the AM peak hours for all conditions. During the PM peak hour, the intersection operates at an acceptable LOS D or better for all conditions except the eastbound thru-right movement (LOS D and E) and the westbound left turn movement (LOS E).
- The eastbound thru-right movement is a high LOS D in the existing condition and increases by approximately 2.1 seconds of delay to LOS E for the Build-Out condition.

- The westbound left turn movement is a LOS E in the existing condition and remains a LOS E for the No-Build and proposed Build-Out conditions with an increase in delay of approximately 1.6 seconds. The proposed Build-Out does not add any traffic to this movement.
- Mitigation is not necessary for this intersection.

TABLE 14: SHAVER RD AND NORTH SITE DRIVEWAY – LOS/DELAYS

SHAVER RD AND NORTH SITE DRIVEWAY - LOS and Delays (Sec)					
Condition		Eastbound	Northbound		Southbound
		Left-Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	A 9.2	A 7.9	-	-
	2024 No Build	A 9.2	A 7.9	-	-
	2024 Build Out	B 10.1	A 7.9	-	-
PM Peak	2022 Existing	B 11	A 9.6	-	-
	2024 No Build	B 11.1	A 9.7	-	-
	2024 Build Out	B 13.4	A 9.8	-	-

TABLE 15: SHAVER RD AND NORTH SITE DRIVEWAY – QUEUES

SHAVER RD AND NORTH SITE DRIVEWAY - Queue (ft)					
Condition		Eastbound	Northbound		Southbound
		Left-Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	43	28	-	-
	2024 No Build	36	24	-	-
	2024 Build Out	49	18	-	-
PM Peak	2022 Existing	30	47	-	-
	2024 No Build	31	45	-	-
	2024 Build Out	36	45	-	-

Shaver Rd and North Site Driveway (Tables 14 and 15)

- The intersection of Shaver Rd and the North Site Driveway operates well for all peak hours and conditions (LOS B or better for all approaches).
- The proposed driveway operates at LOS B or better for both the AM and PM peak hours with minimal queue lengths (approximately 3 vehicles).
- The northbound left turn traffic entering the north driveway has minimal queues (approximately 3 vehicles), which will not exceed the available left turn lane storage.

TABLE 16: SHAVER RD AND SOUTH SITE DRIVEWAY – LOS/DELAYS

SHAVER RD AND SOUTH SITE DRIVEWAY - LOS and Delays (Sec)						
Condition		Eastbound		Northbound		Southbound
		Left	Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	B 11.4	A 9.3	A 8	-	-
	2024 No Build	B 11.5	A 9.3	A 8	-	-
	2024 Build Out	B 12	A 9.5	A 8.1	-	-
PM Peak	2022 Existing	C 18.3	B 12	A 9.7	-	-
	2024 No Build	C 18.7	B 12.1	A 9.8	-	-
	2024 Build Out	C 20.1	B 12.5	A 10	-	-

TABLE 17: SHAVER RD AND SOUTH SITE DRIVEWAY – QUEUES

SHAVER RD AND SOUTH SITE DRIVEWAY - Queue (ft)						
Condition		Eastbound		Northbound		Southbound
		Left	Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	31	31	-	-	-
	2024 No Build	10	24	-	-	-
	2024 Build Out	43	38	18	-	-
PM Peak	2022 Existing	33	51	14	-	45
	2024 No Build	61	48	16	-	70
	2024 Build Out	74	126	40	-	113

Shaver Rd and South Site Driveway (Tables 16 and 17)

- The intersection of Shaver Rd and the South Site Driveway operates at an acceptable LOS C or better for all peak hours and conditions.
- The proposed driveway operates at LOS C or better for both the AM and PM peak hours.
- The existing eastbound storage lengths are sufficient for the queue lengths based on modelling.
- The southbound thru-right movement has a queue length of 113 feet with the 2024 Build-Out conditions. This is mainly due to spillback from southbound approach queues at the Shaver Rd and Centre Rd intersection.
- The northbound left turn traffic entering the south driveway has minimal queues (approximately 2 vehicles), which has adequate left turn lane storage length.

TABLE 18: W. CENTRE AVE AND SITE DRIVEWAY – LOS/DELAYS

W. CENTRE AVE AND SITE DRIVEWAY - LOS and Delays (Sec)						
Condition		Eastbound		Westbound	Southbound	
		Left	Thru	Thru-Right	Left	Right
AM Peak	2022 Existing	A 1.0	-	-	B 14.3	A 9.2
	2024 No Build	A 1.0	-	-	B 14.5	A 9.33
	2024 Build Out	A 1.4	-	-	B 14.9	A 9.4
PM Peak	2022 Existing	A 3.2	-	-	C 17.9	A 9.9
	2024 No Build	A 3.3	-	-	C 12.7	A 9.9
	2024 Build Out	A 4.2	-	-	C 18.9	B 10.0

TABLE 19: CENTRE AVE AND SITE DRIVEWAY – QUEUES

W. CENTRE AVE AND SITE DRIVEWAY - Queue (ft)						
Condition		Eastbound		Westbound	Southbound	
		Left	Thru	Thru-Right	Left	Right
AM Peak	2022 Existing	49	-	-	-	46
	2024 No Build	46	-	-	10	45
	2024 Build Out	22	-	-	32	52
PM Peak	2022 Existing	83	-	-	42	50
	2024 No Build	81	-	-	65	50
	2024 Build Out	95	-	-	62	62

W. Centre Ave and Site Driveway (Tables 18 and 19)

- The intersection of W. Centre Ave and the Site Driveway operates at an acceptable LOS C or better for all peak hours and conditions.
- The proposed driveway operates at LOS C or better for both the AM and PM peak hours with minimal queue lengths (approximately 3 vehicles).
- The eastbound left turn traffic entering the W. Centre Ave driveway has queues up to approximately 95 feet maximum, which will not exceed the available left turn storage.

4.2 Turning Lane and Passing Flare Warrants

After reviewing the site generated trips, existing traffic, and background growth for the 2024 Build-Out, RSE completed an analysis to determine if right turn lanes or tapers or passing flares are warranted at the following locations:

- Shaver Rd and North Site Driveway
- Shaver Rd and South Site Driveway
- W. Centre Ave and Site Driveway

The City of Portage Contract Conditions and Specifications were used to evaluate the need for a right turn lane. All guidelines were reviewed at each location during the highest volume peak hour.

The City of Portage Contract Conditions and Specifications considers speed limit, number of lanes, average daily traffic on the main street, and right turns per hour to evaluate the need for a right turn lane. The speed limit on Shaver Rd is 35 mph. Since the specification only requires right turn lanes when the speed limit is more than 35 mph, the two driveways on Shaver Rd **do not meet** the warrants for a right turn lane. The City of Portage requirements for a right turn lane are shown in **Exhibit 10**.

EXHIBIT 10: RIGHT-TURN LANE WARRANT ANALYSIS

Right turn lanes should be provided when the speed limit is more than 35 mph and the average daily traffic of the main street is more than 10,000 vehicles per day and the number of right turning vehicles meets the criteria listed in Table 9.

Posted Speed > 45 mph		Posted Speed < 45 mph	
Number of Lanes	Right Turn Vehicles per hour	Number of Lanes	Right Turn Vehicles per hour
2	30	2	80
4	40	4	110

A left turn warrant analysis was **not necessary** for Shaver Rd and the South Site Driveway since there is an existing center left turn lane on Shaver Rd.

The speed limit on W. Centre Ave is 40 mph. Per MDOT's Transportation Data Management System website, the average daily traffic in the vicinity of the site is more than 10,000 vehicles per day. The maximum number of right turning vehicles per hour is 46 vehicles during the PM peak hour. Based on this data and **Exhibit 10** above, the driveway on W. Centre Rd **does not meet** the warrants for a right turn lane.

A left turn warrant analysis was **not necessary** for Shaver Rd and the South Site Driveway since there is an existing center left turn lane on Shaver Rd.

4.3 Sight Distance Analysis

RSE reviewed the site access points to determine if the required intersection sight distance will be adequate for the proposed driveways along Shaver Rd and W. Centre Ave. The sight distance was established based on the roadway speed and Tables 4 and 5 of the City of Portage Contract Conditions and Specifications Document. The speed for Shaver Rd is 35 mph, and the speed for W. Centre Ave is 40 mph.

Based on the aerial, the intersection sight distance at all sight access points appears to have no concerns with horizontal and vertical curves. The proposed sight triangles (red areas) need to remain clear of objects or any sight obstruction. The sight distance triangles and the proposed clear sight distance areas for the proposed driveways are shown on **Exhibits 11, 12, and 13**.

At 35 mph:
SSD = 250 feet, ISD = 360 feet

At 40 mph:
SSD = 305 feet, ISD = 410 feet

EXHIBIT 11: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND SOUTH SITE DRIVEWAY

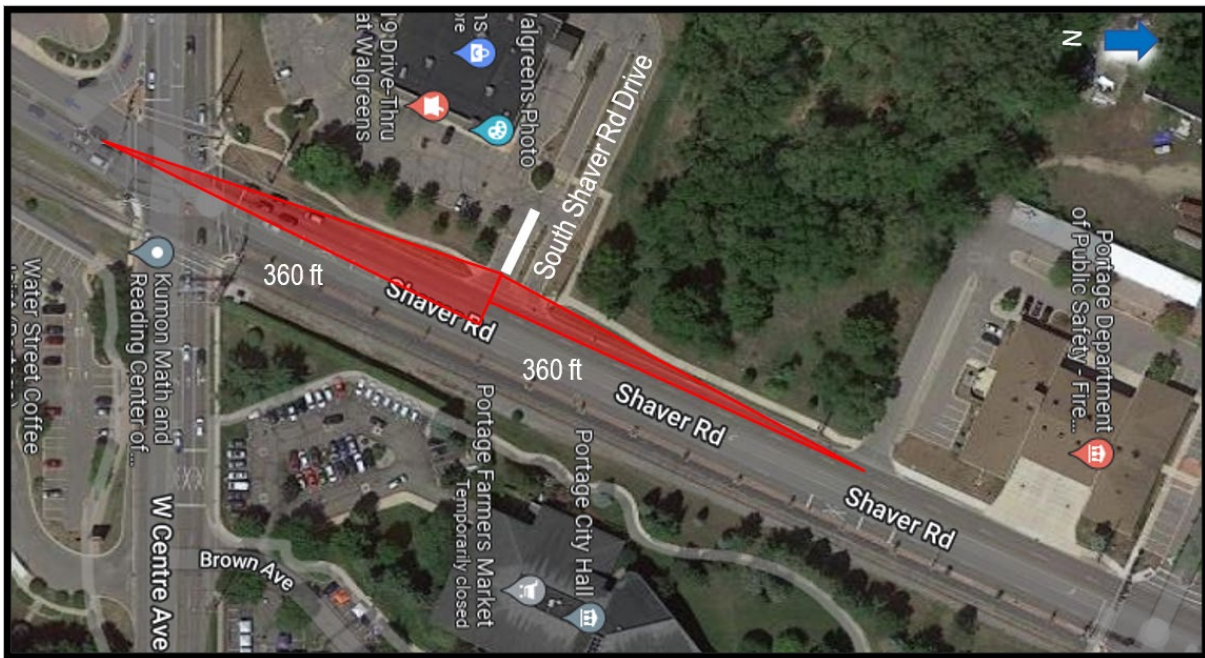


EXHIBIT 12: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND NORTH SITE DRIVEWAY

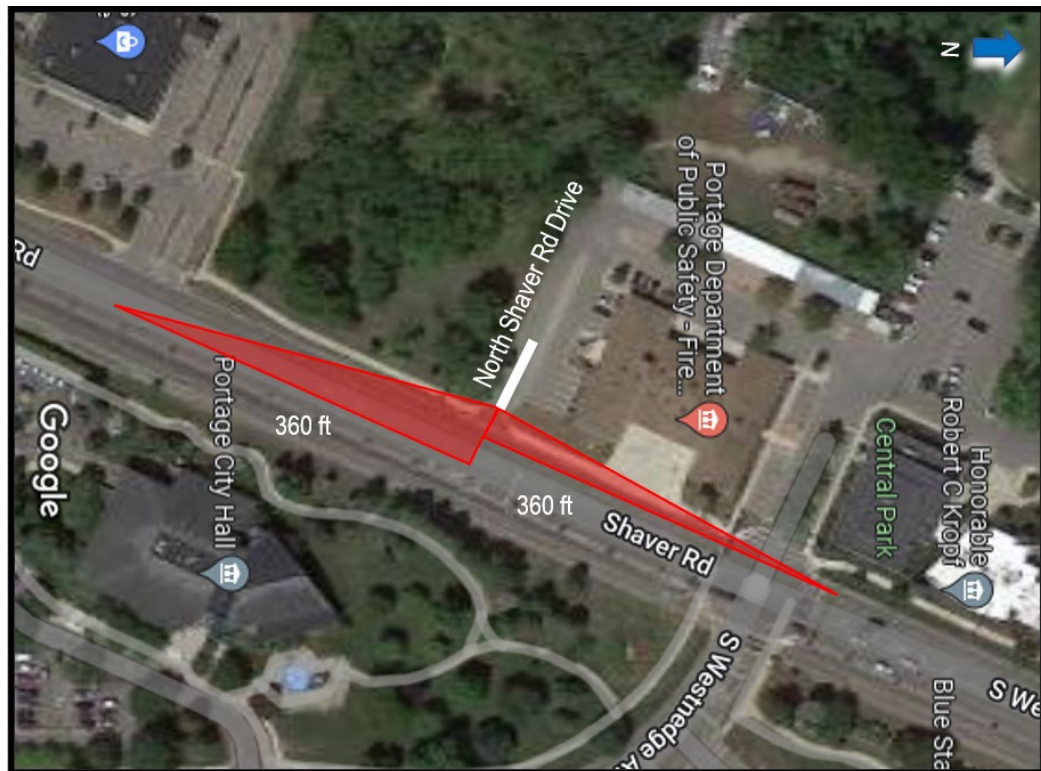
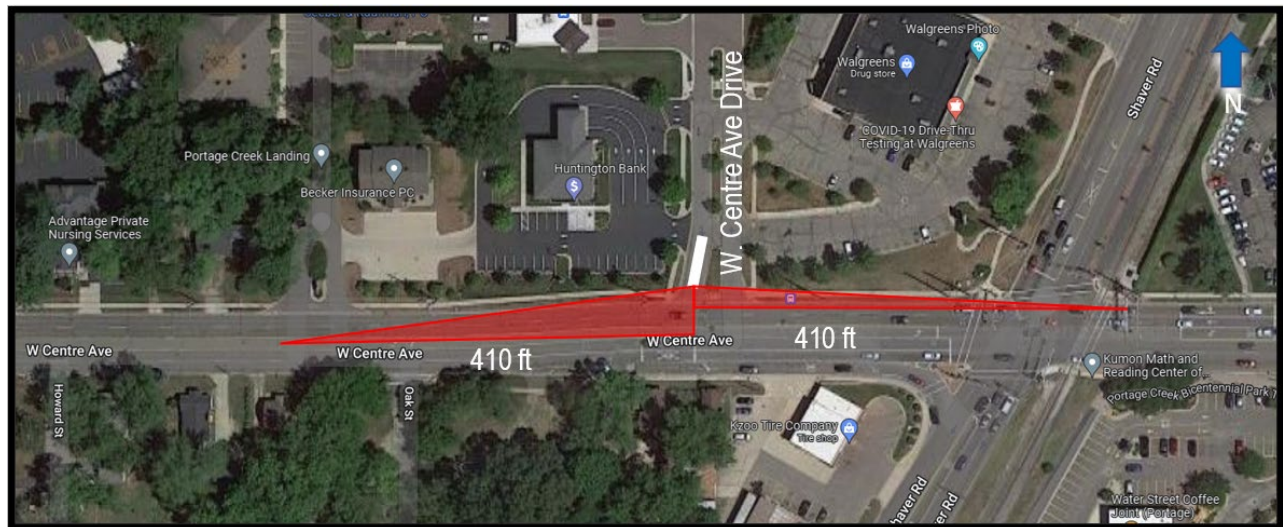


EXHIBIT 13: SIGHT DISTANCE TRIANGLE AT W. CENTRE AVE AND SITE DRIVEWAY



5 Conclusions and Recommendations

Based on the traffic data, the site plans, and the results of the traffic analysis presented herein, RSE has determined that adjacent roadways are expected to accommodate the proposed location of the Portage Creek multi-family housing and work-live development and its projected trip generations with some minor traffic operation and site access improvements. The analysis results and recommendations for the development are summarized below.

- a) All intersections/driveways operate at an acceptable LOS D or better during all peak periods for all conditions, with exception of the following:
 - The northbound left turn at W. Centre Ave and Shaver Rd during the PM peak hour.
 - The northbound thru-right movements at W. Centre Ave and Shaver Rd during the PM peak hour.
 - The southbound thru-right movement at W. Centre Ave and Shaver Rd during the PM peak hour.
 - The eastbound thru-right movement at W. Centre Ave and S. Westnedge Ave drops from LOS D to LOS E with the Build-Out condition during the PM peak hour with very minimal increase in delay (2 sec).
 - The westbound left turn movement at W. Centre Ave and S. Westnedge Ave during the PM peak hour (with 2 sec increase in delay). There are no proposed trips for this movement.
- b) Generally, there are minor increases in delays and queues from the 2022 Existing to the 2024 Build-Out conditions during each peak hour for most movements at the study intersections, while generally maintaining the existing LOS.
- c) The W. Centre Ave and Shaver Rd intersection operates with LOS E for the northbound thru-right movement and LOS F for the northbound left and southbound thru-right movements in the existing condition. The delay increases for these movements during the No-Build and Build-Out conditions.
 - A mitigated model was used to evaluate potential improvement for the PM peak hour including the Build-Out. Adjusting the timings and splits (+1 sec for northbound/southbound left turn phase and +2 seconds for southbound/northbound phase; -1 sec for eastbound/westbound left turn phase and -2 sec for eastbound/westbound thru phase) improves the Build-Out LOS and delay similar to existing conditions.
- d) Right turn lanes warrants
 - None of the driveways met the City of Portage requirements for a right turn lane.
- e) Left turn lanes/taper warrants
 - Left turn warrant analysis was not necessary for any of the driveways due to the presence of center left turn lanes on both Shaver Rd and W. Centre Ave.
- f) Separate right and left turn exit lanes are recommended for the driveway on W. Center Ave. This is per the existing driveway/intersection operations, as demonstrated by the existing counts. Separate right and left turn exit lanes are recommended for the South Shaver Drive and the North Shaver Drive is proposed to have a shared right/left turn exit lane, which both matches the existing conditions.

- g) As noted in the sight distance analysis section, it is recommended that the intersection quadrants within the sight triangle areas always remain clear of objects or any sight obstructions to provide adequate sight distance for the driveways.
- h) All existing intersection signal timings will be adequate of the 2024 Build-Out condition, except for the proposed timing adjustment at W. Centre Ave and Shaver Rd during the PM peak hour as noted below.
 - W. Centre Ave/Shaver Rd
 - Adjust signal timing for the northbound/southbound left turn phase from 14 seconds to 15 seconds.
 - Adjust signal timing for the northbound/southbound phase from 31 to 33 seconds.
 - Reduce signal timing for the eastbound/westbound left turn phase from 15 seconds to 14 seconds.
 - Reduce signal timing for the eastbound/westbound phase from 55 to 53 seconds.

The geometrics for the driveways and right turn tapers must follow the requirements of the City of Portage standards for commercial driveway openings for roadways with curbs and speeds of 35 mph (Shaver Ave) or 40 mph (Centre Ave) speed limit. All recommended improvements along W. Centre Ave and Shaver Rd should be considered as part of the Portage Creek multi-family housing development design and construction efforts, and should be designed according to the geometric, signing, and pavement marking design standards and guidelines of the City of Portage and the MMUTCD.

6 Bibliography

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Appendix A

SITE PLAN INFORMATION

	BLDG 36(5)	BLDG 24(1)	WK/LV (2)	TOTAL	NOTES
WORK/LIVE	-	-	8	-	980 SF
1 BR UNIT	24	24	8	-	152 3 SIZES
2 BR UNIT	12	0	8	-	68
	-	-	-	-	-
TOTAL	180	24	24	-	228

(2) WORK/LIVE	11,775 SF	23,550 SF
(5) BUILDING 36	32,895 SF	164,475 SF
(1) BUILDING 24	20,790 SF	20,790 SF
COMMUNITY BUILDING	3,350 SF	3,350 SF
TOTAL GSF		212,165 GSF
PARKING	368 SPACES (LESS ACCESSIBLE SPACES)	



Appendix B

EXISTING TRAFFIC DATA

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					W Centre Ave Westbound					Shaver Rd Northbound					W Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:00AM	10	36	6	0	52	0	88	23	0	111	33	34	20	0	87	18	156	12	0	186	436
7:15AM	13	43	6	0	62	0	189	28	0	217	35	60	29	0	124	33	249	32	0	314	717
7:30AM	11	50	0	0	61	4	222	35	0	261	19	47	25	0	91	25	173	19	0	217	630
7:45AM	28	44	4	0	76	4	124	36	0	164	17	61	18	0	96	38	151	18	0	207	543
Hourly Total	62	173	16	0	251	8	623	122	0	753	104	202	92	0	398	114	729	81	0	924	2326
8:00AM	17	36	7	0	60	4	101	39	0	144	32	66	17	0	115	35	134	17	0	186	505
8:15AM	23	51	7	0	81	3	126	28	0	157	23	54	28	0	105	36	117	23	0	176	519
8:30AM	24	33	12	0	69	7	135	38	0	180	25	66	27	0	118	28	131	21	0	180	547
8:45AM	22	47	8	0	77	4	133	28	0	165	27	46	25	0	98	39	112	42	0	193	533
Hourly Total	86	167	34	0	287	18	495	133	0	646	107	232	97	0	436	138	494	103	0	735	2104
4:00PM	35	160	11	0	206	3	191	51	0	245	72	112	53	0	237	61	134	49	0	244	932
4:15PM	37	129	23	0	189	6	206	45	0	257	48	90	47	0	185	57	150	52	0	259	890
4:30PM	31	102	19	0	152	10	187	43	0	240	60	97	45	0	202	57	135	42	0	234	828
4:45PM	27	116	6	0	149	6	184	41	0	231	34	93	37	0	164	43	165	47	0	255	799
Hourly Total	130	507	59	0	696	25	768	180	0	973	214	392	182	0	788	218	584	190	0	992	3449
5:00PM	52	130	12	0	194	7	181	39	0	227	61	105	54	0	220	67	134	47	0	248	889
5:15PM	43	132	17	0	192	8	200	43	0	251	46	92	52	0	190	54	187	34	0	275	908
5:30PM	31	108	7	0	146	5	160	44	0	209	51	80	49	0	180	42	129	43	0	214	749
5:45PM	25	101	15	0	141	4	116	30	0	150	41	85	25	0	151	44	119	34	0	197	639
Hourly Total	151	471	51	0	673	24	657	156	0	837	199	362	180	0	741	207	569	158	0	934	3185
Total	429	1318	160	0	1907	75	2543	591	0	3209	624	1188	551	0	2363	677	2376	532	0	3585	11064
% Approach	22.5%	69.1%	8.4%	0%	-	2.3%	79.2%	18.4%	0%	-	26.4%	50.3%	23.3%	0%	-	18.9%	66.3%	14.8%	0%	-	-
% Total	3.9%	11.9%	1.4%	0%	17.2%	0.7%	23.0%	5.3%	0%	29.0%	5.6%	10.7%	5.0%	0%	21.4%	6.1%	21.5%	4.8%	0%	32.4%	-
Lights and Motorcycles	426	1287	157	0	1870	73	2506	571	0	3150	617	1158	528	0	2303	664	2316	524	0	3504	10827
% Lights and Motorcycles	99.3%	97.6%	98.1%	0%	98.1%	97.3%	98.5%	96.6%	0%	98.2%	98.9%	97.5%	95.8%	0%	97.5%	98.1%	97.5%	98.5%	0%	97.7%	97.9%
Heavy	3	31	3	0	37	2	37	20	0	59	7	30	23	0	60	13	60	8	0	81	237
% Heavy	0.7%	2.4%	1.9%	0%	1.9%	2.7%	1.5%	3.4%	0%	1.8%	1.1%	2.5%	4.2%	0%	2.5%	1.9%	2.5%	1.5%	0%	2.3%	2.1%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

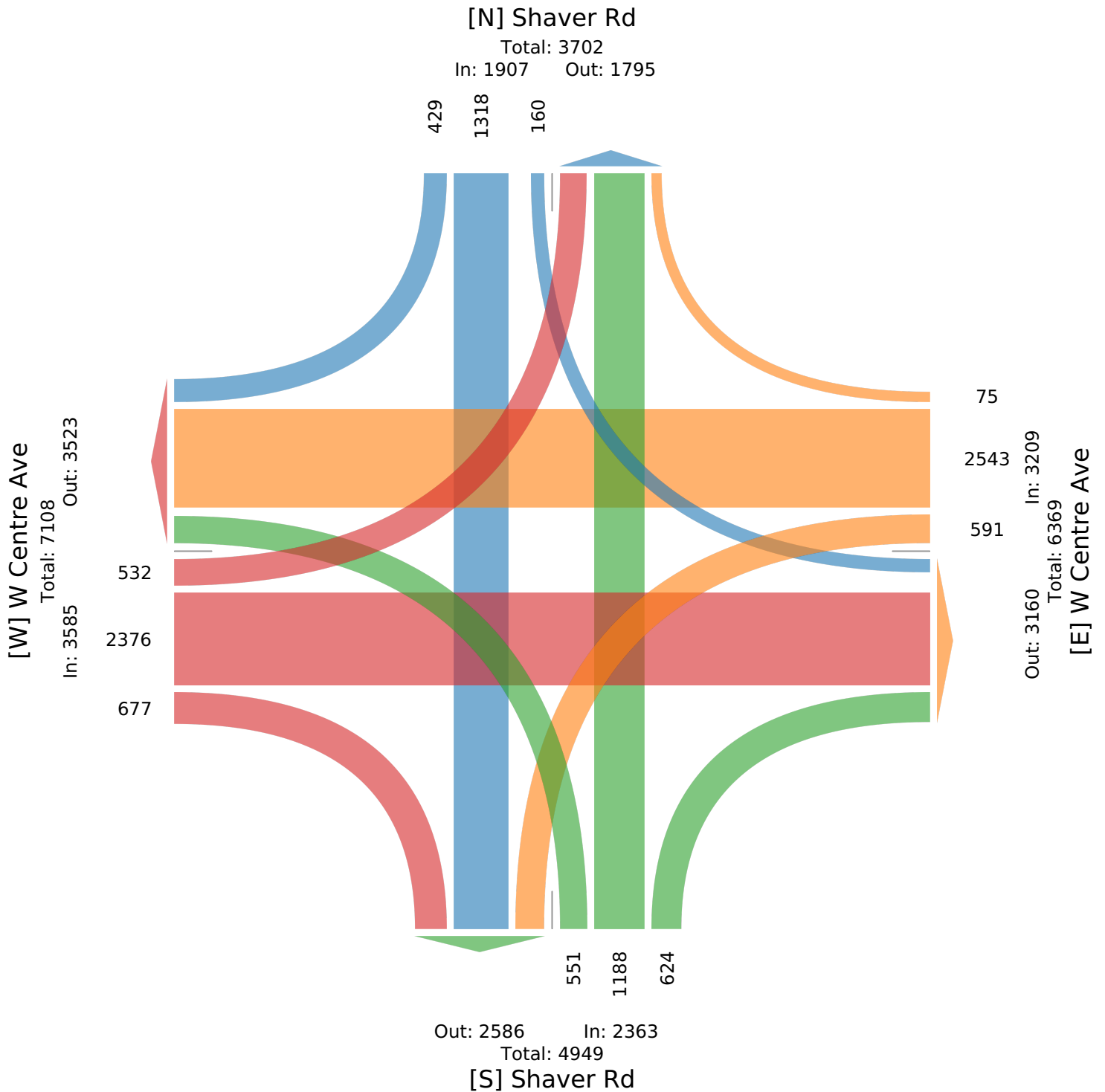
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					W Centre Ave Westbound					Shaver Rd Northbound					W Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:15AM	13	43	6	0	62	0	189	28	0	217	35	60	29	0	124	33	249	32	0	314	717
7:30AM	11	50	0	0	61	4	222	35	0	261	19	47	25	0	91	25	173	19	0	217	630
7:45AM	28	44	4	0	76	4	124	36	0	164	17	61	18	0	96	38	151	18	0	207	543
8:00AM	17	36	7	0	60	4	101	39	0	144	32	66	17	0	115	35	134	17	0	186	505
Total	69	173	17	0	259	12	636	138	0	786	103	234	89	0	426	131	707	86	0	924	2395
% Approach	26.6%	66.8%	6.6%	0%	-	1.5%	80.9%	17.6%	0%	-	24.2%	54.9%	20.9%	0%	-	14.2%	76.5%	9.3%	0%	-	-
% Total	2.9%	7.2%	0.7%	0%	10.8%	0.5%	26.6%	5.8%	0%	32.8%	4.3%	9.8%	3.7%	0%	17.8%	5.5%	29.5%	3.6%	0%	38.6%	-
PHF	0.616	0.865	0.607	-	0.852	0.750	0.716	0.885	-	0.753	0.736	0.886	0.767	-	0.859	0.862	0.710	0.672	-	0.736	0.835
Lights and Motorcycles	69	167	16	0	252	12	620	133	0	765	101	225	80	0	406	128	696	84	0	908	2331
% Lights and Motorcycles	100%	96.5%	94.1%	0%	97.3%	100%	97.5%	96.4%	0%	97.3%	98.1%	96.2%	89.9%	0%	95.3%	97.7%	98.4%	97.7%	0%	98.3%	97.3%
Heavy	0	6	1	0	7	0	16	5	0	21	2	9	9	0	20	3	11	2	0	16	64
% Heavy	0%	3.5%	5.9%	0%	2.7%	0%	2.5%	3.6%	0%	2.7%	1.9%	3.8%	10.1%	0%	4.7%	2.3%	1.6%	2.3%	0%	1.7%	2.7%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Shaver Rd

Total: 591

In: 259 Out: 332

69 173 17

[W] W Centre Ave
Total: 1718
In: 924 Out: 794

86
707
131

12
636
138

Out: 827 In: 786
Total: 1613
[E] W Centre Ave

Out: 442 In: 426
Total: 868

[S] Shaver Rd

89 234 103

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					W Centre Ave Westbound					Shaver Rd Northbound					W Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 4:00PM	35	160	11	0	206	3	191	51	0	245	72	112	53	0	237	61	134	49	0	244	932
4:15PM	37	129	23	0	189	6	206	45	0	257	48	90	47	0	185	57	150	52	0	259	890
4:30PM	31	102	19	0	152	10	187	43	0	240	60	97	45	0	202	57	135	42	0	234	828
4:45PM	27	116	6	0	149	6	184	41	0	231	34	93	37	0	164	43	165	47	0	255	799
Total	130	507	59	0	696	25	768	180	0	973	214	392	182	0	788	218	584	190	0	992	3449
% Approach	18.7%	72.8%	8.5%	0%	-	2.6%	78.9%	18.5%	0%	-	27.2%	49.7%	23.1%	0%	-	22.0%	58.9%	19.2%	0%	-	-
% Total	3.8%	14.7%	1.7%	0%	20.2%	0.7%	22.3%	5.2%	0%	28.2%	6.2%	11.4%	5.3%	0%	22.8%	6.3%	16.9%	5.5%	0%	28.8%	-
PHF	0.878	0.792	0.641	-	0.845	0.625	0.932	0.882	-	0.946	0.743	0.875	0.858	-	0.831	0.893	0.885	0.913	-	0.958	0.925
Lights and Motorcycles	130	501	58	0	689	25	763	177	0	965	211	389	179	0	779	216	558	188	0	962	3395
% Lights and Motorcycles	100%	98.8%	98.3%	0%	99.0%	100%	99.3%	98.3%	0%	99.2%	98.6%	99.2%	98.4%	0%	98.9%	99.1%	95.5%	98.9%	0%	97.0%	98.4%
Heavy	0	6	1	0	7	0	5	3	0	8	3	3	3	0	9	2	26	2	0	30	54
% Heavy	0%	1.2%	1.7%	0%	1.0%	0%	0.7%	1.7%	0%	0.8%	1.4%	0.8%	1.6%	0%	1.1%	0.9%	4.5%	1.1%	0%	3.0%	1.6%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

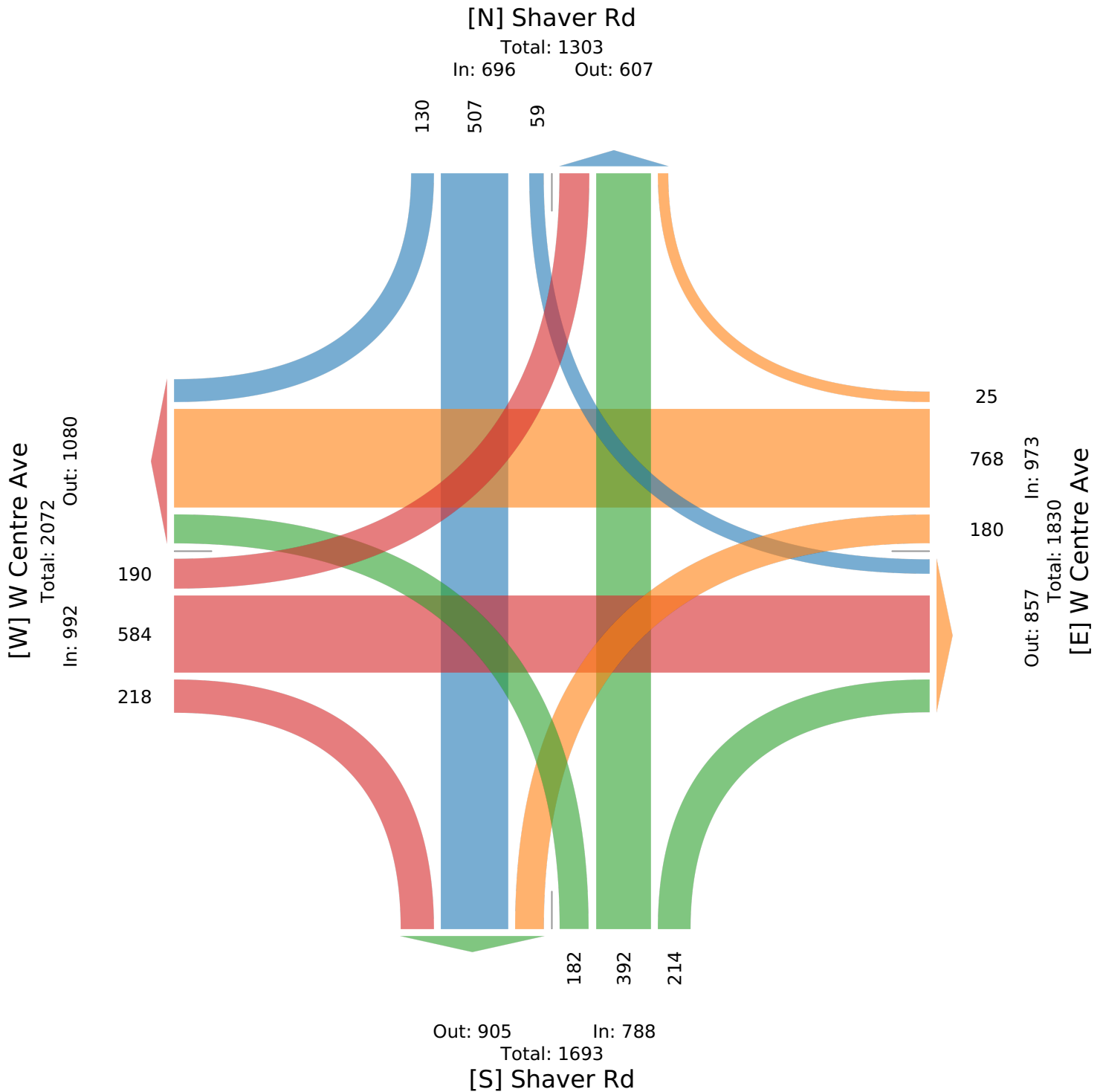
PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

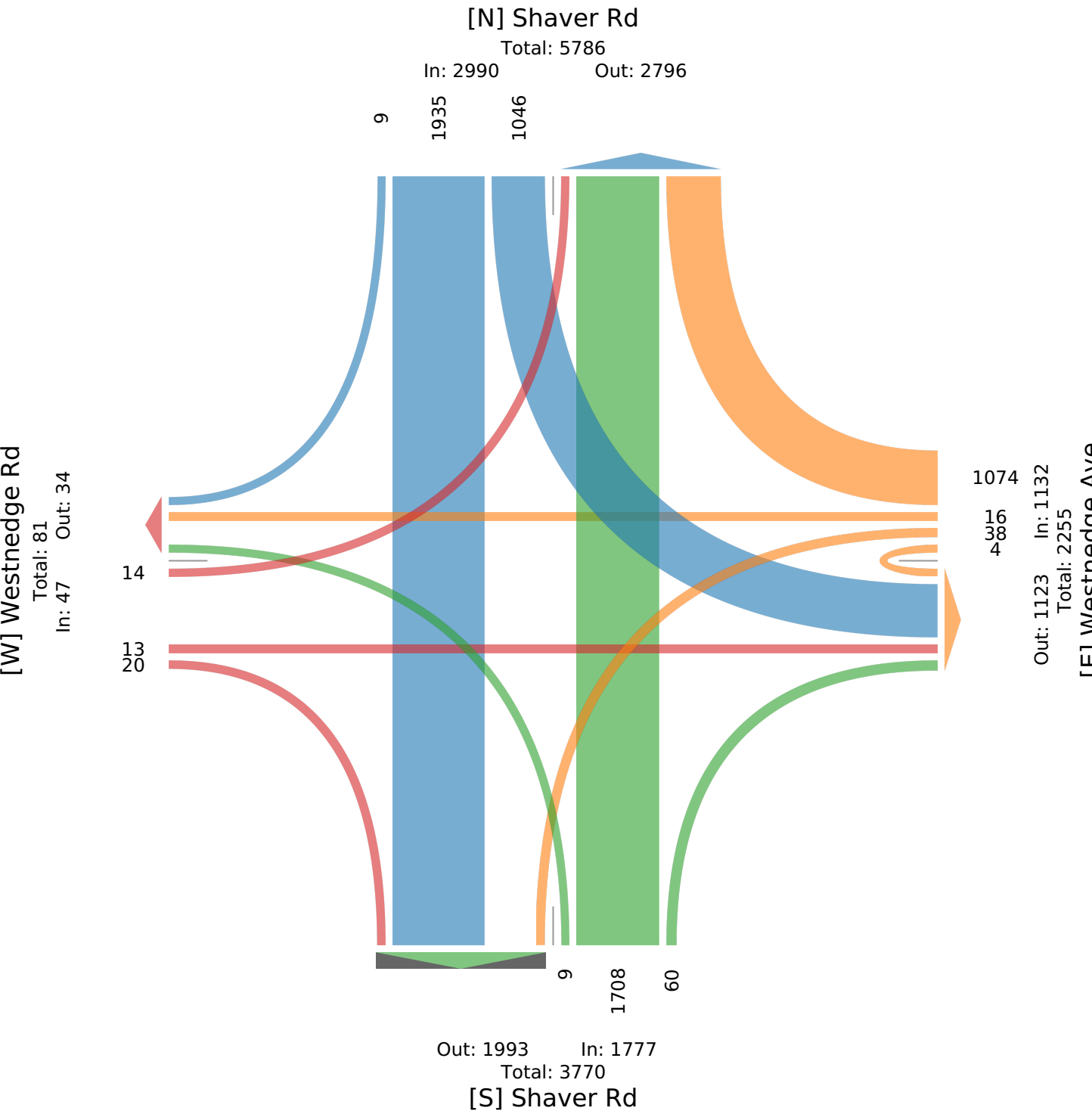
Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					Westnedge Ave Westbound					Shaver Rd Northbound					Westnedge Rd Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:00AM	0	56	54	0	110	32	1	0	0	33	2	43	0	0	45	2	1	3	0	6	194
7:15AM	3	60	91	0	154	82	1	2	0	85	18	69	1	0	88	1	0	0	0	1	328
7:30AM	0	67	51	0	118	75	1	1	1	78	4	68	1	0	73	1	0	0	0	1	270
7:45AM	2	80	44	0	126	43	1	1	0	45	3	75	1	0	79	0	0	0	0	0	250
Hourly Total	5	263	240	0	508	232	4	4	1	241	27	255	3	0	285	4	1	3	0	8	1042
8:00AM	1	56	43	0	100	40	0	1	0	41	6	82	0	0	88	0	0	1	0	1	230
8:15AM	1	79	47	0	127	49	1	1	0	51	0	77	0	0	77	2	1	0	0	3	258
8:30AM	0	73	47	0	120	54	0	0	0	54	2	91	0	0	93	0	1	1	0	2	269
8:45AM	0	82	47	0	129	59	1	1	0	61	5	85	1	0	91	0	0	1	0	1	282
Hourly Total	2	290	184	0	476	202	2	3	0	207	13	335	1	0	349	2	2	3	0	7	1039
4:00PM	0	218	67	0	285	74	1	4	1	80	6	151	0	0	157	3	1	2	0	6	528
4:15PM	0	184	82	0	266	71	2	0	0	73	3	154	2	0	159	0	0	2	0	2	500
4:30PM	1	157	71	0	229	88	2	4	0	94	4	126	1	0	131	1	1	1	0	3	457
4:45PM	0	142	89	0	231	99	0	5	2	106	2	148	0	0	150	4	3	1	0	8	495
Hourly Total	1	701	309	0	1011	332	5	13	3	353	15	579	3	0	597	8	5	6	0	19	1980
5:00PM	1	193	87	0	281	89	0	4	0	93	2	145	0	0	147	3	2	2	0	7	528
5:15PM	0	196	100	0	296	68	2	6	0	76	2	133	1	0	136	1	2	0	0	3	511
5:30PM	0	154	72	0	226	78	3	4	0	85	1	130	0	0	131	0	1	0	0	1	443
5:45PM	0	138	54	0	192	73	0	4	0	77	0	131	1	0	132	2	0	0	0	2	403
Hourly Total	1	681	313	0	995	308	5	18	0	331	5	539	2	0	546	6	5	2	0	13	1885
Total	9	1935	1046	0	2990	1074	16	38	4	1132	60	1708	9	0	1777	20	13	14	0	47	5946
% Approach	0.3%	64.7%	35.0%	0%	-	94.9%	1.4%	3.4%	0.4%	-	3.4%	96.1%	0.5%	0%	-	42.6%	27.7%	29.8%	0%	-	-
% Total	0.2%	32.5%	17.6%	0%	50.3%	18.1%	0.3%	0.6%	0.1%	19.0%	1.0%	28.7%	0.2%	0%	29.9%	0.3%	0.2%	0.2%	0%	0.8%	-
Lights and Motorcycles	9	1901	1018	0	2928	1058	15	38	4	1115	60	1668	9	0	1737	17	13	14	0	44	5824
% Lights and Motorcycles	100%	98.2%	97.3%	0%	97.9%	98.5%	93.8%	100%	100%	98.5%	100%	97.7%	100%	0%	97.7%	85.0%	100%	100%	0%	93.6%	97.9%
Heavy	0	34	28	0	62	16	1	0	0	17	0	40	0	0	40	3	0	0	0	3	122
% Heavy	0%	1.8%	2.7%	0%	2.1%	1.5%	6.3%	0%	0%	1.5%	0%	2.3%	0%	0%	2.3%	15.0%	0%	0%	0%	6.4%	2.1%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC
Tue Dec 6, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

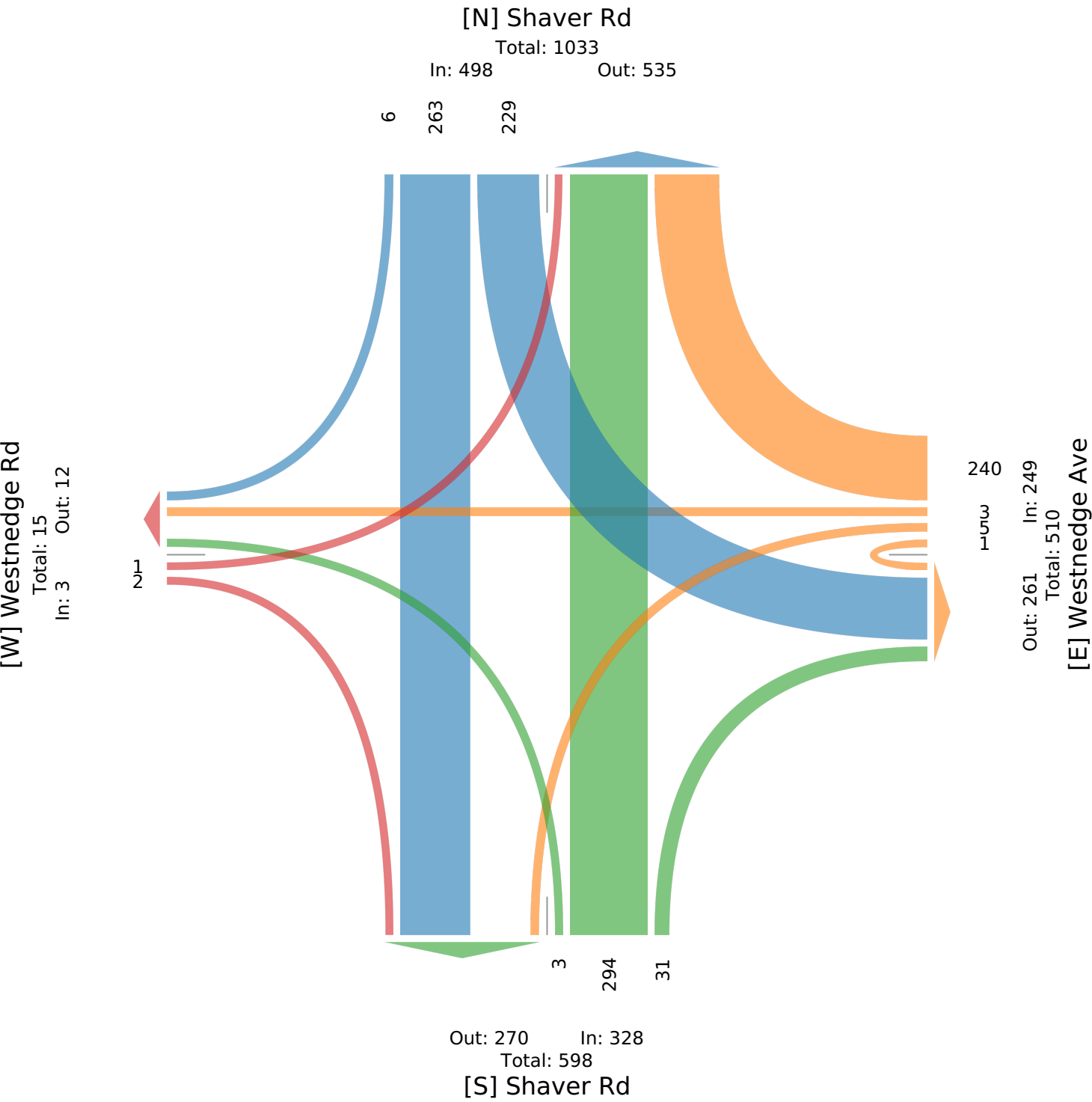
Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					Westnedge Ave Westbound					Shaver Rd Northbound					Westnedge Rd Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:15AM	3	60	91	0	154	82	1	2	0	85	18	69	1	0	88	1	0	0	0	1	328
7:30AM	0	67	51	0	118	75	1	1	1	78	4	68	1	0	73	1	0	0	0	1	270
7:45AM	2	80	44	0	126	43	1	1	0	45	3	75	1	0	79	0	0	0	0	0	250
8:00AM	1	56	43	0	100	40	0	1	0	41	6	82	0	0	88	0	0	1	0	1	230
Total	6	263	229	0	498	240	3	5	1	249	31	294	3	0	328	2	0	1	0	3	1078
% Approach	1.2%	52.8%	46.0%	0%	-	96.4%	1.2%	2.0%	0.4%	-	9.5%	89.6%	0.9%	0%	-	66.7%	0%	33.3%	0%	-	-
% Total	0.6%	24.4%	21.2%	0%	46.2%	22.3%	0.3%	0.5%	0.1%	23.1%	2.9%	27.3%	0.3%	0%	30.4%	0.2%	0%	0.1%	0%	0.3%	-
PHF	0.500	0.822	0.629	-	0.808	0.732	0.750	0.625	0.250	0.732	0.431	0.896	0.750	-	0.932	0.500	-	0.250	-	0.750	0.822
Lights and Motorcycles	6	255	220	0	481	233	3	5	1	242	31	282	3	0	316	1	0	1	0	2	1041
% Lights and Motorcycles	100%	97.0%	96.1%	0%	96.6%	97.1%	100%	100%	100%	97.2%	100%	95.9%	100%	0%	96.3%	50.0%	0%	100%	0%	66.7%	96.6%
Heavy	0	8	9	0	17	7	0	0	0	7	0	12	0	0	12	1	0	0	0	1	37
% Heavy	0%	3.0%	3.9%	0%	3.4%	2.9%	0%	0%	0%	2.8%	0%	4.1%	0%	0%	3.7%	50.0%	0%	0%	0%	33.3%	3.4%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC
Tue Dec 6, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					Westnedge Ave Westbound					Shaver Rd Northbound					Westnedge Rd Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 4:30PM	1	157	71	0	229	88	2	4	0	94	4	126	1	0	131	1	1	1	0	3	457
4:45PM	0	142	89	0	231	99	0	5	2	106	2	148	0	0	150	4	3	1	0	8	495
5:00PM	1	193	87	0	281	89	0	4	0	93	2	145	0	0	147	3	2	2	0	7	528
5:15PM	0	196	100	0	296	68	2	6	0	76	2	133	1	0	136	1	2	0	0	3	511
Total	2	688	347	0	1037	344	4	19	2	369	10	552	2	0	564	9	8	4	0	21	1991
% Approach	0.2%	66.3%	33.5%	0%	-	93.2%	1.1%	5.1%	0.5%	-	1.8%	97.9%	0.4%	0%	-	42.9%	38.1%	19.0%	0%	-	-
% Total	0.1%	34.6%	17.4%	0%	52.1%	17.3%	0.2%	1.0%	0.1%	18.5%	0.5%	27.7%	0.1%	0%	28.3%	0.5%	0.4%	0.2%	0%	1.1%	-
PHF	0.500	0.878	0.868	-	0.876	0.869	0.500	0.792	0.250	0.870	0.625	0.932	0.500	-	0.940	0.563	0.667	0.500	-	0.656	0.943
Lights and Motorcycles	2	682	345	0	1029	343	4	19	2	368	10	545	2	0	557	9	8	4	0	21	1975
% Lights and Motorcycles	100%	99.1%	99.4%	0%	99.2%	99.7%	100%	100%	100%	99.7%	100%	98.7%	100%	0%	98.8%	100%	100%	100%	0%	100%	99.2%
Heavy	0	6	2	0	8	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	16
% Heavy	0%	0.9%	0.6%	0%	0.8%	0.3%	0%	0%	0%	0.3%	0%	1.3%	0%	0%	1.2%	0%	0%	0%	0%	0%	0.8%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

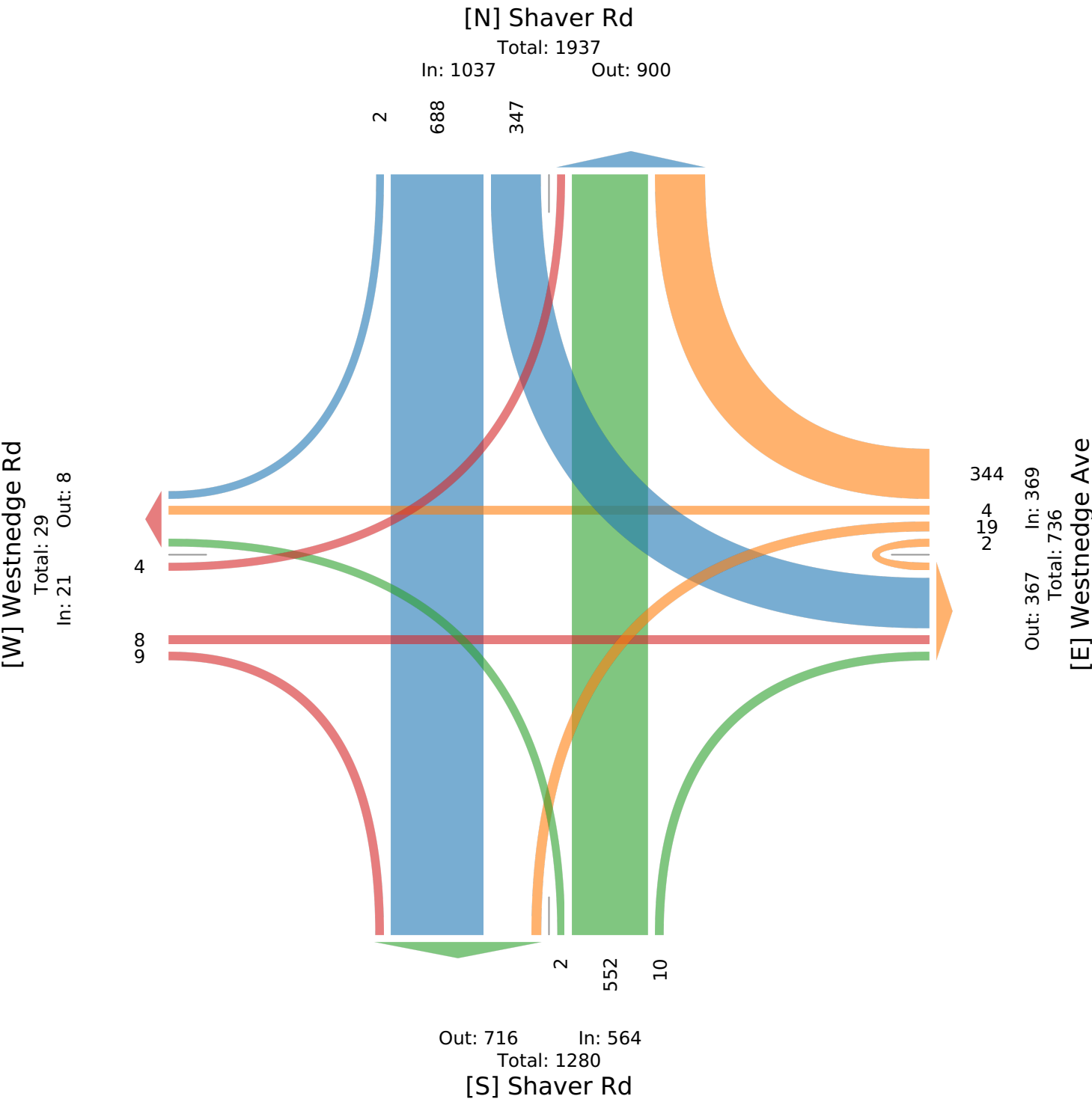
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Westnedge Ave Southbound					Centre Ave Westbound					Westnedge Ave Northbound					Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-08 7:00AM	1	32	28	0	61	10	79	22	0	111	25	25	27	0	77	40	121	0	0	161	410
7:15AM	0	40	43	0	83	19	124	49	0	192	50	46	58	0	154	41	228	2	0	271	700
7:30AM	1	31	19	0	51	9	180	25	0	214	61	53	62	0	176	30	183	4	0	217	658
7:45AM	1	13	17	0	31	14	136	15	0	165	33	29	27	0	89	16	174	6	0	196	481
Hourly Total	3	116	107	0	226	52	519	111	0	682	169	153	174	0	496	127	706	12	0	845	2249
8:00AM	1	24	13	0	38	16	109	23	0	148	21	37	28	0	86	19	114	2	0	135	407
8:15AM	0	12	13	0	25	13	125	54	0	192	30	31	27	0	88	17	133	7	1	158	463
8:30AM	1	13	23	0	37	19	123	29	0	171	35	28	43	0	106	9	113	3	0	125	439
8:45AM	1	19	21	0	41	11	128	20	0	159	16	24	26	0	66	14	139	14	0	167	433
Hourly Total	3	68	70	0	141	59	485	126	0	670	102	120	124	0	346	59	499	26	1	585	1742
4:00PM	7	48	33	0	88	30	205	35	0	270	37	39	35	0	111	30	179	5	0	214	683
4:15PM	3	34	29	0	66	31	172	45	0	248	27	31	30	0	88	33	162	8	0	203	605
4:30PM	3	44	21	0	68	22	206	35	0	263	29	34	29	0	92	37	184	4	0	225	648
4:45PM	3	33	32	0	68	29	188	43	0	260	27	39	23	0	89	36	183	9	0	228	645
Hourly Total	16	159	115	0	290	112	771	158	0	1041	120	143	117	0	380	136	708	26	0	870	2581
5:00PM	5	51	43	0	99	18	208	35	0	261	29	56	33	0	118	31	185	5	0	221	699
5:15PM	2	49	24	0	75	21	221	56	0	298	28	26	38	0	92	62	190	8	0	260	725
5:30PM	2	38	31	0	71	30	159	38	0	227	39	44	33	0	116	37	192	4	0	233	647
5:45PM	1	53	31	0	85	21	136	25	0	182	52	55	46	0	153	32	140	8	0	180	600
Hourly Total	10	191	129	0	330	90	724	154	0	968	148	181	150	0	479	162	707	25	0	894	2671
Total	32	534	421	0	987	313	2499	549	0	3361	539	597	565	0	1701	484	2620	89	1	3194	9243
% Approach	3.2%	54.1%	42.7%	0%	-	9.3%	74.4%	16.3%	0%	-	31.7%	35.1%	33.2%	0%	-	15.2%	82.0%	2.8%	0%	-	-
% Total	0.3%	5.8%	4.6%	0%	10.7%	3.4%	27.0%	5.9%	0%	36.4%	5.8%	6.5%	6.1%	0%	18.4%	5.2%	28.3%	1.0%	0%	34.6%	-
Lights and Motorcycles	28	523	404	0	955	312	2450	534	0	3296	519	583	557	0	1659	472	2550	89	1	3112	9022
% Lights and Motorcycles	87.5%	97.9%	96.0%	0%	96.8%	99.7%	98.0%	97.3%	0%	98.1%	96.3%	97.7%	98.6%	0%	97.5%	97.5%	97.3%	100%	100%	97.4%	97.6%
Heavy	4	11	17	0	32	1	49	15	0	65	20	14	8	0	42	12	70	0	0	82	221
% Heavy	12.5%	2.1%	4.0%	0%	3.2%	0.3%	2.0%	2.7%	0%	1.9%	3.7%	2.3%	1.4%	0%	2.5%	2.5%	2.7%	0%	0%	2.6%	2.4%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

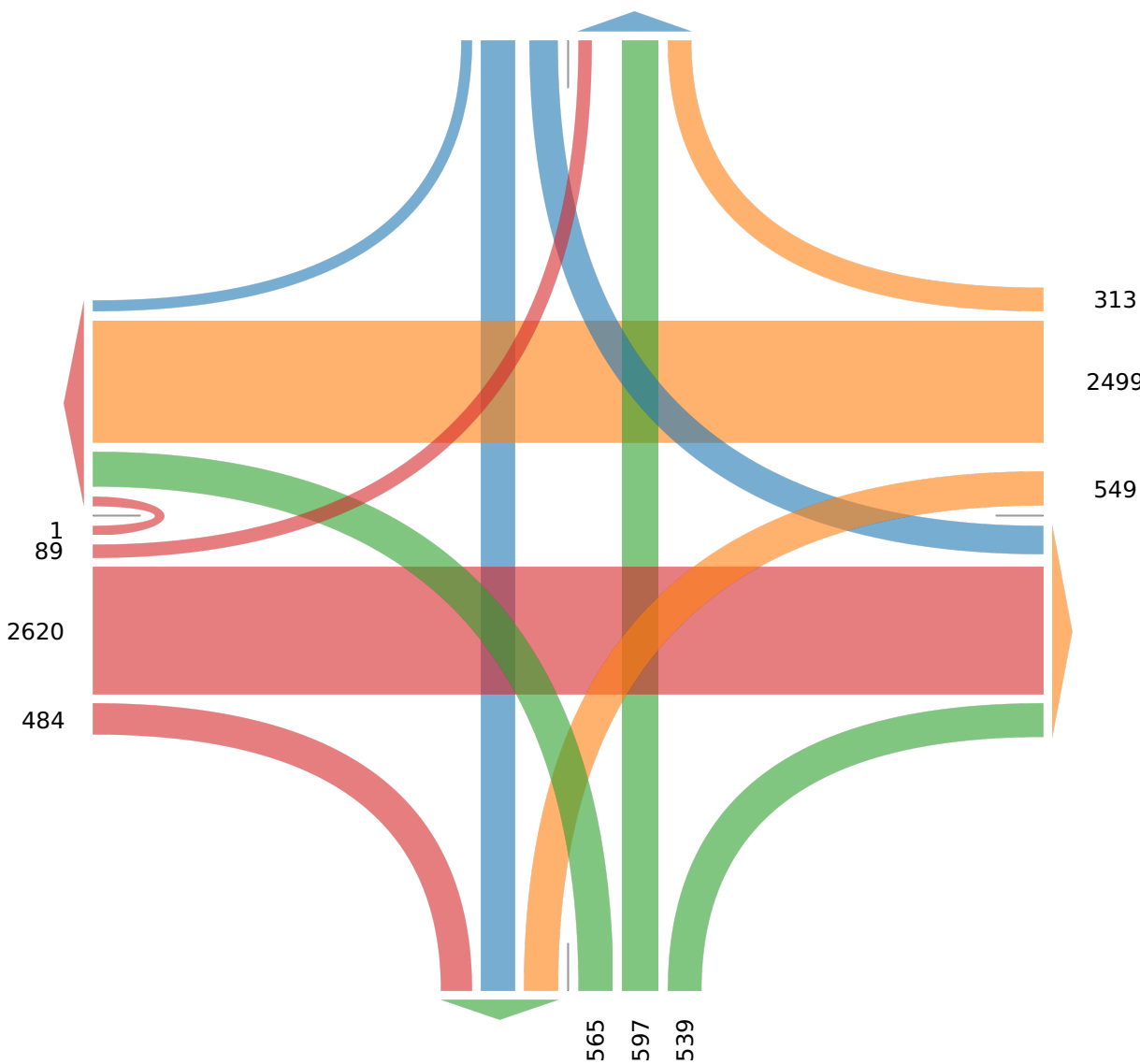
[N] Westnedge Ave

Total: 1986

In: 987 Out: 999

32
534
421

[W] Centre Ave
Total: 6291
In: 3194 Out: 3097



Out: 3580 In: 3361
Total: 6941
[E] Centre Ave

Out: 1567 In: 1701
Total: 3268
[S] Westnedge Ave

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Westnedge Ave Southbound					Centre Ave Westbound					Westnedge Ave Northbound					Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-08 7:00AM	1	32	28	0	61	10	79	22	0	111	25	25	27	0	77	40	121	0	0	161	410
7:15AM	0	40	43	0	83	19	124	49	0	192	50	46	58	0	154	41	228	2	0	271	700
7:30AM	1	31	19	0	51	9	180	25	0	214	61	53	62	0	176	30	183	4	0	217	658
7:45AM	1	13	17	0	31	14	136	15	0	165	33	29	27	0	89	16	174	6	0	196	481
Total	3	116	107	0	226	52	519	111	0	682	169	153	174	0	496	127	706	12	0	845	2249
% Approach	1.3%	51.3%	47.3%	0%	-	7.6%	76.1%	16.3%	0%	-	34.1%	30.8%	35.1%	0%	-	15.0%	83.6%	1.4%	0%	-	-
% Total	0.1%	5.2%	4.8%	0%	10.0%	2.3%	23.1%	4.9%	0%	30.3%	7.5%	6.8%	7.7%	0%	22.1%	5.6%	31.4%	0.5%	0%	37.6%	-
PHF	0.750	0.725	0.622	-	0.681	0.684	0.721	0.566	-	0.797	0.693	0.722	0.702	-	0.705	0.774	0.774	0.500	-	0.780	0.803
Lights and Motorcycles	2	111	104	0	217	52	504	105	0	661	161	149	170	0	480	121	697	12	0	830	2188
% Lights and Motorcycles	66.7%	95.7%	97.2%	0%	96.0%	100%	97.1%	94.6%	0%	96.9%	95.3%	97.4%	97.7%	0%	96.8%	95.3%	98.7%	100%	0%	98.2%	97.3%
Heavy	1	5	3	0	9	0	15	6	0	21	8	4	4	0	16	6	9	0	0	15	61
% Heavy	33.3%	4.3%	2.8%	0%	4.0%	0%	2.9%	5.4%	0%	3.1%	4.7%	2.6%	2.3%	0%	3.2%	4.7%	1.3%	0%	0%	1.8%	2.7%

*L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Westnedge Ave

Total: 443

In: 226 Out: 217

3
116
107

[W] Centre Ave

Total: 1541

In: 845 Out: 696

12
706
127

52
519
111

Out: 982 In: 682

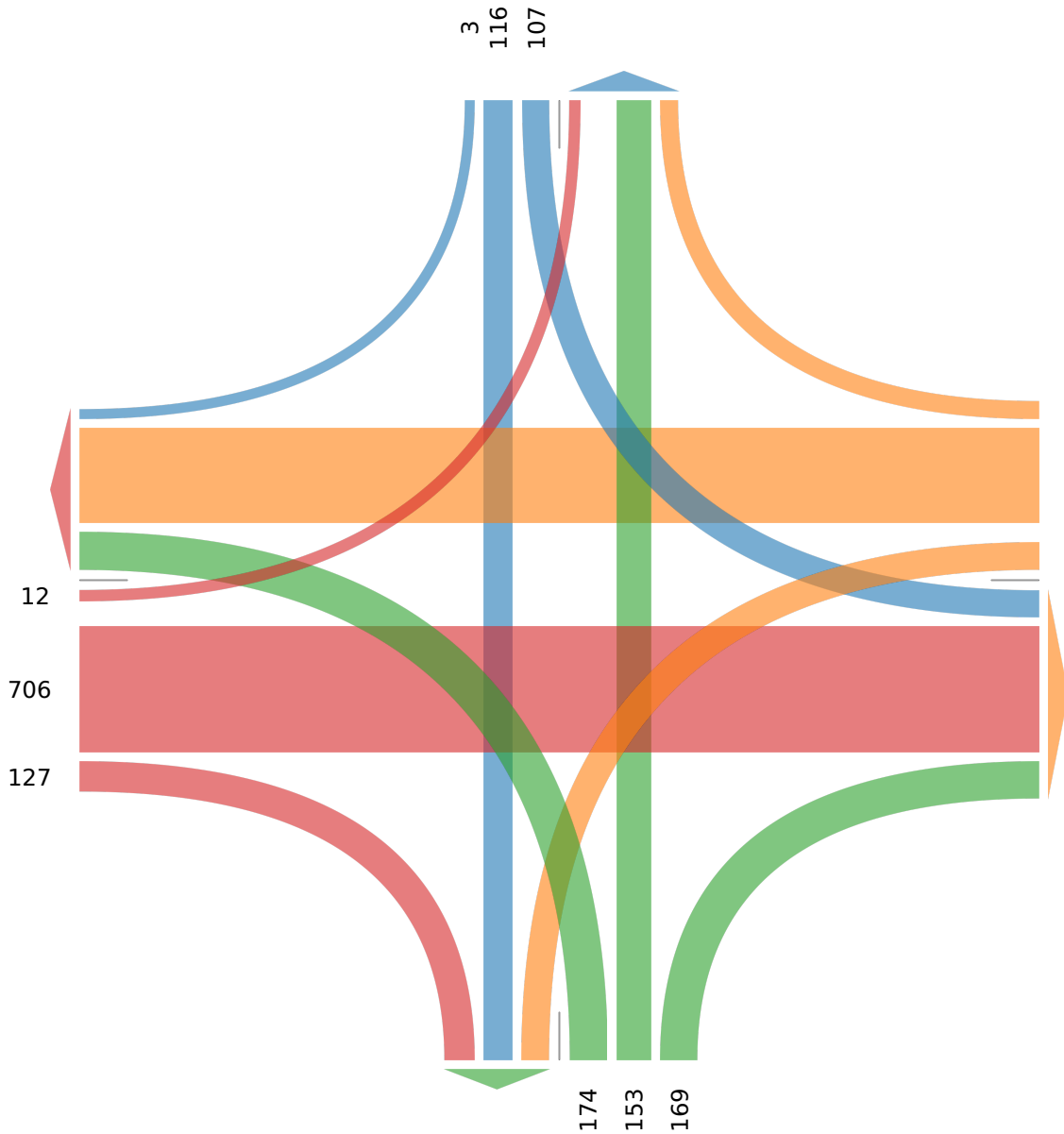
Total: 1664

[E] Centre Ave

Out: 354 In: 496
Total: 850

[S] Westnedge Ave

174
153
169



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

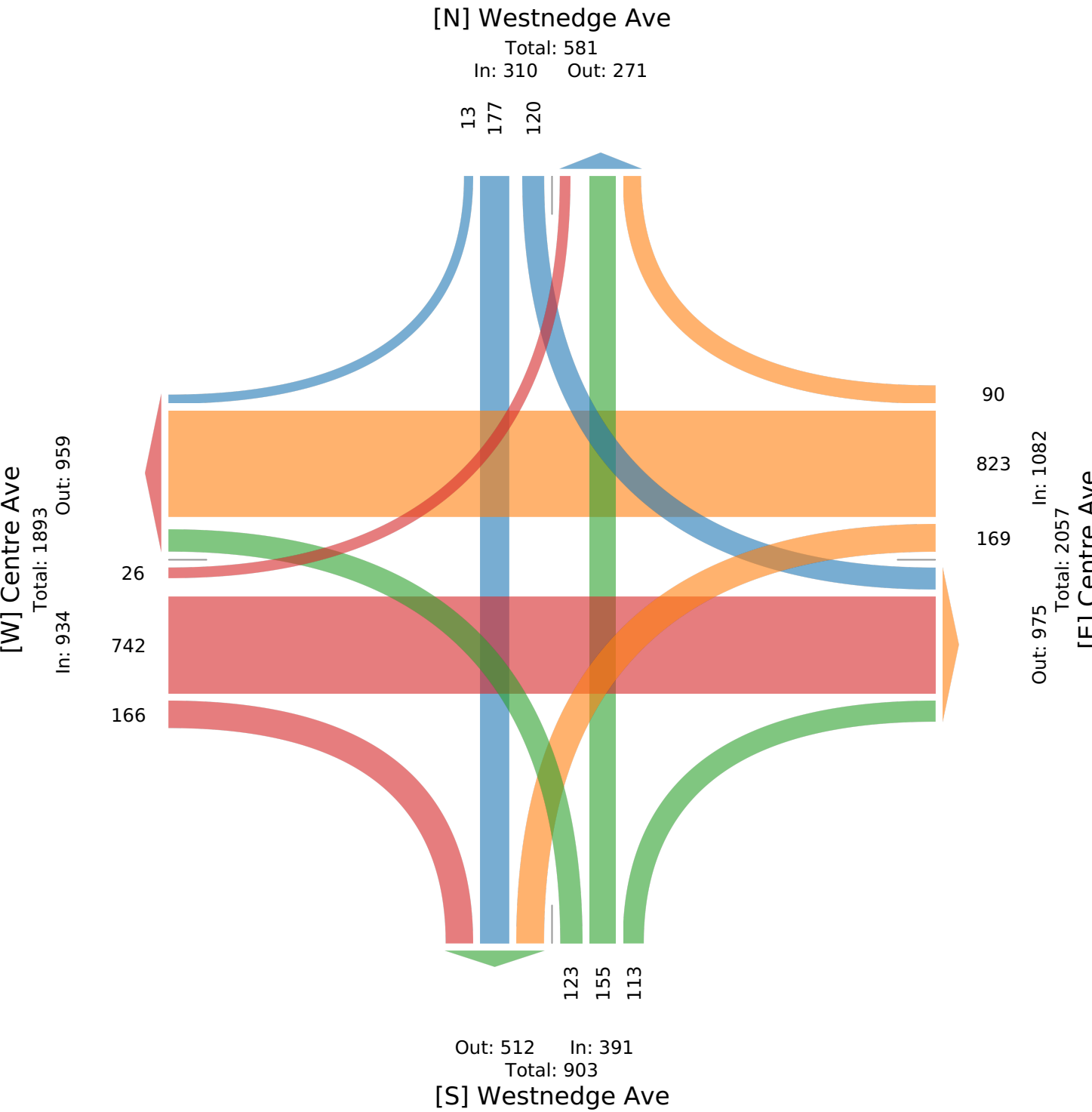
All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Westnedge Ave Southbound					Centre Ave Westbound					Westnedge Ave Northbound					Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-08 4:30PM	3	44	21	0	68	22	206	35	0	263	29	34	29	0	92	37	184	4	0	225	648
4:45PM	3	33	32	0	68	29	188	43	0	260	27	39	23	0	89	36	183	9	0	228	645
5:00PM	5	51	43	0	99	18	208	35	0	261	29	56	33	0	118	31	185	5	0	221	699
5:15PM	2	49	24	0	75	21	221	56	0	298	28	26	38	0	92	62	190	8	0	260	725
Total	13	177	120	0	310	90	823	169	0	1082	113	155	123	0	391	166	742	26	0	934	2717
% Approach	4.2%	57.1%	38.7%	0%	-	8.3%	76.1%	15.6%	0%	-	28.9%	39.6%	31.5%	0%	-	17.8%	79.4%	2.8%	0%	-	-
% Total	0.5%	6.5%	4.4%	0%	11.4%	3.3%	30.3%	6.2%	0%	39.8%	4.2%	5.7%	4.5%	0%	14.4%	6.1%	27.3%	1.0%	0%	34.4%	-
PHF	0.650	0.868	0.698	-	0.783	0.776	0.931	0.754	-	0.908	0.974	0.692	0.809	-	0.828	0.669	0.976	0.722	-	0.898	0.937
Lights and Motorcycles	12	177	117	0	306	90	816	169	0	1075	113	154	121	0	388	165	728	26	0	919	2688
% Lights and Motorcycles	92.3%	100%	97.5%	0%	98.7%	100%	99.1%	100%	0%	99.4%	100%	99.4%	98.4%	0%	99.2%	99.4%	98.1%	100%	0%	98.4%	98.9%
Heavy	1	0	3	0	4	0	7	0	0	7	0	1	2	0	3	1	14	0	0	15	29
% Heavy	7.7%	0%	2.5%	0%	1.3%	0%	0.9%	0%	0%	0.6%	0%	0.6%	1.6%	0%	0.8%	0.6%	1.9%	0%	0%	1.6%	1.1%

* L: Left, R: Right, T: Thru, U: U-Turn



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound				Shaver Rd Northbound				Walgreen Driveway Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2022-12-06 7:00AM	4	48	0	52	44	0	0	44	3	1	0	4	100
7:15AM	0	65	0	65	93	0	0	93	2	0	0	2	160
7:30AM	0	70	0	70	74	0	0	74	0	1	0	1	145
7:45AM	6	75	0	81	84	0	0	84	1	0	0	1	166
Hourly Total	10	258	0	268	295	0	0	295	6	2	0	8	571
8:00AM	2	53	0	55	81	0	0	81	0	2	0	2	138
8:15AM	3	76	0	79	81	0	0	81	5	3	0	8	168
8:30AM	3	71	0	74	92	1	0	93	1	2	0	3	170
8:45AM	10	74	0	84	93	0	0	93	2	1	0	3	180
Hourly Total	18	274	0	292	347	1	0	348	8	8	0	16	656
4:00PM	17	208	0	225	161	2	0	163	5	6	0	11	399
4:15PM	18	167	0	185	146	1	0	147	13	3	0	16	348
4:30PM	10	149	0	159	149	0	0	149	8	3	0	11	319
4:45PM	8	150	0	158	145	1	0	146	6	4	0	10	314
Hourly Total	53	674	0	727	601	4	0	605	32	16	0	48	1380
5:00PM	14	182	0	196	153	0	0	153	8	2	0	10	359
5:15PM	7	196	0	203	133	2	0	135	9	3	0	12	350
5:30PM	11	149	0	160	122	0	0	122	3	3	0	6	288
5:45PM	15	134	0	149	116	0	0	116	11	1	0	12	277
Hourly Total	47	661	0	708	524	2	0	526	31	9	0	40	1274
Total	128	1867	0	1995	1767	7	0	1774	77	35	0	112	3881
% Approach	6.4%	93.6%	0%	-	99.6%	0.4%	0%	-	68.8%	31.3%	0%	-	-
% Total	3.3%	48.1%	0%	51.4%	45.5%	0.2%	0%	45.7%	2.0%	0.9%	0%	2.9%	-
Lights and Motorcycles	128	1832	0	1960	1733	7	0	1740	77	34	0	111	3811
% Lights and Motorcycles	100%	98.1%	0%	98.2%	98.1%	100%	0%	98.1%	100%	97.1%	0%	99.1%	98.2%
Heavy	0	35	0	35	34	0	0	34	0	1	0	1	70
% Heavy	0%	1.9%	0%	1.8%	1.9%	0%	0%	1.9%	0%	2.9%	0%	0.9%	1.8%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

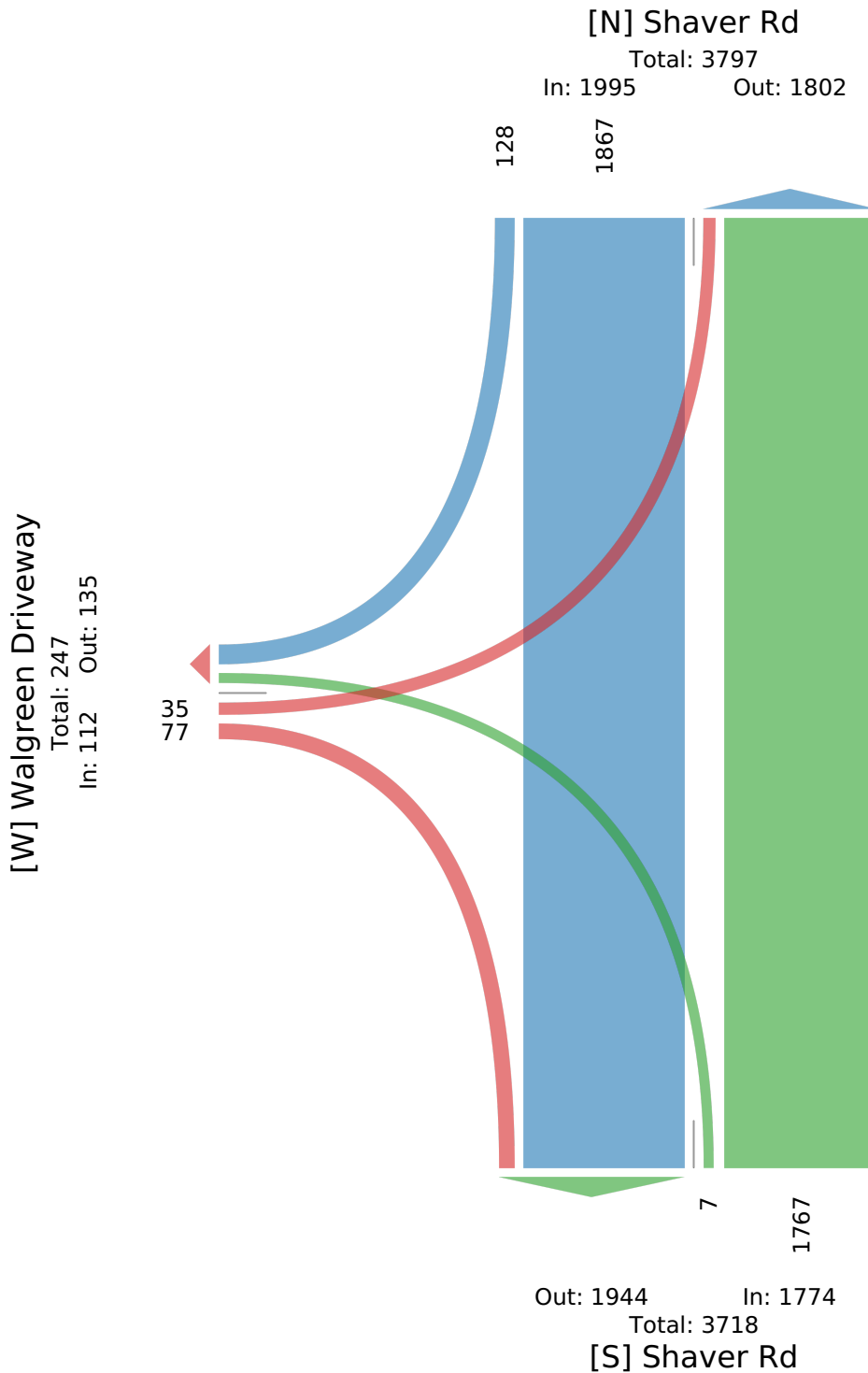
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

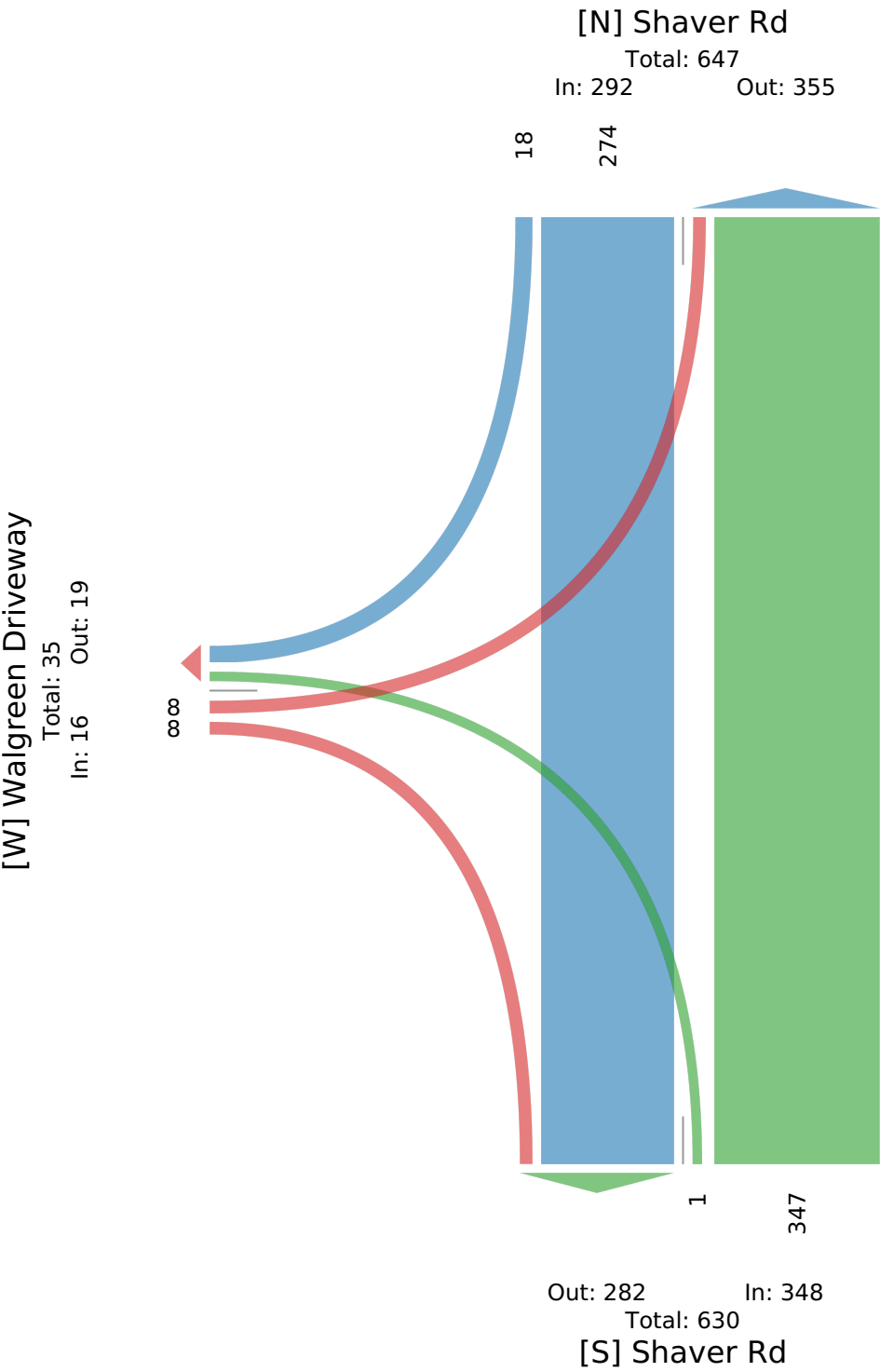
Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound				Shaver Rd Northbound				Walgreen Driveway Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2022-12-06 8:00AM	2	53	0	55	81	0	0	81	0	2	0	2	138
8:15AM	3	76	0	79	81	0	0	81	5	3	0	8	168
8:30AM	3	71	0	74	92	1	0	93	1	2	0	3	170
8:45AM	10	74	0	84	93	0	0	93	2	1	0	3	180
Total	18	274	0	292	347	1	0	348	8	8	0	16	656
% Approach	6.2%	93.8%	0%	-	99.7%	0.3%	0%	-	50.0%	50.0%	0%	-	-
% Total	2.7%	41.8%	0%	44.5%	52.9%	0.2%	0%	53.0%	1.2%	1.2%	0%	2.4%	-
PHF	0.450	0.901	-	0.869	0.933	0.250	-	0.935	0.400	0.667	-	0.500	0.911
Lights and Motorcycles	18	259	0	277	330	1	0	331	8	8	0	16	624
% Lights and Motorcycles	100%	94.5%	0%	94.9%	95.1%	100%	0%	95.1%	100%	100%	0%	100%	95.1%
Heavy	0	15	0	15	17	0	0	17	0	0	0	0	32
% Heavy	0%	5.5%	0%	5.1%	4.9%	0%	0%	4.9%	0%	0%	0%	0%	4.9%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC
Tue Dec 6, 2022
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

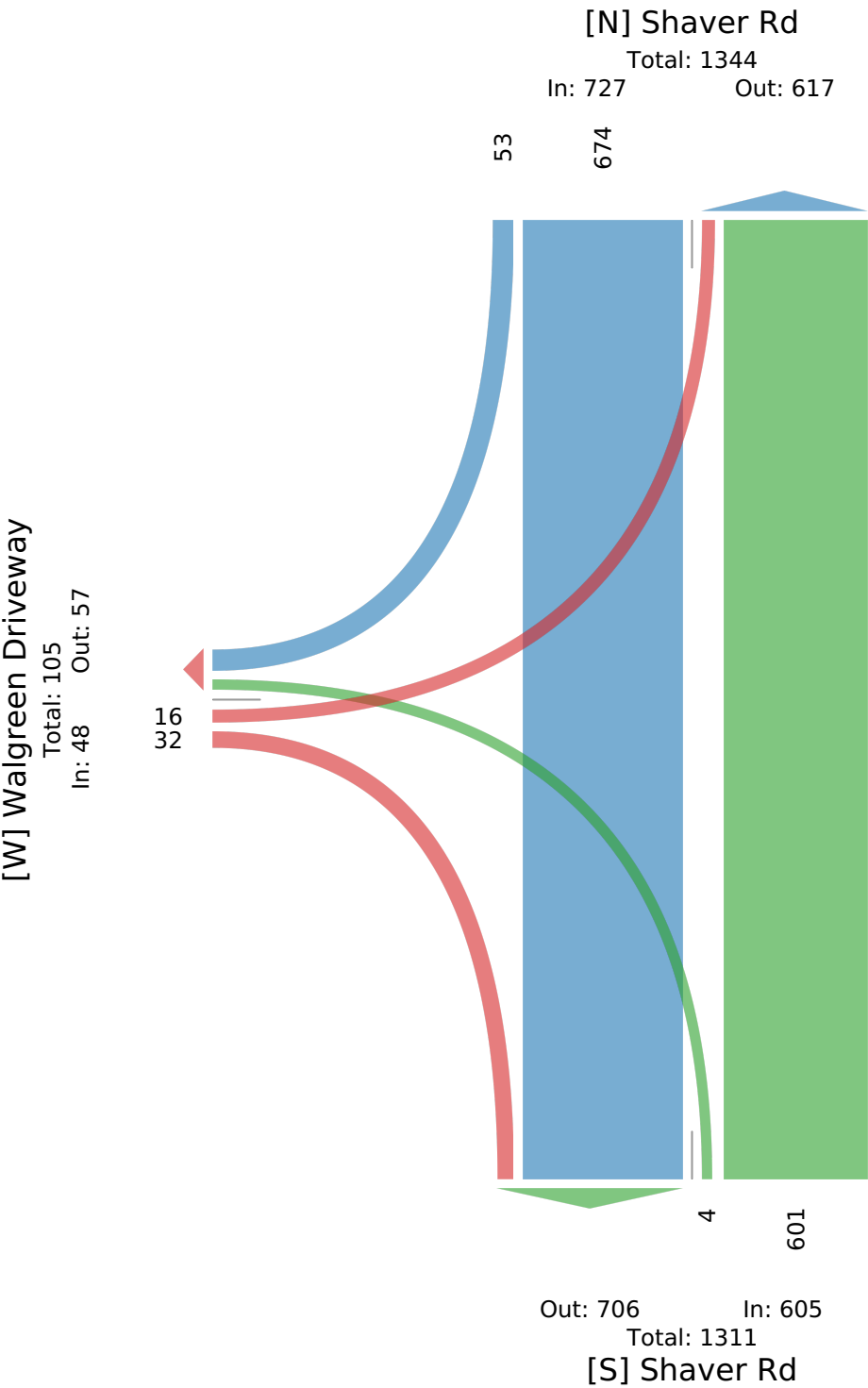
Leg Direction	Shaver Rd Southbound				Shaver Rd Northbound				Walgreen Driveway Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2022-12-06 4:00PM	17	208	0	225	161	2	0	163	5	6	0	11	399
4:15PM	18	167	0	185	146	1	0	147	13	3	0	16	348
4:30PM	10	149	0	159	149	0	0	149	8	3	0	11	319
4:45PM	8	150	0	158	145	1	0	146	6	4	0	10	314
Total	53	674	0	727	601	4	0	605	32	16	0	48	1380
% Approach	7.3%	92.7%	0%	-	99.3%	0.7%	0%	-	66.7%	33.3%	0%	-	-
% Total	3.8%	48.8%	0%	52.7%	43.6%	0.3%	0%	43.8%	2.3%	1.2%	0%	3.5%	-
PHF	0.736	0.810	-	0.808	0.933	0.500	-	0.928	0.615	0.667	-	0.750	0.865
Lights and Motorcycles	53	668	0	721	599	4	0	603	32	15	0	47	1371
% Lights and Motorcycles	100%	99.1%	0%	99.2%	99.7%	100%	0%	99.7%	100%	93.8%	0%	97.9%	99.3%
Heavy	0	6	0	6	2	0	0	2	0	1	0	1	9
% Heavy	0%	0.9%	0%	0.8%	0.3%	0%	0%	0.3%	0%	6.3%	0%	2.1%	0.7%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022
PM Peak (4 PM - 5 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Huntington Driveway Southbound				Centre Ave Westbound				Centre Ave Eastbound				
Time	R	L	U	App	R	T	U	App	T	L	U	App	Int
2022-12-08 7:00AM	3	0	0	3	1	121	0	122	172	2	1	175	300
7:15AM	2	0	0	2	1	197	0	198	316	2	1	319	519
7:30AM	2	1	0	3	4	245	0	249	202	3	0	205	457
7:45AM	4	0	0	4	2	165	0	167	226	4	0	230	401
Hourly Total	11	1	0	12	8	728	0	736	916	11	2	929	1677
8:00AM	5	0	0	5	5	147	0	152	177	4	0	181	338
8:15AM	5	3	0	8	10	160	0	170	157	3	0	160	338
8:30AM	7	4	0	11	7	166	0	173	140	7	0	147	331
8:45AM	11	2	0	13	13	173	0	186	190	15	0	205	404
Hourly Total	28	9	0	37	35	646	0	681	664	29	0	693	1411
4:00PM	10	10	0	20	7	270	0	277	253	13	1	267	564
4:15PM	15	5	0	20	2	244	0	246	241	17	0	258	524
4:30PM	14	6	0	20	4	262	0	266	234	8	2	244	530
4:45PM	11	8	0	19	3	224	0	227	252	15	0	267	513
Hourly Total	50	29	0	79	16	1000	0	1016	980	53	3	1036	2131
5:00PM	21	8	0	29	10	271	0	281	277	13	0	290	600
5:15PM	9	6	0	15	13	275	0	288	283	9	0	292	595
5:30PM	19	8	0	27	11	228	0	239	218	11	0	229	495
5:45PM	14	10	0	24	11	192	0	203	205	8	0	213	440
Hourly Total	63	32	0	95	45	966	0	1011	983	41	0	1024	2130
Total	152	71	0	223	104	3340	0	3444	3543	134	5	3682	7349
% Approach	68.2%	31.8%	0%	-	3.0%	97.0%	0%	-	96.2%	3.6%	0.1%	-	-
% Total	2.1%	1.0%	0%	3.0%	1.4%	45.4%	0%	46.9%	48.2%	1.8%	0.1%	50.1%	-
Lights and Motorcycles	149	71	0	220	102	3279	0	3381	3472	133	5	3610	7211
% Lights and Motorcycles	98.0%	100%	0%	98.7%	98.1%	98.2%	0%	98.2%	98.0%	99.3%	100%	98.0%	98.1%
Heavy	3	0	0	3	2	61	0	63	71	1	0	72	138
% Heavy	2.0%	0%	0%	1.3%	1.9%	1.8%	0%	1.8%	2.0%	0.7%	0%	2.0%	1.9%

* L: Left, R: Right, T: Thru, U: U-Turn

ID: 1023351, Location: 42.201003, -85.592773

(169)

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

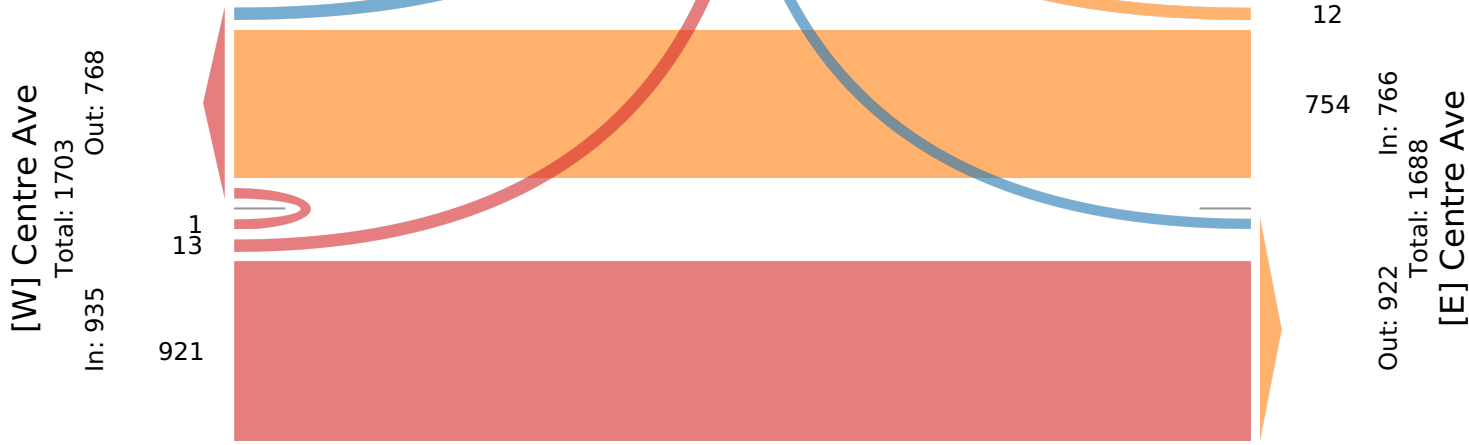
Leg Direction	Huntington Driveway Southbound				Centre Ave Westbound				Centre Ave Eastbound				
Time	R	L	U	App	R	T	U	App	T	L	U	App	Int
2022-12-08 7:15AM	2	0	0	2	1	197	0	198	316	2	1	319	519
7:30AM	2	1	0	3	4	245	0	249	202	3	0	205	457
7:45AM	4	0	0	4	2	165	0	167	226	4	0	230	401
8:00AM	5	0	0	5	5	147	0	152	177	4	0	181	338
Total	13	1	0	14	12	754	0	766	921	13	1	935	1715
% Approach	92.9%	7.1%	0%	-	1.6%	98.4%	0%	-	98.5%	1.4%	0.1%	-	-
% Total	0.8%	0.1%	0%	0.8%	0.7%	44.0%	0%	44.7%	53.7%	0.8%	0.1%	54.5%	-
PHF	0.650	0.250	-	0.700	0.600	0.769	-	0.769	0.729	0.813	0.250	0.733	0.826
Lights and Motorcycles	12	1	0	13	12	727	0	739	907	12	1	920	1672
% Lights and Motorcycles	92.3%	100%	0%	92.9%	100%	96.4%	0%	96.5%	98.5%	92.3%	100%	98.4%	97.5%
Heavy	1	0	0	1	0	27	0	27	14	1	0	15	43
% Heavy	7.7%	0%	0%	7.1%	0%	3.6%	0%	3.5%	1.5%	7.7%	0%	1.6%	2.5%

* L: Left, R: Right, T: Thru, U: U-Turn

[N] Huntington Driveway

Total: 39
In: 14 Out: 25

13
1



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

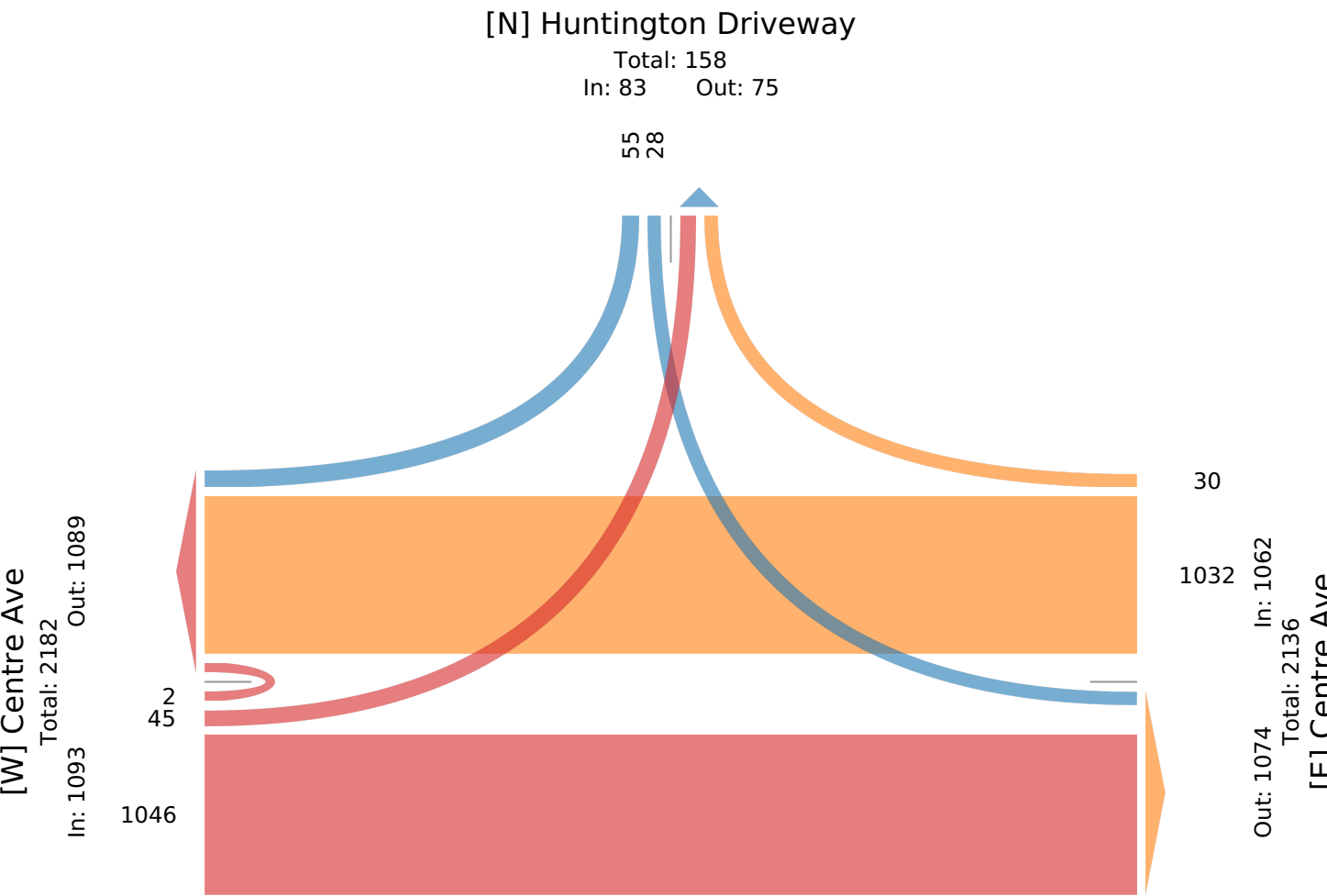
All Movements

ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Huntington Driveway Southbound				Centre Ave Westbound				Centre Ave Eastbound				
Time	R	L	U	App	R	T	U	App	T	L	U	App	Int
2022-12-08 4:30PM	14	6	0	20	4	262	0	266	234	8	2	244	530
4:45PM	11	8	0	19	3	224	0	227	252	15	0	267	513
5:00PM	21	8	0	29	10	271	0	281	277	13	0	290	600
5:15PM	9	6	0	15	13	275	0	288	283	9	0	292	595
Total	55	28	0	83	30	1032	0	1062	1046	45	2	1093	2238
% Approach	66.3%	33.7%	0%	-	2.8%	97.2%	0%	-	95.7%	4.1%	0.2%	-	-
% Total	2.5%	1.3%	0%	3.7%	1.3%	46.1%	0%	47.5%	46.7%	2.0%	0.1%	48.8%	-
PHF	0.655	0.875	-	0.716	0.577	0.938	-	0.922	0.924	0.750	0.250	0.936	0.933
Lights and Motorcycles	54	28	0	82	29	1027	0	1056	1030	45	2	1077	2215
% Lights and Motorcycles	98.2%	100%	0%	98.8%	96.7%	99.5%	0%	99.4%	98.5%	100%	100%	98.5%	99.0%
Heavy	1	0	0	1	1	5	0	6	16	0	0	16	23
% Heavy	1.8%	0%	0%	1.2%	3.3%	0.5%	0%	0.6%	1.5%	0%	0%	1.5%	1.0%

* L: Left, R: Right, T: Thru, U: U-Turn



Appendix C

TRAFFIC ANALYSIS

Portage Creek Development Trip Generation (Trip Generation Manual 11th Edition)											
LUC	Description	Number	Unit	AM Peak				PM Peak			
				Equation	In	Out	Total	Equation	In	Out	Total
220	Multifamily Housing (Low-Rise)	228	Dwelling Unit	$T = 0.31(X) + 22.85$	23	71	94	$T = 0.43(X) + 20.55$	75	44	119
				Total	23	71	94	Total	75	44	119

PORTAGE CREEK DEVELOPMENT - TRIP DISTRIBUTION													
ITE Trip Generation		AM Peak Hour Distribution											
Enter/Exit		Entering						Exiting					
Site Driveways		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use		Multifamily Housing (Low-Rise)											
Total Enter/Exit		23						71					
Internal Distribution % *		40%		40%		20%		40%		40%		20%	
Access Point Distribution % **		45%	55%	46%	54%	46%	54%	45%	55%	46%	54%	46%	54%
Access Point Volumes		4	5	4	5	2	3	13	15	13	15	7	8
Assumed Typical Diversion ***		N/A						N/A	-5	3	N/A	N/A	2
All Land Uses Total		4	5	4	5	2	3	13	10	16	15	7	10
ITE Trip Generation		PM Peak Hour Distribution											
Enter/Exit		Entering						Exiting					
Site Driveways		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use		Multifamily Housing (Low-Rise)											
Total Enter/Exit		75						44					
Internal Distribution % *		40%		40%		20%		40%		40%		20%	
Access Point Distribution % **		49%	51%	55%	45%	55%	45%	48%	51%	55%	45%	55%	45%
Access Point Volumes		15	15	16	14	8	7	8	9	10	8	5	4
Assumed Typical Diversion ***		N/A						N/A	-4	2	N/A	N/A	2
All Land Uses Total		15	15	16	14	8	7	8	5	12	8	5	6

*Internal Distribution: Assumed 40% of the traffic will be using the driveway on W Centre Ave, 40% using the Walgreens driveway on Shaver, and 20% using the north driveway on Shaver.

** The initial access point distribution is based on existing traffic on W. Centre Ave (Eastbound/Westbound) and Shaver Rd (Northbound/Southbound).

*** EB left and EB right at Centre/Shavers traffic is diverted to Shaver Rd North and South Site Dr. EB thru on Centre Ave continue to use Centre Ave Site Driveway exit left

EXISTING VOLUME SPLITS (W. Centre Ave)				
			AM	PM
W. Centre Ave at Site Driveway	Eastbound	Left	13	45
		Thru	921	1046
	Westbound	Thru	754	1032
		Right	12	30
EXISTING VOLUME SPLITS (Shaver Rd)				
Shaver Rd at Walgreens Driveway	Northbound	Left	1	4
		Thru	347	601
	Southbound	Thru	274	674
		Right	18	53

Split for W. Centre Ave		
Direction	AM	PM
Eastbound	55%	51%
Westbound	45%	49%
TOTAL	100%	100%
Split for Shaver Rd		
Direction	AM	PM
Northbound	54%	45%
Southbound	46%	55%
TOTAL	100%	100%

Trip distributions on W. Centre Rd and Shaver Rd

2022 Existing Traffic Volume									
Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count	
			AM Peak	PM Peak				AM Peak	PM Peak
W. Centre Ave at Shaver Rd	Eastbound	Left	86	190	Shaver Rd North Site Driveway	Eastbound	Left	0	0
		Thru	707	584			Right	22	11
		Right	131	218		Northbound	Left	27	53
	Westbound	Left	138	180			Thru	328	564
		Thru	646	768		Southbound	Thru	270	716
		Right	12	25			Right	0	0
	Northbound	Left	89	182	Shaver Rd South Site Driveway	Eastbound	Left	8	16
		Thru	234	392			Right	8	32
		Right	103	214		Northbound	Left	1	4
	Southbound	Left	17	59			Thru	347	601
		Thru	173	507		Southbound	Thru	274	674
		Right	69	130			Right	18	53
Shaver Rd at S. Westnedge	Eastbound	Left	1	4	W. Centre Ave Site Driveway	Eastbound	Left	13	45
		Thru	0	8			Thru	921	1046
		Right	2	9		Westbound	Thru	754	1032
	Westbound	Left	5	19			Right	12	30
		Thru	3	4		Southbound	Left	1	28
		Right	240	344			Right	13	55
	Northbound	Left	3	2	2022 Traffic Volumes				
		Thru	294	552					
		Right	31	10					
	Southbound	Left	229	347					
		Thru	263	688					
		Right	6	2					
W. Centre Ave at S. Westnedge	Eastbound	Left	12	26					
		Thru	706	742					
		Right	127	166					
	Westbound	Left	111	169					
		Thru	519	823					
		Right	52	90					
	Northbound	Left	174	123					
		Thru	153	155					
		Right	169	113					
Southbound	Left	107	120						
	Thru	116	177						
	Right	3	13						

2024 Existing Traffic Volume with 0.5% growth														
Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count						
			AM Peak	PM Peak				AM Peak	PM Peak					
W. Centre Ave at Shaver Rd	Eastbound	Left	87	192	Shaver Rd North Site Driveway	Eastbound	Left	0	0					
		Thru	715	590			Right	23	12					
		Right	133	221		Northbound	Left	28	54					
	Westbound	Left	140	182			Thru	332	570					
		Thru	653	776		Southbound	Thru	273	724					
		Right	13	26			Right	0	0					
	Northbound	Left	90	184	Shaver Rd South Site Driveway	Eastbound	Left	9	17					
		Thru	237	396			Right	9	33					
		Right	105	217		Northbound	Left	2	5					
	Southbound	Left	18	60			Thru	351	608					
		Thru	175	513		Southbound	Thru	277	681					
		Right	70	132			Right	19	54					
Shaver Rd at S. Westnedge	Eastbound	Left	2	5	W. Centre Ave Site Driveway	Eastbound	Left	14	46					
		Thru	0	9			Thru	931	1057					
		Right	3	10		Westbound	Thru	762	1043					
	Westbound	Left	6	20			Right	13	31					
		Thru	4	5		Southbound	Left	2	29					
		Right	243	348			Right	14	56					
	Northbound	Left	4	3	Year 2024 Future Traffic Volumes (0.5% Growth)									
		Thru	297	558										
		Right	32	11										
	Southbound	Left	232	351										
		Thru	266	695										
		Right	7	3										
W. Centre Ave at S. Westnedge	Eastbound	Left	13	27						Year 2024 Future Traffic Volumes (0.5% Growth)				
		Thru	714	750										
		Right	129	168										
	Westbound	Left	113	171										
		Thru	525	832										
		Right	53	91										
	Northbound	Left	176	125										
		Thru	155	157										
		Right	171	115										
	Southbound	Left	109	122										
		Thru	118	179										
		Right	4	14										

Appendix D

SYNCHRO AND SIMTRAFFIC REPORTS

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
Existing 2022 AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	707	131	138	636	12	89	250	103	17	196	69
Future Volume (veh/h)	86	707	131	138	636	12	89	250	103	17	196	69
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	1870	1870	1870	1856	1856	1856	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	116	955	0	184	848	16	103	291	120	20	231	81
Peak Hour Factor	0.74	0.74	0.74	0.75	0.75	0.75	0.86	0.86	0.86	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	5	5	5	3	3	3
Cap, veh/h	380	1806		386	1807	34	227	392	158	168	322	110
Arrive On Green	0.07	0.51	0.00	0.02	0.17	0.17	0.07	0.16	0.16	0.03	0.12	0.12
Sat Flow, veh/h	1781	3554	1585	1767	3540	67	1739	2413	972	1767	2580	880
Grp Volume(v), veh/h	116	955	0	184	422	442	103	207	204	20	156	156
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1767	1763	1844	1739	1735	1651	1767	1763	1697
Q Serve(g_s), s	3.0	18.1	0.0	4.8	21.6	21.6	5.1	11.4	11.8	1.0	8.5	8.9
Cycle Q Clear(g_c), s	3.0	18.1	0.0	4.8	21.6	21.6	5.1	11.4	11.8	1.0	8.5	8.9
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.59	1.00		0.52
Lane Grp Cap(c), veh/h	380	1806		386	900	941	227	282	268	168	220	212
V/C Ratio(X)	0.31	0.53		0.48	0.47	0.47	0.45	0.74	0.76	0.12	0.71	0.74
Avail Cap(c_a), veh/h	430	1806		431	900	941	310	512	487	318	520	501
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	16.5	0.0	13.0	29.3	29.3	34.9	39.8	40.0	36.5	42.0	42.2
Incr Delay (d2), s/veh	0.4	1.1	0.0	0.9	1.8	1.7	1.4	3.7	4.4	0.3	4.2	4.9
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(50%),veh/ln	1.1	7.2	0.0	2.0	10.6	11.0	2.2	5.0	5.0	0.4	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	17.7	0.0	13.9	31.1	31.0	36.3	43.6	44.4	36.8	46.2	47.1
LnGrp LOS	B	B		B	C	C	D	D	D	D	D	D
Approach Vol, veh/h	1071				1048				514		332	
Approach Delay, s/veh	17.1				28.0				42.5		46.0	
Approach LOS	B				C				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	21.7	13.2	56.6	12.2	18.0	13.5	56.3				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	11.5	29.5	9.5	26.5	11.5	29.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	3.0	13.8	5.0	23.6	7.1	10.9	6.8	20.1				
Green Ext Time (p_c), s	0.0	2.1	0.1	1.4	0.1	1.6	0.1	3.3				

Intersection Summary

HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
Existing 2022 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	2	5	3	240	3	294	31	229	263	6
Future Volume (veh/h)	1	0	2	5	3	240	3	294	31	229	263	6
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	1411	1411	1411	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	1	0	3	7	4	329	3	316	33	283	325	7
Peak Hour Factor	0.75	0.75	0.75	0.73	0.73	0.73	0.93	0.93	0.93	0.81	0.81	0.81
Percent Heavy Veh, %	33	33	33	3	3	3	4	4	4	3	3	3
Cap, veh/h	263	0	258	285	149	373	600	1584	164	710	2090	45
Arrive On Green	0.24	0.00	0.24	0.24	0.24	0.24	0.01	0.50	0.50	0.10	0.59	0.59
Sat Flow, veh/h	775	0	1088	927	628	1572	1753	3198	332	1767	3529	76
Grp Volume(v), veh/h	1	0	3	11	0	329	3	172	177	283	162	170
Grp Sat Flow(s),veh/h/ln	775	0	1088	1556	0	1572	1753	1749	1781	1767	1763	1842
Q Serve(g_s), s	0.1	0.0	0.2	0.0	0.0	18.3	0.1	5.0	5.1	6.6	3.8	3.8
Cycle Q Clear(g_c), s	0.5	0.0	0.2	0.4	0.0	18.3	0.1	5.0	5.1	6.6	3.8	3.8
Prop In Lane	1.00		1.00	0.64		1.00	1.00		0.19	1.00		0.04
Lane Grp Cap(c), veh/h	263	0	258	434	0	373	600	866	882	710	1044	1091
V/C Ratio(X)	0.00	0.00	0.01	0.03	0.00	0.88	0.01	0.20	0.20	0.40	0.16	0.16
Avail Cap(c_a), veh/h	467	0	539	831	0	779	1073	866	882	1015	1044	1091
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	26.5	26.6	0.0	33.4	11.3	12.8	12.9	8.2	8.3	8.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.5	0.5	0.4	0.3	0.3
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(50%),veh/ln	0.0	0.0	0.1	0.2	0.0	7.6	0.0	2.0	2.0	2.2	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	26.5	26.6	0.0	40.4	11.3	13.3	13.4	8.6	8.6	8.6
LnGrp LOS	C	A	C	C	A	D	B	B	B	A	A	A
Approach Vol, veh/h	4			340			352			615		
Approach Delay, s/veh	26.6			39.9			13.3			8.6		
Approach LOS	C			D			B			A		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	4.3	50.0	26.5		5.5	58.8	26.5					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	25.0	45.0	45.0		25.0	45.0	45.0					
Max Q Clear Time (g_c+I), s	10.6	7.1	20.3		2.1	5.8	2.5					
Green Ext Time (p_c), s	0.7	2.1	1.2		0.0	2.0	0.0					
Intersection Summary												
HCM 6th Ctrl Delay			18.0									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
Existing 2022 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	706	127	111	519	52	174	153	169	107	116	3
Future Volume (veh/h)	12	706	127	111	519	52	174	153	169	107	116	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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	13	743	134	117	546	55	249	219	241	157	171	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.70	0.70	0.70	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	4	4	4
Cap, veh/h	365	1038	187	258	1116	112	523	723	322	514	367	9
Arrive On Green	0.02	0.11	0.11	0.07	0.34	0.34	0.17	0.20	0.20	0.17	0.20	0.20
Sat Flow, veh/h	1781	3007	542	1767	3235	325	1767	3526	1572	1753	1791	42
Grp Volume(v), veh/h	13	439	438	117	297	304	249	219	241	157	0	175
Grp Sat Flow(s),veh/h/ln	1781	1777	1773	1767	1763	1797	1767	1763	1572	1753	0	1833
Q Serve(g_s), s	0.0	23.8	23.8	0.0	13.3	13.3	0.0	5.3	14.4	0.0	0.0	8.4
Cycle Q Clear(g_c), s	0.0	23.8	23.8	0.0	13.3	13.3	0.0	5.3	14.4	0.0	0.0	8.4
Prop In Lane	1.00		0.31	1.00		0.18	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	365	613	612	258	608	620	523	723	322	514	0	376
V/C Ratio(X)	0.04	0.72	0.72	0.45	0.49	0.49	0.48	0.30	0.75	0.31	0.00	0.47
Avail Cap(c_a), veh/h	396	613	612	289	608	620	523	723	322	514	0	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	39.6	39.6	40.5	25.8	25.8	30.7	33.7	37.3	27.5	0.0	34.9
Incr Delay (d2), s/veh	0.0	7.0	7.0	1.2	2.8	2.8	0.7	1.1	14.7	0.3	0.0	4.1
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(50%),veh/ln	0.2	12.5	12.4	2.8	5.8	6.0	5.1	2.3	6.8	3.0	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	46.6	46.6	41.7	28.6	28.6	31.4	34.8	52.0	27.8	0.0	39.0
LnGrp LOS	C	D	D	D	C	C	C	C	D	C	A	D
Approach Vol, veh/h	890			718			709			332		
Approach Delay, s/veh	46.3			30.7			39.4			33.7		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	40.0	22.8	25.0	12.2	40.0	22.8	25.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	34.5	34.5	15.5	20.5	8.5	34.5	15.5	20.5				
Max Q Clear Time (g_c+1/2, s)	25.8	25.8	2.0	16.4	2.0	15.3	2.0	10.4				
Green Ext Time (p_c), s	0.1	3.5	0.3	0.9	0.0	3.4	0.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	22	27	328	270	0
Future Vol, veh/h	0	22	27	328	270	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	29	357	293	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	530	147	293	0	-	0
Stage 1	293	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	479	873	1265	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	468	873	1265	-	-	-
Mov Cap-2 Maneuver	553	-	-	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1265	-	873	-	-	
HCM Lane V/C Ratio	0.023	-	0.027	-	-	
HCM Control Delay (s)	7.9	-	9.2	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	8	1	347	274	18
Future Vol, veh/h	8	8	1	347	274	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	94	94	87	87
Heavy Vehicles, %	0	0	5	5	5	5
Mvmt Flow	13	13	1	369	315	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	513	168	336	0	-	0
Stage 1	326	-	-	-	-	-
Stage 2	187	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	496	853	1199	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	496	853	1199	-	-	-
Mov Cap-2 Maneuver	572	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1199	-	572	853	-	-
HCM Lane V/C Ratio	0.001	-	0.023	0.016	-	-
HCM Control Delay (s)	8	-	11.4	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
Existing 2022 AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑		↑	↑		
Traffic Volume (veh/h)	13	923	782	12	1	13		
Future Volume (Veh/h)	13	923	782	12	1	13		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	1.00	1.00	0.77	0.77	0.70	0.70		
Hourly flow rate (vph)	13	923	1016	16	1	19		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.82				0.82	0.82		
vC, conflicting volume	1032				1281	516		
vC1, stage 1 conf vol					1024			
vC2, stage 2 conf vol					257			
vCu, unblocked vol	589				893	0		
tC, single (s)	4.1				6.9	7.0		
tC, 2 stage (s)					5.9			
tF (s)	2.2				3.6	3.4		
p0 queue free %	98				100	98		
cM capacity (veh/h)	802				388	872		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	145	264	264	264	677	355	1	19
Volume Left	13	0	0	0	0	0	1	0
Volume Right	0	0	0	0	0	16	0	19
cSH	802	1700	1700	1700	1700	1700	388	872
Volume to Capacity	0.02	0.16	0.16	0.16	0.40	0.21	0.00	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	0	2
Control Delay (s)	1.0	0.0	0.0	0.0	0.0	0.0	14.3	9.2
Lane LOS	A						B	A
Approach Delay (s)	0.2				0.0		9.5	
Approach LOS							A	
Intersection Summary								
Average Delay			0.2					
Intersection Capacity Utilization			32.3%		ICU Level of Service			A
Analysis Period (min)			15					

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
Existing 2022 PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	584	218	180	768	25	182	390	214	59	517	130
Future Volume (veh/h)	190	584	218	180	768	25	182	390	214	59	517	130
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	200	615	0	189	808	26	219	470	258	70	615	155
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	336	1518		448	1524	49	199	540	294	188	629	158
Arrive On Green	0.07	0.43	0.00	0.02	0.14	0.14	0.07	0.24	0.24	0.05	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	1795	3542	114	1795	2236	1220	1795	2835	713
Grp Volume(v), veh/h	200	615	0	189	409	425	219	376	352	70	388	382
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1865	1795	1791	1666	1795	1791	1757
Q Serve(g_s), s	7.3	13.8	0.0	6.5	24.3	24.3	8.5	23.2	23.4	3.4	24.8	24.9
Cycle Q Clear(g_c), s	7.3	13.8	0.0	6.5	24.3	24.3	8.5	23.2	23.4	3.4	24.8	24.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.73	1.00		0.41
Lane Grp Cap(c), veh/h	336	1518		448	771	803	199	432	402	188	397	390
V/C Ratio(X)	0.60	0.41		0.42	0.53	0.53	1.10	0.87	0.88	0.37	0.98	0.98
Avail Cap(c_a), veh/h	336	1518		448	771	803	199	432	402	223	397	390
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	22.6	0.0	17.8	38.5	38.5	37.7	41.9	42.0	33.5	44.5	44.5
Incr Delay (d2), s/veh	2.8	0.8	0.0	0.6	2.6	2.5	92.8	17.1	19.0	1.2	39.1	40.2
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(50%),veh/ln	3.1	5.8	0.0	2.9	12.2	12.7	6.6	12.1	11.6	1.5	15.1	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	23.4	0.0	18.4	41.1	41.0	130.4	59.0	61.0	34.7	83.5	84.7
LnGrp LOS	C	C		B	D	D	F	E	E	C	F	F
Approach Vol, veh/h	815			1023			947			840		
Approach Delay, s/veh	23.2			36.9			76.3			80.0		
Approach LOS	C			D			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	33.2	15.0	55.0	14.0	31.0	15.0	55.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	8.5	25.5	8.5	49.5	8.5	25.5	8.5	49.5				
Max Q Clear Time (g_c+I1), s	5.4	25.4	9.3	26.3	10.5	26.9	8.5	15.8				
Green Ext Time (p_c), s	0.0	0.1	0.0	5.3	0.0	0.0	0.0	4.5				

Intersection Summary

HCM 6th Ctrl Delay	54.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
Existing 2022 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	9	19	4	344	2	552	10	347	688	2
Future Volume (veh/h)	4	8	9	19	4	344	2	552	10	347	688	2
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	6	12	14	22	5	395	2	587	11	394	782	2
Peak Hour Factor	0.66	0.66	0.66	0.87	0.87	0.87	0.94	0.94	0.94	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	168	315	374	381	81	437	384	1586	30	598	2119	5
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.00	0.44	0.44	0.14	0.58	0.58
Sat Flow, veh/h	443	1161	1379	1171	297	1610	1795	3597	67	1795	3665	9
Grp Volume(v), veh/h	17	0	15	27	0	395	2	292	306	394	382	402
Grp Sat Flow(s),veh/h/ln	1502	0	1481	1468	0	1610	1795	1791	1873	1795	1791	1883
Q Serve(g_s), s	0.0	0.0	0.8	0.8	0.0	24.2	0.1	11.1	11.1	11.4	11.7	11.7
Cycle Q Clear(g_c), s	0.7	0.0	0.8	1.6	0.0	24.2	0.1	11.1	11.1	11.4	11.7	11.7
Prop In Lane	0.35		0.93	0.81		1.00	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	455	0	401	462	0	437	384	790	826	598	1035	1089
V/C Ratio(X)	0.04	0.00	0.04	0.06	0.00	0.90	0.01	0.37	0.37	0.66	0.37	0.37
Avail Cap(c_a), veh/h	700	0	653	713	0	710	817	790	826	785	1035	1089
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	27.4	27.7	0.0	35.9	15.8	19.1	19.1	12.0	11.5	11.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	9.7	0.0	1.3	1.3	1.3	1.0	1.0
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(50%),veh/ln	0.3	0.0	0.3	0.5	0.0	10.6	0.0	4.7	4.9	4.3	4.6	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	27.4	27.7	0.0	45.7	15.8	20.4	20.3	13.3	12.6	12.5
LnGrp LOS	C	A	C	C	A	D	B	C	C	B	B	B
Approach Vol, veh/h	32					422		600		1178		
Approach Delay, s/veh	27.4					44.5		20.4		12.8		
Approach LOS	C					D		C		B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	19.4	50.0	32.7		5.4	64.0	32.7					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	25.0	45.0	45.0		25.0	45.0	45.0					
Max Q Clear Time (g_c+I), s	13.4	13.1	26.2		2.1	13.7	2.8					
Green Ext Time (p_c), s	1.0	3.8	1.5		0.0	5.2	0.2					

Intersection Summary

HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
Existing 2022 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	742	166	169	823	90	123	155	113	120	177	13
Future Volume (veh/h)	26	742	166	169	823	90	123	155	113	120	177	13
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	29	824	184	186	904	99	148	187	136	154	227	17
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.83	0.83	0.83	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	242	1067	238	224	1203	132	491	701	313	568	339	25
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2887	645	1795	3255	357	1795	3582	1598	1795	1732	130
Grp Volume(v), veh/h	29	507	501	186	497	506	148	187	136	154	0	244
Grp Sat Flow(s),veh/h/ln	1781	1777	1754	1795	1791	1821	1795	1791	1598	1795	0	1862
Q Serve(g_s), s	0.0	31.8	31.8	4.3	27.9	27.9	0.0	5.1	8.6	0.0	0.0	14.0
Cycle Q Clear(g_c), s	0.0	31.8	31.8	4.3	27.9	27.9	0.0	5.1	8.6	0.0	0.0	14.0
Prop In Lane	1.00		0.37	1.00		0.20	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	242	657	648	224	662	673	491	701	313	568	0	364
V/C Ratio(X)	0.12	0.77	0.77	0.83	0.75	0.75	0.30	0.27	0.44	0.27	0.00	0.67
Avail Cap(c_a), veh/h	405	657	648	388	662	673	491	701	313	568	0	364
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.8	45.8	45.8	49.9	31.6	31.6	35.1	39.3	40.7	29.0	0.0	42.8
Incr Delay (d2), s/veh	0.2	8.6	8.7	7.7	7.7	7.6	0.3	0.9	4.4	0.3	0.0	9.4
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(50%),veh/ln	0.7	16.7	16.5	5.6	13.1	13.3	3.4	2.3	3.8	3.3	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	54.4	54.5	57.6	39.3	39.2	35.5	40.2	45.0	29.3	0.0	52.2
LnGrp LOS	D	D	D	E	D	D	D	D	D	C	A	D
Approach Vol, veh/h	1037			1189			471			398		
Approach Delay, s/veh	54.1			42.1			40.1			43.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.5	48.0	27.5	27.0	12.5	48.0	27.5	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	42.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+I), s	33.8	33.8	2.0	10.6	2.0	29.9	2.0	16.0				
Green Ext Time (p_c), s	0.4	4.1	0.3	1.2	0.0	5.1	0.2	0.7				

Intersection Summary

HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	53	564	716	0
Future Vol, veh/h	0	11	53	564	716	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	58	613	778	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1201	389	778	0	-	0
Stage 1	778	-	-	-	-	-
Stage 2	423	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	177	610	834	-	-	-
Stage 1	413	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	165	610	834	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	384	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	834	-	610	-	-	
HCM Lane V/C Ratio	0.069	-	0.02	-	-	
HCM Control Delay (s)	9.6	-	11	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	32	4	601	674	53
Future Vol, veh/h	16	32	4	601	674	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	21	43	4	646	832	65
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1196	449	897	0	-	0
Stage 1	865	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	179	557	765	-	-	-
Stage 1	373	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	178	557	765	-	-	-
Mov Cap-2 Maneuver	291	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	765	-	291	557	-	-
HCM Lane V/C Ratio	0.006	-	0.073	0.077	-	-
HCM Control Delay (s)	9.7	-	18.3	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.2	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
Existing 2022 PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	45	964	1050	30	28	55		
Future Volume (Veh/h)	45	964	1050	30	28	55		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.94	0.94	0.92	0.92	0.72	0.72		
Hourly flow rate (vph)	48	1026	1141	33	39	76		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.82				0.82	0.82		
vC, conflicting volume	1174				1510	587		
vC1, stage 1 conf vol					1158			
vC2, stage 2 conf vol					352			
vCu, unblocked vol	785				1192	73		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	93				88	91		
cM capacity (veh/h)	684				317	806		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	195	293	293	293	761	413	39	76
Volume Left	48	0	0	0	0	0	39	0
Volume Right	0	0	0	0	0	33	0	76
cSH	684	1700	1700	1700	1700	1700	317	806
Volume to Capacity	0.07	0.17	0.17	0.17	0.45	0.24	0.12	0.09
Queue Length 95th (ft)	6	0	0	0	0	0	10	8
Control Delay (s)	3.2	0.0	0.0	0.0	0.0	0.0	17.9	9.9
Lane LOS	A						C	A
Approach Delay (s)	0.6				0.0		12.6	
Approach LOS							B	
Intersection Summary								
Average Delay			0.9					
Intersection Capacity Utilization			57.4%		ICU Level of Service			B
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	56	260	286	215	255	288	86	166	210	57	97	137
Average Queue (ft)	19	132	114	53	136	144	47	73	65	10	45	55
95th Queue (ft)	44	220	211	122	225	242	87	142	145	33	92	111
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		1	1	0	1	2						
Queuing Penalty (veh)		3	2	0	3	7						
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	1							
Queuing Penalty (veh)				0	1							

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	48	31	124	31	117	114	132	91	45
Average Queue (ft)	1	2	7	61	3	38	33	45	20	12
95th Queue (ft)	10	16	26	99	18	90	92	88	64	37
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)					150					
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	281	285	195	256	196	124	232	97	120	160	141
Average Queue (ft)	16	189	196	61	108	72	86	24	53	64	81	59
95th Queue (ft)	90	267	287	122	199	162	133	102	95	115	146	117
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		3	4					1				
Queuing Penalty (veh)		12	17					0				
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		13			1		13	0	1	1		
Queuing Penalty (veh)		2			1		12	1	2	1		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	31	52
Average Queue (ft)	19	7
95th Queue (ft)	43	28
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB
Directions Served	L	R
Maximum Queue (ft)	31	31
Average Queue (ft)	2	7
95th Queue (ft)	12	29
Link Distance (ft)		222
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB
Directions Served	LT	R
Maximum Queue (ft)	74	55
Average Queue (ft)	12	16
95th Queue (ft)	49	46
Link Distance (ft)	80	370
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 62

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	302	216	201	220	312	293	300	519	474	174	291	292
Average Queue (ft)	97	128	122	122	226	215	149	219	179	62	189	198
95th Queue (ft)	199	184	186	242	308	285	313	468	383	169	302	297
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)	4	0	0	0	9	9		2			12	12
Queuing Penalty (veh)	11	0	0	0	47	46		0			46	46
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	9		21			0	20	
Queuing Penalty (veh)				1	17		42			0	13	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	T	TR	L	T	TR
Maximum Queue (ft)	50	30	69	207	217	231	175	133	130
Average Queue (ft)	6	7	19	94	84	96	91	68	35
95th Queue (ft)	28	28	49	163	167	188	159	122	85
Link Distance (ft)	457	457	484	484	207	207	868	868	868
Upstream Blk Time (%)					0	1			
Queuing Penalty (veh)					1	2			
Storage Bay Dist (ft)									
Storage Blk Time (%)					1				
Queuing Penalty (veh)					0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	162	312	312	199	284	262	124	153	141	125	163	219
Average Queue (ft)	24	199	223	109	151	129	80	33	84	46	74	93
95th Queue (ft)	80	309	324	185	240	227	121	106	138	96	134	159
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		4	7									
Queuing Penalty (veh)		22	36									
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)	0	12		1	4		10	1	8	0		
Queuing Penalty (veh)	0	3		4	7		8	1	10	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	31	53
Average Queue (ft)	8	18
95th Queue (ft)	30	47
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	51	74	31	55	103
Average Queue (ft)	10	23	2	5	8
95th Queue (ft)	33	51	14	27	45
Link Distance (ft)		222		322	322
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)		1	0		
Queuing Penalty (veh)		0	0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	138	53	52
Average Queue (ft)	31	13	26
95th Queue (ft)	83	42	50
Link Distance (ft)	80		370
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 361

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
No Build 2024 AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	715	133	140	653	13	90	253	105	18	198	70
Future Volume (veh/h)	87	715	133	140	653	13	90	253	105	18	198	70
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	1870	1870	1870	1856	1856	1856	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	118	966	0	187	871	17	105	294	122	21	233	82
Peak Hour Factor	0.74	0.74	0.74	0.75	0.75	0.75	0.86	0.86	0.86	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	5	5	5	3	3	3
Cap, veh/h	370	1798		381	1798	35	229	394	160	169	324	111
Arrive On Green	0.07	0.51	0.00	0.02	0.17	0.17	0.07	0.16	0.16	0.03	0.13	0.13
Sat Flow, veh/h	1781	3554	1585	1767	3537	69	1739	2408	977	1767	2577	883
Grp Volume(v), veh/h	118	966	0	187	434	454	105	210	206	21	157	158
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1767	1763	1843	1739	1735	1650	1767	1763	1697
Q Serve(g_s), s	3.0	18.4	0.0	4.9	22.3	22.3	5.2	11.5	11.9	1.0	8.6	9.0
Cycle Q Clear(g_c), s	3.0	18.4	0.0	4.9	22.3	22.3	5.2	11.5	11.9	1.0	8.6	9.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.59	1.00		0.52
Lane Grp Cap(c), veh/h	370	1798		381	896	937	229	283	270	169	222	214
V/C Ratio(X)	0.32	0.54		0.49	0.48	0.48	0.46	0.74	0.76	0.12	0.71	0.74
Avail Cap(c_a), veh/h	420	1798		425	896	937	310	512	487	318	520	501
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.8	16.8	0.0	13.3	29.7	29.7	34.8	39.8	40.0	36.3	42.0	42.1
Incr Delay (d2), s/veh	0.5	1.2	0.0	1.0	1.9	1.8	1.4	3.8	4.5	0.3	4.1	4.9
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(50%),veh/ln	1.2	7.3	0.0	2.0	10.9	11.4	2.2	5.1	5.1	0.4	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	17.9	0.0	14.2	31.6	31.5	36.2	43.6	44.5	36.6	46.1	47.0
LnGrp LOS	B	B		B	C	C	D	D	D	D	D	D
Approach Vol, veh/h	1084			1075			521			336		
Approach Delay, s/veh	17.4			28.6			42.5			46.0		
Approach LOS	B			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	21.8	13.2	56.3	12.3	18.1	13.5	56.1				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	11.5	29.5	9.5	26.5	11.5	29.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	3.0	13.9	5.0	24.3	7.2	11.0	6.9	20.4				
Green Ext Time (p_c), s	0.0	2.1	0.1	1.2	0.1	1.6	0.1	3.2				

Intersection Summary

HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	2	0	3	6	4	243	4	297	32	232	266	7
Future Volume (veh/h)	2	0	3	6	4	243	4	297	32	232	266	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	1411	1411	1411	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	3	0	4	8	5	333	4	319	34	286	328	9
Peak Hour Factor	0.75	0.75	0.75	0.73	0.73	0.73	0.93	0.93	0.93	0.81	0.81	0.81
Percent Heavy Veh, %	33	33	33	3	3	3	4	4	4	3	3	3
Cap, veh/h	263	0	261	279	160	377	597	1572	166	706	2064	57
Arrive On Green	0.24	0.00	0.24	0.24	0.24	0.24	0.01	0.49	0.49	0.10	0.59	0.59
Sat Flow, veh/h	769	0	1088	898	667	1572	1753	3191	338	1767	3505	96
Grp Volume(v), veh/h	3	0	4	13	0	333	4	174	179	286	165	172
Grp Sat Flow(s),veh/h/ln	769	0	1088	1565	0	1572	1753	1749	1780	1767	1763	1838
Q Serve(g_s), s	0.3	0.0	0.3	0.0	0.0	18.7	0.1	5.1	5.2	6.7	3.9	3.9
Cycle Q Clear(g_c), s	0.8	0.0	0.3	0.5	0.0	18.7	0.1	5.1	5.2	6.7	3.9	3.9
Prop In Lane	1.00		1.00	0.62		1.00	1.00		0.19	1.00		0.05
Lane Grp Cap(c), veh/h	263	0	261	439	0	377	597	861	877	706	1038	1082
V/C Ratio(X)	0.01	0.00	0.02	0.03	0.00	0.88	0.01	0.20	0.20	0.40	0.16	0.16
Avail Cap(c_a), veh/h	462	0	536	830	0	775	1064	861	877	1007	1038	1082
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	26.5	26.6	0.0	33.5	11.5	13.1	13.1	8.3	8.5	8.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.5	0.5	0.4	0.3	0.3
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(50%),veh/ln	0.1	0.0	0.1	0.2	0.0	7.7	0.0	2.0	2.1	2.3	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	26.5	26.6	0.0	40.4	11.5	13.6	13.6	8.7	8.8	8.8
LnGrp LOS	C	A	C	C	A	D	B	B	B	A	A	A
Approach Vol, veh/h	7			346			357			623		
Approach Delay, s/veh	26.7			39.9			13.6			8.8		
Approach LOS	C			D			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	50.0		26.9	5.7	58.8		26.9				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+I), s	19.7	7.2		20.7	2.1	5.9		2.8				
Green Ext Time (p_c), s	0.7	2.1		1.2	0.0	2.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	18.2											
HCM 6th LOS	B											

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	714	129	113	525	53	176	155	171	109	118	4
Future Volume (veh/h)	13	714	129	113	525	53	176	155	171	109	118	4
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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	14	752	136	119	553	56	251	221	244	160	174	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.70	0.70	0.70	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	4	4	4
Cap, veh/h	362	1037	188	255	1115	113	518	723	322	513	363	13
Arrive On Green	0.02	0.11	0.11	0.07	0.34	0.34	0.17	0.20	0.20	0.17	0.20	0.20
Sat Flow, veh/h	1781	3006	543	1767	3233	327	1767	3526	1572	1753	1769	61
Grp Volume(v), veh/h	14	444	444	119	301	308	251	221	244	160	0	180
Grp Sat Flow(s),veh/h/ln	1781	1777	1773	1767	1763	1797	1767	1763	1572	1753	0	1830
Q Serve(g_s), s	0.0	24.2	24.2	0.0	13.5	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Cycle Q Clear(g_c), s	0.0	24.2	24.2	0.0	13.5	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Prop In Lane	1.00		0.31	1.00		0.18	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	362	613	612	255	608	620	518	723	322	513	0	375
V/C Ratio(X)	0.04	0.73	0.73	0.47	0.49	0.50	0.48	0.31	0.76	0.31	0.00	0.48
Avail Cap(c_a), veh/h	393	613	612	286	608	620	518	723	322	513	0	375
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	39.7	39.7	40.7	25.9	25.9	30.9	33.7	37.4	27.7	0.0	35.0
Incr Delay (d2), s/veh	0.0	7.3	7.3	1.3	2.9	2.8	0.7	1.1	15.3	0.3	0.0	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(50%),veh/ln	0.3	12.7	12.6	2.8	6.0	6.1	5.1	2.4	6.9	3.1	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	47.0	47.1	42.0	28.7	28.7	31.6	34.8	52.7	28.0	0.0	39.4
LnGrp LOS	C	D	D	D	C	C	C	C	D	C	A	D
Approach Vol, veh/h	902			728			716			340		
Approach Delay, s/veh	46.8			30.9			39.8			34.0		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	40.0	22.8	25.0	12.2	40.0	22.8	25.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	34.5	34.5	15.5	20.5	8.5	34.5	15.5	20.5				
Max Q Clear Time (g_c+1.0), s	26.2	26.2	2.0	16.6	2.0	15.6	2.0	10.7				
Green Ext Time (p_c), s	0.1	3.5	0.3	0.9	0.0	3.5	0.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	39.0
HCM 6th LOS	D

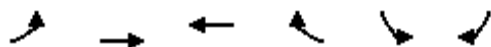
Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	27	333	275	0
Future Vol, veh/h	0	20	27	333	275	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	29	362	299	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	538	150	299	0	-	0
Stage 1	299	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	473	870	1259	-	-	-
Stage 1	726	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	462	870	1259	-	-	-
Mov Cap-2 Maneuver	548	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1259	-	870	-	-	
HCM Lane V/C Ratio	0.023	-	0.025	-	-	
HCM Control Delay (s)	7.9	-	9.2	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	2	351	277	18
Future Vol, veh/h	9	9	2	351	277	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	94	94	87	87
Heavy Vehicles, %	0	0	5	5	5	5
Mvmt Flow	15	15	2	373	318	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	520	170	339	0	-	0
Stage 1	329	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	491	851	1196	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	490	851	1196	-	-	-
Mov Cap-2 Maneuver	568	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1196	-	568	851	-	-
HCM Lane V/C Ratio	0.002	-	0.026	0.018	-	-
HCM Control Delay (s)	8	-	11.5	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑		↑	↑		
Traffic Volume (veh/h)	13	933	800	13	2	14		
Future Volume (Veh/h)	13	933	800	13	2	14		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	1.00	1.00	0.77	0.77	0.70	0.70		
Hourly flow rate (vph)	13	933	1039	17	3	20		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	None		TWLTL					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.81				0.81	0.81		
vC, conflicting volume	1056				1307	528		
vC1, stage 1 conf vol					1048			
vC2, stage 2 conf vol					259			
vCu, unblocked vol	594				905	0		
tC, single (s)	4.1				6.9	7.0		
tC, 2 stage (s)					5.9			
tF (s)	2.2				3.6	3.4		
p0 queue free %	98				99	98		
cM capacity (veh/h)	790				382	863		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	146	267	267	267	693	363	3	20
Volume Left	13	0	0	0	0	0	3	0
Volume Right	0	0	0	0	0	17	0	20
cSH	790	1700	1700	1700	1700	1700	382	863
Volume to Capacity	0.02	0.16	0.16	0.16	0.41	0.21	0.01	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	1	2
Control Delay (s)	1.0	0.0	0.0	0.0	0.0	0.0	14.5	9.3
Lane LOS	A						B	A
Approach Delay (s)	0.2				0.0		10.0	
Approach LOS								A
Intersection Summary								
Average Delay			0.2					
Intersection Capacity Utilization			32.5%		ICU Level of Service		A	
Analysis Period (min)			15					

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
No Build 2024 PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	590	221	182	776	26	184	395	217	60	522	132
Future Volume (veh/h)	192	590	221	182	776	26	184	395	217	60	522	132
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	202	621	0	192	817	27	222	476	261	71	621	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	333	1518		445	1523	50	197	539	294	186	628	159
Arrive On Green	0.07	0.43	0.00	0.02	0.14	0.14	0.07	0.24	0.24	0.05	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	1795	3538	117	1795	2237	1220	1795	2833	715
Grp Volume(v), veh/h	202	621	0	192	414	430	222	381	356	71	392	386
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1864	1795	1791	1666	1795	1791	1757
Q Serve(g_s), s	7.4	14.0	0.0	6.7	24.7	24.7	8.5	23.6	23.8	3.4	25.1	25.2
Cycle Q Clear(g_c), s	7.4	14.0	0.0	6.7	24.7	24.7	8.5	23.6	23.8	3.4	25.1	25.2
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.73	1.00		0.41
Lane Grp Cap(c), veh/h	333	1518		445	771	802	197	432	402	186	397	389
V/C Ratio(X)	0.61	0.41		0.43	0.54	0.54	1.13	0.88	0.89	0.38	0.99	0.99
Avail Cap(c_a), veh/h	333	1518		445	771	802	197	432	402	220	397	389
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	22.6	0.0	17.8	38.7	38.7	37.5	42.1	42.1	33.6	44.6	44.6
Incr Delay (d2), s/veh	3.1	0.8	0.0	0.7	2.7	2.6	101.9	18.7	20.7	1.3	41.8	42.9
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(50%),veh/ln	3.2	5.9	0.0	3.0	12.4	12.9	7.0	12.5	11.9	1.5	15.5	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	23.5	0.0	18.5	41.3	41.2	139.4	60.7	62.8	34.9	86.4	87.6
LnGrp LOS	C	C		B	D	D	F	E	E	C	F	F
Approach Vol, veh/h	823			1036			959			849		
Approach Delay, s/veh	23.3			37.1			79.7			82.6		
Approach LOS	C			D			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	33.2	15.0	55.0	14.0	31.0	15.0	55.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	8.5	25.5	8.5	49.5	8.5	25.5	8.5	49.5				
Max Q Clear Time (g_c+I1), s	5.4	25.8	9.4	26.7	10.5	27.2	8.7	16.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.4	0.0	0.0	0.0	4.6				

Intersection Summary

HCM 6th Ctrl Delay 55.7
HCM 6th LOS E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
No Build 2024 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	5	9	10	20	5	348	3	558	11	351	695	3
Future Volume (veh/h)	5	9	10	20	5	348	3	558	11	351	695	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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	8	14	15	23	6	400	3	594	12	399	790	3
Peak Hour Factor	0.66	0.66	0.66	0.87	0.87	0.87	0.94	0.94	0.94	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	188	312	354	375	91	441	381	1569	32	594	2103	8
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.44	0.44	0.14	0.57	0.57
Sat Flow, veh/h	507	1137	1291	1140	332	1610	1795	3591	73	1795	3660	14
Grp Volume(v), veh/h	20	0	17	29	0	400	3	296	310	399	387	406
Grp Sat Flow(s),veh/h/ln	1439	0	1497	1472	0	1610	1795	1791	1872	1795	1791	1883
Q Serve(g_s), s	0.0	0.0	0.9	0.8	0.0	24.7	0.1	11.5	11.5	11.8	12.1	12.1
Cycle Q Clear(g_c), s	0.8	0.0	0.9	1.7	0.0	24.7	0.1	11.5	11.5	11.8	12.1	12.1
Prop In Lane	0.41		0.86	0.79		1.00	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	443	0	410	466	0	441	381	783	818	594	1029	1082
V/C Ratio(X)	0.04	0.00	0.04	0.06	0.00	0.91	0.01	0.38	0.38	0.67	0.38	0.38
Avail Cap(c_a), veh/h	669	0	654	708	0	704	807	783	818	773	1029	1082
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	27.5	27.7	0.0	36.1	16.0	19.5	19.5	12.3	11.9	11.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	10.3	0.0	1.4	1.3	1.5	1.0	1.0
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(50%),veh/ln	0.4	0.0	0.3	0.5	0.0	10.9	0.0	4.9	5.1	4.5	4.8	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	0.0	27.5	27.8	0.0	46.4	16.0	20.9	20.9	13.8	12.9	12.9
LnGrp LOS	C	A	C	C	A	D	B	C	C	B	B	B
Approach Vol, veh/h		37			429			609			1192	
Approach Delay, s/veh		27.5			45.1			20.9			13.2	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.7	50.0		33.2	5.6	64.2		33.2				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+I), s	11.8	13.5		26.7	2.1	14.1		2.9				
Green Ext Time (p_c), s	1.0	3.8		1.5	0.0	5.3		0.2				

Intersection Summary

HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
No Build 2024 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	750	168	171	832	91	125	157	115	122	179	14
Future Volume (veh/h)	27	750	168	171	832	91	125	157	115	122	179	14
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	30	833	187	188	914	100	151	189	139	156	229	18
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.83	0.83	0.83	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	239	1066	239	221	1203	132	489	701	313	566	338	27
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2883	647	1795	3256	356	1795	3582	1598	1795	1725	136
Grp Volume(v), veh/h	30	513	507	188	503	511	151	189	139	156	0	247
Grp Sat Flow(s),veh/h/ln	1781	1777	1754	1795	1791	1821	1795	1791	1598	1795	0	1861
Q Serve(g_s), s	0.0	32.2	32.2	4.6	28.3	28.3	0.0	5.2	8.8	0.0	0.0	14.2
Cycle Q Clear(g_c), s	0.0	32.2	32.2	4.6	28.3	28.3	0.0	5.2	8.8	0.0	0.0	14.2
Prop In Lane	1.00		0.37	1.00		0.20	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	239	657	648	221	662	673	489	701	313	566	0	364
V/C Ratio(X)	0.13	0.78	0.78	0.85	0.76	0.76	0.31	0.27	0.44	0.28	0.00	0.68
Avail Cap(c_a), veh/h	402	657	648	385	662	673	489	701	313	566	0	364
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	46.0	46.0	50.2	31.8	31.8	35.3	39.3	40.7	29.2	0.0	42.9
Incr Delay (d2), s/veh	0.2	9.0	9.1	8.8	8.0	7.9	0.4	0.9	4.5	0.3	0.0	9.8
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(50%),veh/ln	0.8	17.0	16.8	5.8	13.4	13.6	3.5	2.4	3.9	3.4	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.5	55.0	55.1	58.9	39.8	39.7	35.7	40.2	45.3	29.4	0.0	52.7
LnGrp LOS	D	D	E	E	D	D	D	D	D	C	A	D
Approach Vol, veh/h	1050			1202			479			403		
Approach Delay, s/veh	54.7			42.7			40.2			43.7		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	48.0	27.5	27.0	12.5	48.0	27.5	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	17.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+I), s	10.6	34.2	2.0	10.8	2.0	30.3	2.0	16.2				
Green Ext Time (p_c), s	0.4	4.0	0.3	1.2	0.0	5.1	0.3	0.7				

Intersection Summary

HCM 6th Ctrl Delay	46.5
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	53	572	725	0
Future Vol, veh/h	0	10	53	572	725	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	58	622	788	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1215	394	788	0	-	0
Stage 1	788	-	-	-	-	-
Stage 2	427	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	174	605	827	-	-	-
Stage 1	409	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	162	605	827	-	-	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	380	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.1	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	827	-	605	-	-	
HCM Lane V/C Ratio	0.07	-	0.018	-	-	
HCM Control Delay (s)	9.7	-	11.1	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	33	5	608	681	54
Future Vol, veh/h	17	33	5	608	681	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	23	44	5	654	841	67

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1212	454	908	0	-	0
Stage 1	875	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	175	553	758	-	-	-
Stage 1	368	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	174	553	758	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	365	-	-	-	-	-
Stage 2	695	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	758	-	286	553	-	-
HCM Lane V/C Ratio	0.007	-	0.079	0.08	-	-
HCM Control Delay (s)	9.8	-	18.7	12.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.3	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
No Build 2024 PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑		↖	↗		
Traffic Volume (veh/h)	46	974	1061	31	29	56		
Future Volume (Veh/h)	46	974	1061	31	29	56		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.94	0.94	0.92	0.92	0.72	0.72		
Hourly flow rate (vph)	49	1036	1153	34	40	78		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLT					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.82				0.82	0.82		
vC, conflicting volume	1187				1527	594		
vC1, stage 1 conf vol					1170			
vC2, stage 2 conf vol					357			
vCu, unblocked vol	793				1207	71		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	93				87	90		
cM capacity (veh/h)	677				313	806		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	197	296	296	296	769	418	40	78
Volume Left	49	0	0	0	0	0	40	0
Volume Right	0	0	0	0	0	34	0	78
cSH	677	1700	1700	1700	1700	1700	313	806
Volume to Capacity	0.07	0.17	0.17	0.17	0.45	0.25	0.13	0.10
Queue Length 95th (ft)	6	0	0	0	0	0	11	8
Control Delay (s)	3.3	0.0	0.0	0.0	0.0	0.0	18.2	9.9
Lane LOS	A						C	A
Approach Delay (s)	0.6				0.0		12.7	
Approach LOS							B	
Intersection Summary								
Average Delay			0.9					
Intersection Capacity Utilization			58.3%		ICU Level of Service			B
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	123	216	239	220	259	293	140	150	157	57	161	111
Average Queue (ft)	29	127	122	52	140	151	47	82	75	6	67	57
95th Queue (ft)	78	216	214	126	233	257	100	145	137	25	118	105
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		0	0	0	1	2						
Queuing Penalty (veh)		1	1	0	4	9						
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	1						0	
Queuing Penalty (veh)				0	1						0	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	54	53	55	123	31	137	143	131	85	62
Average Queue (ft)	4	5	7	60	3	39	36	56	24	11
95th Queue (ft)	26	27	33	103	18	88	98	103	53	38
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						0				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	B18	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	T	L
Maximum Queue (ft)	52	312	349	172	261	244	124	224	182	125	30	113
Average Queue (ft)	7	181	187	58	107	62	94	38	62	50	1	63
95th Queue (ft)	32	261	282	122	190	146	138	142	122	90	10	97
Link Distance (ft)		240	240		855	855		178	178		228	342
Upstream Blk Time (%)		1	2					1	0			
Queuing Penalty (veh)		5	10					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		11		0	1		15	0	2	0		
Queuing Penalty (veh)		1		0	1		13	0	4	0		

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	SB
Directions Served	TR
Maximum Queue (ft)	178
Average Queue (ft)	63
95th Queue (ft)	142
Link Distance (ft)	342
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	31	31
Average Queue (ft)	12	5
95th Queue (ft)	36	24
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB
Directions Served	L	R
Maximum Queue (ft)	29	31
Average Queue (ft)	1	5
95th Queue (ft)	10	24
Link Distance (ft)		222
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	92	31	55
Average Queue (ft)	10	1	15
95th Queue (ft)	46	10	45
Link Distance (ft)	80		370
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 52

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	121	216	244	220	330	293	300	490	396	174	291	292
Average Queue (ft)	76	135	118	143	232	222	170	185	184	58	195	200
95th Queue (ft)	125	192	189	258	312	280	290	378	322	160	318	323
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		0	1	0	11	10		0			15	17
Queuing Penalty (veh)		0	2	0	56	48		0			59	64
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	11		6				26	
Queuing Penalty (veh)				2	21		11				16	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	T	TR	L	T	TR
Maximum Queue (ft)	30	30	54	152	161	183	226	155	196
Average Queue (ft)	4	11	21	87	81	82	89	57	43
95th Queue (ft)	21	33	50	140	158	160	159	117	109
Link Distance (ft)	457	457	484	484	207	207	868	868	868
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)									
Storage Blk Time (%)					1				
Queuing Penalty (veh)					0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	310	312	200	366	289	124	213	202	125	184	200
Average Queue (ft)	47	212	218	111	204	139	81	51	77	50	86	107
95th Queue (ft)	134	319	322	222	334	250	134	154	143	102	152	178
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		5	6					1	1			
Queuing Penalty (veh)		24	27					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)	0	13		2	8		11	1	4	0		
Queuing Penalty (veh)	0	4		9	15		8	1	5	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	31	50
Average Queue (ft)	8	18
95th Queue (ft)	31	45
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	81	52	30	105	140
Average Queue (ft)	23	21	3	17	15
95th Queue (ft)	61	48	16	69	70
Link Distance (ft)		222		322	322
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)	4		0		
Queuing Penalty (veh)	2		0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	97	22	95	54
Average Queue (ft)	31	1	25	33
95th Queue (ft)	81	10	65	50
Link Distance (ft)	80	210		370
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 374

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
Build Out 2024 AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	725	133	140	657	13	90	259	113	20	221	70
Future Volume (veh/h)	87	725	133	140	657	13	90	259	113	20	221	70
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	1870	1870	1870	1856	1856	1856	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	118	980	0	187	876	17	105	301	131	24	260	82
Peak Hour Factor	0.74	0.74	0.74	0.75	0.75	0.75	0.86	0.86	0.86	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	5	5	5	3	3	3
Cap, veh/h	363	1767		371	1770	34	229	399	170	174	356	110
Arrive On Green	0.07	0.50	0.00	0.02	0.17	0.17	0.07	0.17	0.17	0.03	0.13	0.13
Sat Flow, veh/h	1781	3554	1585	1767	3537	69	1739	2371	1008	1767	2653	818
Grp Volume(v), veh/h	118	980	0	187	437	456	105	218	214	24	171	171
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1767	1763	1843	1739	1735	1644	1767	1763	1708
Q Serve(g_s), s	3.1	19.1	0.0	5.0	22.5	22.5	5.1	12.0	12.4	1.1	9.3	9.6
Cycle Q Clear(g_c), s	3.1	19.1	0.0	5.0	22.5	22.5	5.1	12.0	12.4	1.1	9.3	9.6
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.61	1.00		0.48
Lane Grp Cap(c), veh/h	363	1767		371	882	922	229	292	277	174	236	229
V/C Ratio(X)	0.32	0.55		0.50	0.49	0.49	0.46	0.75	0.77	0.14	0.72	0.75
Avail Cap(c_a), veh/h	413	1767		414	882	922	310	512	485	317	520	504
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	17.5	0.0	13.9	30.3	30.3	34.4	39.6	39.8	35.5	41.5	41.7
Incr Delay (d2), s/veh	0.5	1.3	0.0	1.1	2.0	1.9	1.4	3.8	4.6	0.4	4.1	4.8
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(50%),veh/ln	1.2	7.6	0.0	2.1	11.0	11.5	2.2	5.3	5.3	0.5	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	18.7	0.0	15.0	32.2	32.2	35.8	43.4	44.3	35.8	45.6	46.5
LnGrp LOS	B	B		B	C	C	D	D	D	D	D	D
Approach Vol, veh/h	1098				1080				537		366	
Approach Delay, s/veh	18.2				29.2				42.3		45.4	
Approach LOS	B				C				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	22.3	13.2	55.5	12.3	18.9	13.6	55.2				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	11.5	29.5	9.5	26.5	11.5	29.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	3.1	14.4	5.1	24.5	7.1	11.6	7.0	21.1				
Green Ext Time (p_c), s	0.0	2.2	0.1	1.1	0.1	1.8	0.1	2.9				

Intersection Summary

HCM 6th Ctrl Delay	29.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
Build Out 2024 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	2	0	3	6	4	243	4	319	34	232	272	7
Future Volume (veh/h)	2	0	3	6	4	243	4	319	34	232	272	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	1411	1411	1411	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	3	0	4	8	5	333	4	343	37	286	336	9
Peak Hour Factor	0.75	0.75	0.75	0.73	0.73	0.73	0.93	0.93	0.93	0.81	0.81	0.81
Percent Heavy Veh, %	33	33	33	3	3	3	4	4	4	3	3	3
Cap, veh/h	263	0	261	279	160	377	594	1569	168	691	2065	55
Arrive On Green	0.24	0.00	0.24	0.24	0.24	0.24	0.01	0.49	0.49	0.10	0.59	0.59
Sat Flow, veh/h	769	0	1088	898	667	1572	1753	3187	341	1767	3508	94
Grp Volume(v), veh/h	3	0	4	13	0	333	4	187	193	286	169	176
Grp Sat Flow(s),veh/h/ln	769	0	1088	1565	0	1572	1753	1749	1779	1767	1763	1839
Q Serve(g_s), s	0.3	0.0	0.3	0.0	0.0	18.7	0.1	5.6	5.6	6.7	4.0	4.0
Cycle Q Clear(g_c), s	0.8	0.0	0.3	0.5	0.0	18.7	0.1	5.6	5.6	6.7	4.0	4.0
Prop In Lane	1.00		1.00	0.62		1.00	1.00		0.19	1.00		0.05
Lane Grp Cap(c), veh/h	263	0	261	439	0	377	594	861	876	691	1038	1083
V/C Ratio(X)	0.01	0.00	0.02	0.03	0.00	0.88	0.01	0.22	0.22	0.41	0.16	0.16
Avail Cap(c_a), veh/h	462	0	536	830	0	775	1061	861	876	991	1038	1083
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	26.5	26.6	0.0	33.5	11.5	13.2	13.2	8.4	8.5	8.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.6	0.6	0.4	0.3	0.3
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(50%),veh/ln	0.1	0.0	0.1	0.2	0.0	7.7	0.0	2.2	2.3	2.3	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	26.5	26.6	0.0	40.4	11.5	13.8	13.8	8.8	8.9	8.9
LnGrp LOS	C	A	C	C	A	D	B	B	B	A	A	A
Approach Vol, veh/h		7			346			384			631	
Approach Delay, s/veh		26.7			39.9			13.7			8.8	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	50.0		26.9	5.7	58.8		26.9				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+I), s	19.7	7.6		20.7	2.1	6.0		2.8				
Green Ext Time (p_c), s	0.7	2.3		1.2	0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			18.2									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
Build Out 2024 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	734	129	113	528	53	177	155	171	109	118	4
Future Volume (veh/h)	13	734	129	113	528	53	177	155	171	109	118	4
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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	14	773	136	119	556	56	253	221	244	160	174	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.70	0.70	0.70	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	4	4	4
Cap, veh/h	361	1042	183	250	1116	112	518	723	322	513	363	13
Arrive On Green	0.02	0.11	0.11	0.07	0.34	0.34	0.17	0.20	0.20	0.17	0.20	0.20
Sat Flow, veh/h	1781	3020	531	1767	3235	325	1767	3526	1572	1753	1769	61
Grp Volume(v), veh/h	14	455	454	119	302	310	253	221	244	160	0	180
Grp Sat Flow(s),veh/h/ln	1781	1777	1775	1767	1763	1797	1767	1763	1572	1753	0	1830
Q Serve(g_s), s	0.0	24.8	24.8	0.0	13.6	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Cycle Q Clear(g_c), s	0.0	24.8	24.8	0.0	13.6	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Prop In Lane	1.00		0.30	1.00		0.18	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	361	613	612	250	608	620	518	723	322	513	0	375
V/C Ratio(X)	0.04	0.74	0.74	0.48	0.50	0.50	0.49	0.31	0.76	0.31	0.00	0.48
Avail Cap(c_a), veh/h	392	613	612	281	608	620	518	723	322	513	0	375
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	40.0	40.0	41.1	25.9	25.9	30.9	33.7	37.4	27.7	0.0	35.0
Incr Delay (d2), s/veh	0.0	7.9	7.9	1.4	2.9	2.9	0.7	1.1	15.3	0.3	0.0	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(50%),veh/ln	0.3	13.1	13.0	2.8	6.0	6.1	5.2	2.4	6.9	3.1	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	47.9	47.9	42.5	28.8	28.8	31.6	34.8	52.7	28.0	0.0	39.4
LnGrp LOS	C	D	D	D	C	C	C	C	D	C	A	D
Approach Vol, veh/h	923			731			718			340		
Approach Delay, s/veh	47.6			31.0			39.8			34.0		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	40.0	22.8	25.0	12.2	40.0	22.8	25.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	34.5	34.5	15.5	20.5	8.5	34.5	15.5	20.5				
Max Q Clear Time (g_c+I_2), s	26.8	26.8	2.0	16.6	2.0	15.6	2.0	10.7				
Green Ext Time (p_c), s	0.1	3.4	0.3	0.9	0.0	3.5	0.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	30	29	347	279	2
Future Vol, veh/h	10	30	29	347	279	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	33	32	377	303	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	557	153	305	0	-	0
Stage 1	304	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	460	866	1253	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	448	866	1253	-	-	-
Mov Cap-2 Maneuver	538	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.1	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1253	-	751	-	-	
HCM Lane V/C Ratio	0.025	-	0.058	-	-	
HCM Control Delay (s)	7.9	-	10.1	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	25	7	352	286	23
Future Vol, veh/h	24	25	7	352	286	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	94	94	87	87
Heavy Vehicles, %	0	0	5	5	5	5
Mvmt Flow	40	42	7	374	329	26

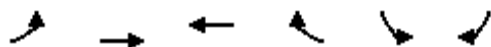
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	543	178	355	0	-	0
Stage 1	342	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	475	841	1179	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	472	841	1179	-	-	-
Mov Cap-2 Maneuver	554	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1179	-	554	841	-	-
HCM Lane V/C Ratio	0.006	-	0.072	0.05	-	-
HCM Control Delay (s)	8.1	-	12	9.5	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.2	-	-

HCM Unsignalized Intersection Capacity Analysis 15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
Build Out 2024 AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Traffic Volume (veh/h)	19	933	800	17	12	27		
Future Volume (Veh/h)	19	933	800	17	12	27		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	1.00	1.00	0.77	0.77	0.70	0.70		
Hourly flow rate (vph)	19	933	1039	22	17	39		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.80				0.80	0.80		
vC, conflicting volume	1061				1321	530		
vC1, stage 1 conf vol					1050			
vC2, stage 2 conf vol					271			
vCu, unblocked vol	588				912	0		
tC, single (s)	4.1				6.9	7.0		
tC, 2 stage (s)					5.9			
tF (s)	2.2				3.6	3.4		
p0 queue free %	98				96	95		
cM capacity (veh/h)	790				382	859		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	152	267	267	267	693	368	17	39
Volume Left	19	0	0	0	0	0	17	0
Volume Right	0	0	0	0	0	22	0	39
cSH	790	1700	1700	1700	1700	1700	382	859
Volume to Capacity	0.02	0.16	0.16	0.16	0.41	0.22	0.04	0.05
Queue Length 95th (ft)	2	0	0	0	0	0	3	4
Control Delay (s)	1.4	0.0	0.0	0.0	0.0	0.0	14.9	9.4
Lane LOS	A						B	A
Approach Delay (s)	0.2				0.0		11.1	
Approach LOS							B	
Intersection Summary								
Average Delay			0.4					
Intersection Capacity Utilization			36.8%		ICU Level of Service			A
Analysis Period (min)			15					

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
Build Out 2024 PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	595	221	182	789	27	187	416	237	62	539	132
Future Volume (veh/h)	192	595	221	182	789	27	187	416	237	62	539	132
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	202	626	0	192	831	28	225	501	286	74	642	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	328	1518		443	1522	51	195	529	301	172	633	155
Arrive On Green	0.07	0.43	0.00	0.02	0.14	0.14	0.07	0.24	0.24	0.06	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	1795	3536	119	1795	2200	1251	1795	2854	697
Grp Volume(v), veh/h	202	626	0	192	421	438	225	408	379	74	403	396
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1864	1795	1791	1660	1795	1791	1760
Q Serve(g_s), s	7.4	14.1	0.0	6.7	25.1	25.1	8.5	25.7	25.9	3.6	25.5	25.5
Cycle Q Clear(g_c), s	7.4	14.1	0.0	6.7	25.1	25.1	8.5	25.7	25.9	3.6	25.5	25.5
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.75	1.00		0.40
Lane Grp Cap(c), veh/h	328	1518		443	771	802	195	431	399	172	397	390
V/C Ratio(X)	0.62	0.41		0.43	0.55	0.55	1.15	0.95	0.95	0.43	1.01	1.02
Avail Cap(c_a), veh/h	328	1518		443	771	802	195	431	399	206	397	390
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	22.7	0.0	17.8	38.9	38.9	37.3	42.9	43.0	34.1	44.8	44.8
Incr Delay (d2), s/veh	3.4	0.8	0.0	0.7	2.8	2.7	111.3	30.0	32.5	1.7	48.7	49.6
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(50%),veh/ln	3.2	5.9	0.0	3.0	12.6	13.1	7.4	14.8	14.0	1.6	16.5	16.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	23.5	0.0	18.5	41.7	41.5	148.6	73.0	75.5	35.7	93.4	94.4
LnGrp LOS	C	C		B	D	D	F	E	E	D	F	F
Approach Vol, veh/h	828			1051			1012			873		
Approach Delay, s/veh	23.5			37.4			90.7			89.0		
Approach LOS	C			D			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	33.2	15.0	55.0	14.0	31.0	15.0	55.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	8.5	25.5	8.5	49.5	8.5	25.5	8.5	49.5				
Max Q Clear Time (g_c+I1), s	5.6	27.9	9.4	27.1	10.5	27.5	8.7	16.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.5	0.0	0.0	0.0	4.6				

Intersection Summary

HCM 6th Ctrl Delay 60.6
HCM 6th LOS E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
Build Out 2024 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	5	9	10	21	5	348	3	572	11	351	718	3
Future Volume (veh/h)	5	9	10	21	5	348	3	572	11	351	718	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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	8	14	15	24	6	400	3	609	12	399	816	3
Peak Hour Factor	0.66	0.66	0.66	0.87	0.87	0.87	0.94	0.94	0.94	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	188	312	354	377	88	441	374	1570	31	588	2103	8
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.44	0.44	0.14	0.57	0.57
Sat Flow, veh/h	507	1137	1291	1147	320	1610	1795	3593	71	1795	3660	13
Grp Volume(v), veh/h	20	0	17	30	0	400	3	303	318	399	399	420
Grp Sat Flow(s),veh/h/ln	1439	0	1497	1468	0	1610	1795	1791	1872	1795	1791	1883
Q Serve(g_s), s	0.0	0.0	0.9	0.9	0.0	24.7	0.1	11.8	11.8	11.8	12.6	12.6
Cycle Q Clear(g_c), s	0.8	0.0	0.9	1.8	0.0	24.7	0.1	11.8	11.8	11.8	12.6	12.6
Prop In Lane	0.41		0.86	0.80		1.00	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	443	0	410	465	0	441	374	783	818	588	1029	1082
V/C Ratio(X)	0.04	0.00	0.04	0.06	0.00	0.91	0.01	0.39	0.39	0.68	0.39	0.39
Avail Cap(c_a), veh/h	669	0	654	706	0	704	800	783	818	766	1029	1082
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	27.4	27.8	0.0	36.1	16.0	19.6	19.6	12.4	12.0	12.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	10.3	0.0	1.4	1.4	1.6	1.1	1.1
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(50%),veh/ln	0.4	0.0	0.3	0.6	0.0	10.9	0.0	5.1	5.3	4.5	5.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	0.0	27.5	27.8	0.0	46.4	16.0	21.1	21.0	14.0	13.1	13.0
LnGrp LOS	C	A	C	C	A	D	B	C	C	B	B	B
Approach Vol, veh/h		37			430			624			1218	
Approach Delay, s/veh		27.5			45.1			21.0			13.4	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.7	50.0		33.2	5.6	64.2		33.2				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+I), s	11.8	13.8		26.7	2.1	14.6		2.9				
Green Ext Time (p_c), s	1.0	3.9		1.5	0.0	5.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			21.6									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
Build Out 2024 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	777	168	171	843	91	127	157	115	123	179	14
Future Volume (veh/h)	27	777	168	171	843	91	127	157	115	123	179	14
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	30	863	187	188	926	100	153	189	139	158	229	18
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.83	0.83	0.83	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	242	1073	233	221	1205	130	484	701	313	561	338	27
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2905	629	1795	3261	352	1795	3582	1598	1795	1725	136
Grp Volume(v), veh/h	30	528	522	188	509	517	153	189	139	158	0	247
Grp Sat Flow(s),veh/h/ln	1781	1777	1757	1795	1791	1822	1795	1791	1598	1795	0	1861
Q Serve(g_s), s	0.0	33.3	33.3	5.0	28.8	28.8	0.0	5.2	8.8	0.0	0.0	14.2
Cycle Q Clear(g_c), s	0.0	33.3	33.3	5.0	28.8	28.8	0.0	5.2	8.8	0.0	0.0	14.2
Prop In Lane	1.00		0.36	1.00		0.19	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	242	657	649	221	662	673	484	701	313	561	0	364
V/C Ratio(X)	0.12	0.80	0.80	0.85	0.77	0.77	0.32	0.27	0.44	0.28	0.00	0.68
Avail Cap(c_a), veh/h	399	657	649	379	662	673	484	701	313	561	0	364
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.5	46.4	46.4	50.3	31.9	31.9	35.6	39.3	40.7	29.5	0.0	42.9
Incr Delay (d2), s/veh	0.2	10.1	10.2	9.0	8.4	8.2	0.4	0.9	4.5	0.3	0.0	9.8
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(50%),veh/ln	0.8	17.7	17.5	5.8	13.6	13.8	3.6	2.4	3.9	3.4	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	56.5	56.6	59.2	40.3	40.1	36.0	40.2	45.3	29.8	0.0	52.7
LnGrp LOS	D	E	E	E	D	D	D	D	D	C	A	D
Approach Vol, veh/h	1080			1214			481			405		
Approach Delay, s/veh	56.2			43.2			40.3			43.7		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.8	48.0	27.2	27.0	12.8	48.0	27.2	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	42.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+17), s	35.3	35.3	2.0	10.8	2.0	30.8	2.0	16.2				
Green Ext Time (p_c), s	0.4	3.7	0.3	1.2	0.0	5.0	0.3	0.7				

Intersection Summary

HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	17	61	580	741	8
Future Vol, veh/h	6	17	61	580	741	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	18	66	630	805	9

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1257	407	814
Stage 1	810	-	-
Stage 2	447	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	163	593	809
Stage 1	398	-	-
Stage 2	611	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	150	593	809
Mov Cap-2 Maneuver	271	-	-
Stage 1	365	-	-
Stage 2	611	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	809	-	453	-	-
HCM Lane V/C Ratio	0.082	-	0.055	-	-
HCM Control Delay (s)	9.8	-	13.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	45	19	616	688	70
Future Vol, veh/h	25	45	19	616	688	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	33	60	20	662	849	86
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1263	468	935	0	-	0
Stage 1	892	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	162	542	741	-	-	-
Stage 1	361	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	158	542	741	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	351	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.2	0.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	741	-	272	542	-	-
HCM Lane V/C Ratio	0.028	-	0.123	0.111	-	-
HCM Control Delay (s)	10	-	20.1	12.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.4	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
Build Out 2024 PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↓		↖	↗		
Traffic Volume (veh/h)	61	974	1062	46	34	64		
Future Volume (Veh/h)	61	974	1062	46	34	64		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.94	0.94	0.92	0.92	0.72	0.72		
Hourly flow rate (vph)	65	1036	1154	50	47	89		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage veh			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.82				0.82	0.82		
vC, conflicting volume	1204				1568	602		
vC1, stage 1 conf vol					1179			
vC2, stage 2 conf vol					389			
vCu, unblocked vol	802				1248	66		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	90				85	89		
cM capacity (veh/h)	668				307	807		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	213	296	296	296	769	435	47	89
Volume Left	65	0	0	0	0	0	47	0
Volume Right	0	0	0	0	0	50	0	89
cSH	668	1700	1700	1700	1700	1700	307	807
Volume to Capacity	0.10	0.17	0.17	0.17	0.45	0.26	0.15	0.11
Queue Length 95th (ft)	8	0	0	0	0	0	13	9
Control Delay (s)	4.2	0.0	0.0	0.0	0.0	0.0	18.9	10.0
Lane LOS	A						C	B
Approach Delay (s)	0.8				0.0		13.1	
Approach LOS							B	
Intersection Summary								
Average Delay			1.1					
Intersection Capacity Utilization			59.2%		ICU Level of Service			B
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	61	300	269	167	210	220	88	192	181	39	119	131
Average Queue (ft)	22	134	123	60	119	133	37	77	70	7	63	61
95th Queue (ft)	49	250	246	132	204	221	77	151	144	22	109	114
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		3	3		0	1						
Queuing Penalty (veh)		8	7		0	2						
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)					0							
Queuing Penalty (veh)					0							

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	16	66	31	166	31	97	111	152	65	46
Average Queue (ft)	1	3	9	64	3	52	39	48	23	8
95th Queue (ft)	5	25	31	125	19	93	89	97	59	30
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)					150					
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	B18	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	T	L
Maximum Queue (ft)	30	282	330	131	235	189	124	245	188	125	80	182
Average Queue (ft)	6	179	195	54	102	59	89	57	68	66	3	63
95th Queue (ft)	25	273	295	104	181	132	140	172	146	118	27	127
Link Distance (ft)		240	240		855	855		178	178		228	342
Upstream Blk Time (%)		2	3					2	0			
Queuing Penalty (veh)		11	12					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		12			1		12	0	4	2		
Queuing Penalty (veh)		2			1		11	0	7	2		

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	SB
Directions Served	TR
Maximum Queue (ft)	94
Average Queue (ft)	43
95th Queue (ft)	88
Link Distance (ft)	342
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	50	31
Average Queue (ft)	22	3
95th Queue (ft)	49	18
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	31	31
Average Queue (ft)	18	13	3
95th Queue (ft)	43	38	18
Link Distance (ft)	222		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	75		50
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	31	31	55
Average Queue (ft)	4	9	22
95th Queue (ft)	22	32	52
Link Distance (ft)	80		354
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 63

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	186	219	196	220	293	297	300	538	519	174	291	292
Average Queue (ft)	93	136	121	161	240	241	196	285	305	60	208	217
95th Queue (ft)	166	191	179	271	315	320	360	607	594	170	310	312
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		0	0	0	12	17		21	7		18	20
Queuing Penalty (veh)		1	0	0	63	86		0	0		76	83
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	12		38	1		0	33	
Queuing Penalty (veh)				1	23		86	2		0	22	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	49	74	257	31	254	245	206	170	151
Average Queue (ft)	2	14	20	99	2	78	78	93	61	55
95th Queue (ft)	12	39	56	197	15	154	161	166	133	122
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)						1	1			
Queuing Penalty (veh)						4	2			
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						1				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	52	335	312	200	298	225	123	164	217	125	266	224
Average Queue (ft)	17	226	242	109	176	134	80	42	100	62	97	114
95th Queue (ft)	44	318	339	197	267	214	133	122	183	127	173	199
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		7	10					0	1			
Queuing Penalty (veh)		32	48					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		15		0	7		13	0	7	1		
Queuing Penalty (veh)		4		2	12		11	0	9	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	50	48
Average Queue (ft)	10	21
95th Queue (ft)	36	45
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	100	195	31	168	205
Average Queue (ft)	30	47	15	25	28
95th Queue (ft)	74	126	40	100	113
Link Distance (ft)		222		322	322
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)	8	9	0		
Queuing Penalty (veh)	5	3	0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	141	114	55
Average Queue (ft)	36	22	38
95th Queue (ft)	95	62	62
Link Distance (ft)	80		354
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 574

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

01/13/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	595	221	182	789	27	187	416	237	62	539	132
Future Volume (veh/h)	192	595	221	182	789	27	187	416	237	62	539	132
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	202	626	0	192	831	28	225	501	286	74	642	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	301	1457		411	1461	49	223	586	333	196	682	167
Arrive On Green	0.07	0.41	0.00	0.02	0.14	0.14	0.08	0.27	0.27	0.06	0.24	0.24
Sat Flow, veh/h	1767	3526	1572	1795	3536	119	1795	2200	1251	1795	2854	697
Grp Volume(v), veh/h	202	626	0	192	421	438	225	408	379	74	403	396
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1864	1795	1791	1660	1795	1791	1760
Q Serve(g_s), s	7.5	14.6	0.0	7.0	25.3	25.3	9.5	24.9	25.0	3.5	25.4	25.4
Cycle Q Clear(g_c), s	7.5	14.6	0.0	7.0	25.3	25.3	9.5	24.9	25.0	3.5	25.4	25.4
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.75	1.00		0.40
Lane Grp Cap(c), veh/h	301	1457		411	740	770	223	477	442	196	428	420
V/C Ratio(X)	0.67	0.43		0.47	0.57	0.57	1.01	0.85	0.86	0.38	0.94	0.94
Avail Cap(c_a), veh/h	301	1457		411	740	770	223	477	442	245	428	421
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	24.1	0.0	19.6	40.1	40.1	36.0	40.1	40.1	32.2	43.0	43.0
Incr Delay (d2), s/veh	5.7	0.9	0.0	0.8	3.2	3.0	62.6	14.1	15.4	1.2	29.0	29.8
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(50%),veh/ln	3.5	6.1	0.0	3.1	12.8	13.3	8.6	12.6	11.9	1.6	14.5	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	25.0	0.0	20.4	43.2	43.1	98.6	54.1	55.5	33.4	72.0	72.8
LnGrp LOS	C	C		C	D	D	F	D	E	C	E	E
Approach Vol, veh/h	828			1051			1012			873		
Approach Delay, s/veh	25.7			39.0			64.5			69.1		
Approach LOS	C			D			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	36.1	14.0	53.0	15.0	33.0	14.0	53.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	9.5	27.5	7.5	47.5	9.5	27.5	7.5	47.5				
Max Q Clear Time (g_c+I1), s	5.5	27.0	9.5	27.3	11.5	27.4	9.0	16.6				
Green Ext Time (p_c), s	0.0	0.3	0.0	5.3	0.0	0.0	0.0	4.5				

Intersection Summary

HCM 6th Ctrl Delay	49.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

01/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	5	9	10	21	5	348	3	572	11	351	718	3
Future Volume (veh/h)	5	9	10	21	5	348	3	572	11	351	718	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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	8	14	15	24	6	400	3	609	12	399	816	3
Peak Hour Factor	0.66	0.66	0.66	0.87	0.87	0.87	0.94	0.94	0.94	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	188	312	354	377	88	441	374	1570	31	588	2103	8
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.44	0.44	0.14	0.57	0.57
Sat Flow, veh/h	507	1137	1291	1147	320	1610	1795	3593	71	1795	3660	13
Grp Volume(v), veh/h	20	0	17	30	0	400	3	303	318	399	399	420
Grp Sat Flow(s),veh/h/ln	1439	0	1497	1468	0	1610	1795	1791	1872	1795	1791	1883
Q Serve(g_s), s	0.0	0.0	0.9	0.9	0.0	24.7	0.1	11.8	11.8	11.8	12.6	12.6
Cycle Q Clear(g_c), s	0.8	0.0	0.9	1.8	0.0	24.7	0.1	11.8	11.8	11.8	12.6	12.6
Prop In Lane	0.41		0.86	0.80		1.00	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	443	0	410	465	0	441	374	783	818	588	1029	1082
V/C Ratio(X)	0.04	0.00	0.04	0.06	0.00	0.91	0.01	0.39	0.39	0.68	0.39	0.39
Avail Cap(c_a), veh/h	669	0	654	706	0	704	800	783	818	766	1029	1082
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	27.4	27.8	0.0	36.1	16.0	19.6	19.6	12.4	12.0	12.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	10.3	0.0	1.4	1.4	1.6	1.1	1.1
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(50%),veh/ln	0.4	0.0	0.3	0.6	0.0	10.9	0.0	5.1	5.3	4.5	5.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	0.0	27.5	27.8	0.0	46.4	16.0	21.1	21.0	14.0	13.1	13.0
LnGrp LOS	C	A	C	C	A	D	B	C	C	B	B	B
Approach Vol, veh/h		37			430			624			1218	
Approach Delay, s/veh		27.5			45.1			21.0			13.4	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.7	50.0		33.2	5.6	64.2		33.2				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+I), s	11.8	13.8		26.7	2.1	14.6		2.9				
Green Ext Time (p_c), s	1.0	3.9		1.5	0.0	5.5		0.2				

Intersection Summary

HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

01/13/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	777	168	171	843	91	127	157	115	123	179	14
Future Volume (veh/h)	27	777	168	171	843	91	127	157	115	123	179	14
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	30	863	187	188	926	100	153	189	139	158	229	18
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.83	0.83	0.83	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	242	1073	233	221	1205	130	484	701	313	561	338	27
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2905	629	1795	3261	352	1795	3582	1598	1795	1725	136
Grp Volume(v), veh/h	30	528	522	188	509	517	153	189	139	158	0	247
Grp Sat Flow(s),veh/h/ln	1781	1777	1757	1795	1791	1822	1795	1791	1598	1795	0	1861
Q Serve(g_s), s	0.0	33.3	33.3	5.0	28.8	28.8	0.0	5.2	8.8	0.0	0.0	14.2
Cycle Q Clear(g_c), s	0.0	33.3	33.3	5.0	28.8	28.8	0.0	5.2	8.8	0.0	0.0	14.2
Prop In Lane	1.00		0.36	1.00		0.19	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	242	657	649	221	662	673	484	701	313	561	0	364
V/C Ratio(X)	0.12	0.80	0.80	0.85	0.77	0.77	0.32	0.27	0.44	0.28	0.00	0.68
Avail Cap(c_a), veh/h	399	657	649	379	662	673	484	701	313	561	0	364
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.5	46.4	46.4	50.3	31.9	31.9	35.6	39.3	40.7	29.5	0.0	42.9
Incr Delay (d2), s/veh	0.2	10.1	10.2	9.0	8.4	8.2	0.4	0.9	4.5	0.3	0.0	9.8
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(50%),veh/ln	0.8	17.7	17.5	5.8	13.6	13.8	3.6	2.4	3.9	3.4	0.0	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	56.5	56.6	59.2	40.3	40.1	36.0	40.2	45.3	29.8	0.0	52.7
LnGrp LOS	D	E	E	E	D	D	D	D	D	C	A	D
Approach Vol, veh/h	1080				1214				481		405	
Approach Delay, s/veh	56.2				43.2				40.3		43.7	
Approach LOS	E				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.8	48.0	27.2	27.0	12.8	48.0	27.2	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	42.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+1), s	35.3	35.3	2.0	10.8	2.0	30.8	2.0	16.2				
Green Ext Time (p_c), s	0.4	3.7	0.3	1.2	0.0	5.0	0.3	0.7				

Intersection Summary

HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	17	61	580	741	8
Future Vol, veh/h	6	17	61	580	741	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	18	66	630	805	9

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1257	407	814
Stage 1	810	-	-
Stage 2	447	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	163	593	809
Stage 1	398	-	-
Stage 2	611	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	150	593	809
Mov Cap-2 Maneuver	271	-	-
Stage 1	365	-	-
Stage 2	611	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	809	-	453	-	-
HCM Lane V/C Ratio	0.082	-	0.055	-	-
HCM Control Delay (s)	9.8	-	13.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.2	-	-

HCM 6th TWSC
13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

01/13/2023

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	45	19	616	688	70
Future Vol, veh/h	25	45	19	616	688	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	33	60	20	662	849	86

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1263	468	935	0	-	0
Stage 1	892	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	162	542	741	-	-	-
Stage 1	361	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	158	542	741	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	351	-	-	-	-	-
Stage 2	668	-	-	-	-	-

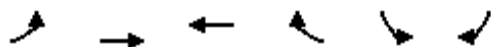
Approach	EB	NB	SB
HCM Control Delay, s	15.2	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	741	-	272	542	-	-
HCM Lane V/C Ratio	0.028	-	0.123	0.111	-	-
HCM Control Delay (s)	10	-	20.1	12.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.4	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

01/13/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Traffic Volume (veh/h)	61	974	1062	46	34	64			
Future Volume (Veh/h)	61	974	1062	46	34	64			
Sign Control		Free	Free		Stop				
Grade		0%	0%		0%				
Peak Hour Factor	0.94	0.94	0.92	0.92	0.72	0.72			
Hourly flow rate (vph)	65	1036	1154	50	47	89			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None		TWLTL						
Median storage veh)			2						
Upstream signal (ft)			319						
pX, platoon unblocked	0.81				0.81	0.81			
vC, conflicting volume	1204				1568	602			
vC1, stage 1 conf vol					1179				
vC2, stage 2 conf vol					389				
vCu, unblocked vol	787				1236	45			
tC, single (s)	4.1				6.8	6.9			
tC, 2 stage (s)					5.8				
tF (s)	2.2				3.5	3.3			
p0 queue free %	90				85	89			
cM capacity (veh/h)	672				310	826			
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2	
Volume Total	213	296	296	296	769	435	47	89	
Volume Left	65	0	0	0	0	0	47	0	
Volume Right	0	0	0	0	0	50	0	89	
cSH	672	1700	1700	1700	1700	1700	310	826	
Volume to Capacity	0.10	0.17	0.17	0.17	0.45	0.26	0.15	0.11	
Queue Length 95th (ft)	8	0	0	0	0	0	13	9	
Control Delay (s)	4.1	0.0	0.0	0.0	0.0	0.0	18.7	9.9	
Lane LOS	A							C	A
Approach Delay (s)	0.8				0.0				12.9
Approach LOS								B	
Intersection Summary									
Average Delay			1.1						
Intersection Capacity Utilization			59.2%		ICU Level of Service			B	
Analysis Period (min)			15						

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	229	276	222	159	220	297	293	300	519	471	174	291
Average Queue (ft)	96	141	119	5	148	242	240	211	243	199	58	194
95th Queue (ft)	185	216	197	53	250	320	306	361	468	370	162	296
Link Distance (ft)	210	210	210	210		220	220		504	504		209
Upstream Blk Time (%)	1	1	0		0	13	17		0			11
Queuing Penalty (veh)	3	2	0		0	66	82		0			48
Storage Bay Dist (ft)					316			275			150	
Storage Blk Time (%)					0	13		27	0		0	24
Queuing Penalty (veh)					1	24		60	0		0	16

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	SB
Directions Served	TR
Maximum Queue (ft)	292
Average Queue (ft)	200
95th Queue (ft)	305
Link Distance (ft)	209
Upstream Blk Time (%)	12
Queuing Penalty (veh)	51
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	30	76	231	174	213	197	155	112	153
Average Queue (ft)	7	7	19	96	6	89	89	79	56	41
95th Queue (ft)	26	27	49	181	58	174	178	125	106	101
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)						0	0			
Queuing Penalty (veh)						0	0			
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						3				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	312	312	200	354	277	122	129	141	125	212	204
Average Queue (ft)	46	220	236	113	181	141	73	37	69	41	84	92
95th Queue (ft)	145	323	332	199	286	244	119	109	122	87	152	149
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		7	8									
Queuing Penalty (veh)		33	39									
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		12		0	8		11	0	3	0		
Queuing Penalty (veh)		3		0	14		9	0	4	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	52	53
Average Queue (ft)	17	23
95th Queue (ft)	46	48
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	79	114	31	158	193
Average Queue (ft)	29	27	5	14	17
95th Queue (ft)	69	67	23	74	89
Link Distance (ft)		222		322	322
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)	6	0	0		
Queuing Penalty (veh)	4	0	0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	137	21	137	55
Average Queue (ft)	47	1	40	35
95th Queue (ft)	108	7	100	54
Link Distance (ft)	80	210		370
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			150	
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Intersection: 16: Dummy #1 & Centre Ave (PB)/Centre Ave

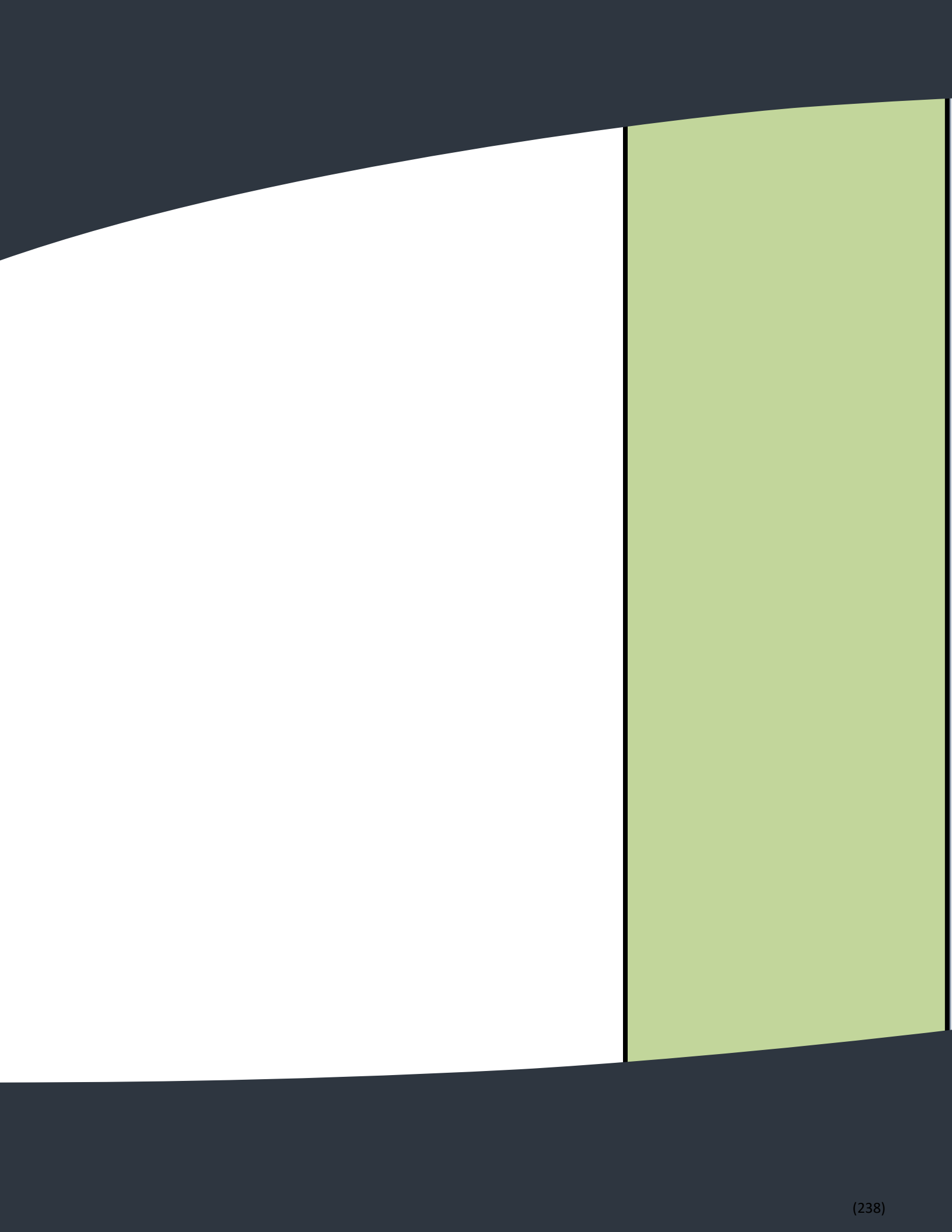
Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	TR	T	TR	R	R
Maximum Queue (ft)	77	104	137	143	97	31
Average Queue (ft)	6	10	24	18	38	14
95th Queue (ft)	35	49	91	85	76	38
Link Distance (ft)	220	220	240	240	140	132
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 21: S. Westnedge Ave (PB) & Dummy #2

Movement	WB
Directions Served	R
Maximum Queue (ft)	112
Average Queue (ft)	37
95th Queue (ft)	68
Link Distance (ft)	248
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 461



Eric Feldt

From: Muhammad Arif
Sent: Thursday, February 23, 2023 3:05 PM
To: Jonathon Hallberg
Cc: Kendra Gwin; Eric Feldt; Biqi Zhao
Subject: RE: The short list - TIS for River Caddis

Hi Johnathon:

These items have been taken care of by the consultant.

Sincerely,

From: Jonathon Hallberg <hallberj@portagemi.gov>
Sent: Thursday, February 23, 2023 3:04 PM
To: Muhammad Arif <arifm@portagemi.gov>
Cc: Kendra Gwin <gwink@portagemi.gov>; Eric Feldt <feldte@portagemi.gov>; Biqi Zhao <zhaob@portagemi.gov>
Subject: The short list - TIS for River Caddis

Muhammad –

These are the items I have on record that needed to be addressed for the TIS:

1. Fix speed limits on TIS: W. Centre = 40mph west of Shaver, 35mph east of Shaver. S Westnedge = 35mph between Shaver & Centre.
2. Shaver Road is a major arterial under the jurisdiction of the City of Portage. S. Westnedge also under City of Portage.
3. Fix PM Peak Traffic Hours to 4-5PM instead of 4:30-5:30PM for: Huntington Driveway, Westnedge/Centre Intersection, & Shaver/S Westnedge.
4. Verify unrealistic(?) peak hours indicated for Shaver and North Side Drive.

If I missed anything, please go ahead and add it to the list. From our call, I'm relieved to hear all came back today as satisfactory. Thanks so much for the summary remarks. We will keep an eye out for them.

With my thanks,

Jonathon Hallberg | Interim Director of Community Development

City of Portage, Community Development Department
7900 S. Westnedge Ave., Portage, MI 49002
O (269) 329-4474, M (618) 335-6654
www.portagemi.gov, hallberj@portagemi.gov

Eric Feldt

From: Muhammad Arif
Sent: Thursday, February 23, 2023 3:03 PM
To: Jonathon Hallberg
Cc: Biqi Zhao; Eric Feldt; Kendra Gwin; Sherman Potter; Jamie Harmon
Subject: River Caddis Development

Good Afternoon Jonathon:

I had a discussion with traffic engineering consultant this morning regarding revising the capacity analysis for the northern driveway. As I wanted to run two scenarios at this location to see the impact of increased eastbound left-turn traffic volume at this location. This afternoon I received the analysis, and it looks good. As consultant has satisfied our request, I have asked them to submit the final TIS report, including these two scenarios, as soon as possible.

Sincerely,

FEBRUARY 24, 2023

PORTAGE CREEK DEVELOPMENT PORTAGE, MICHIGAN



Prepared for:
Mr. Dan Wisinski
River Caddis Development
1038 Trowbridge Rd
East Lansing, MI 48823

Prepared by:
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Agency Review	Date	Comments

TRAFFIC IMPACT STUDY

PORTAGE CREEK DEVELOPMENT
PORTAGE, MI

Table of Contents

1	Project Background	1
2	Data Collection	3
2.1	Existing Roadway System.....	3
2.2	Traffic Counts.....	4
2.3	Background Traffic Growth.....	5
3	Site Analysis	6
3.1	Trip Generation	6
3.2	Internal Trip Capture	7
3.3	Trip Distribution	7
3.4	Pass-By Trips.....	10
3.5	Traffic Volumes	10
4	Traffic Analysis	21
4.1	Intersection Capacity Analysis	21
4.2	Turning Lane and Passing Flare Warrants.....	30
4.3	Sight Distance Analysis.....	31
5	Conclusions and Recommendations	33
6	Bibliography.....	35

Appendices

A	SITE PLAN INFORMATION
B	EXISTING TRAFFIC DATA
C	TRAFFIC ANALYSIS
D	SYNCHRO AND SIM TRAFFIC REPORTS

List of Tables

TABLE 1: INTERSECTION PEAK HOURS	4
TABLE 2: EXISTING 2022 TRAFFIC VOLUMES	5
TABLE 3: FUTURE 2024 TRAFFIC VOLUMES	6
TABLE 4: FUTURE TRIP GENERATION	7
TABLE 5: FUTURE BUILD-OUT AM PEAK HOUR TRIP DISTRIBUTION	9
TABLE 6: FUTURE BUILD-OUT PM PEAK HOUR TRIP DISTRIBUTION	10
TABLE 7: SIGNALIZED AND UNSIGNALIZED INTERSECTION LOS	21
TABLE 8: W. CENTRE AVE AND SHAVER RD – LOS AND DELAYS	23
TABLE 9: W. CENTRE AVE AND SHAVER RD – QUEUES	23
TABLE 10: SHAVER RD AND S. WESTNEDGE AVE – LOS/DELAYS	24
TABLE 11: SHAVER RD AND S. WESTNEDGE AVE – QUEUES	24
TABLE 12: W. CENTRE AVE AND S. WESTNEDGE AVE – LOS/DELAYS.....	25
TABLE 13: W. CENTRE AVE AND S. WESTNEDGE AVE – QUEUES.....	25
TABLE 14: SHAVER RD AND NORTH SITE DRIVEWAY – LOS/DELAYS	26
TABLE 15: SHAVER RD AND NORTH SITE DRIVEWAY – QUEUES	27
TABLE 16: SHAVER RD AND SOUTH SITE DRIVEWAY – LOS/DELAYS.....	28
TABLE 17: SHAVER RD AND SOUTH SITE DRIVEWAY – QUEUES.....	28
TABLE 18: W. CENTRE AVE AND SITE DRIVEWAY – LOS/DELAYS	29
TABLE 19: CENTRE AVE AND SITE DRIVEWAY – QUEUES.....	29

List of Exhibits

EXHIBIT 1: SITE LOCATION MAP	1
EXHIBIT 2: PROPOSED SITE MAP.....	2
EXHIBIT 3: STUDY INTERSECTIONS/DRIVEWAYS.....	3
EXHIBIT 4: TRIP DISTRIBUTION	9
EXHIBIT 5: 2022 EXISTING TRAFFIC VOLUMES DIAGRAM	12
EXHIBIT 6: 2024 NO-BUILD TRAFFIC VOLUMES DIAGRAM	13
EXHIBIT 7: TRIP DISTRIBUTION DIAGRAM	14
EXHIBIT 8: TRIP GENERATION DIAGRAM	15
EXHIBIT 9: TRIP GENERATION DIAGRAM: SCENARIO #1.....	16
EXHIBIT 10: TRIP GENERATION DIAGRAM: SCENARIO #2	17
EXHIBIT 11: 2024 FUTURE BUILD-OUT DIAGRAM	18
EXHIBIT 12: 2024 FUTURE BUILD-OUT DIAGRAM: SCENARIO #1	19
EXHIBIT 13: 2024 FUTURE BUILD-OUT DIAGRAM: SCENARIO #2	20
EXHIBIT 14: RIGHT-TURN LANE WARRANT ANALYSIS	30
EXHIBIT 15: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND SOUTH SITE DRIVEWAY	31
EXHIBIT 16: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND NORTH SITE DRIVEWAY.....	32
EXHIBIT 17: SIGHT DISTANCE TRIANGLE AT W. CENTRE AVE AND SITE DRIVEWAY	32

1 Project Background

The traffic impact study included herein was completed for River Caddis Development for their use in the planning and design approval process for the development including a 228-unit apartment complex and 2 work-live buildings. RSE prepared this analysis to examine the potential traffic impacts of the proposed multi-family housing development on the adjacent roadway network. The proposed development is located near the northwest quadrant of W. Centre Ave and Shaver Rd in Portage, MI. The proposed site will have one access driveway from W. Centre Ave and two access driveways from Shaver Rd. All three proposed access points are existing driveways. The existing site is vacant/wooded. The site location is shown on Exhibit 1.

EXHIBIT 1: SITE LOCATION MAP



Map Data © 2022 Google Maps

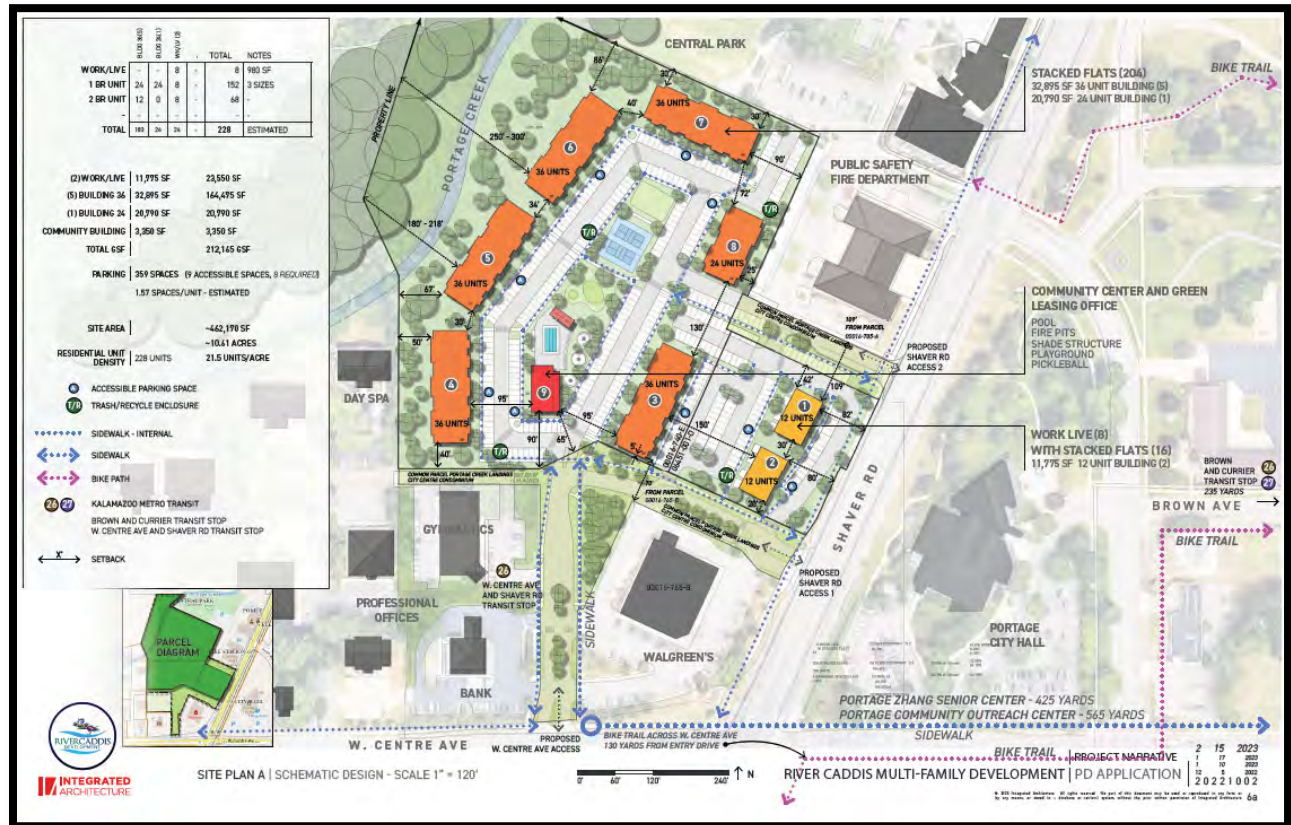
The proposed Portage Creek site plan was provided by River Caddis Development. The proposed site plan will develop 228 units of residential buildings with 2 work-live buildings on the existing wooded land. Per the ITE Trip Generation Manual (11th Ed.), the Multi-Family Housing (Low Rise) calculates an average of 2.72 residents per occupied dwelling unit. Planned completion of the development is in year 2024.

For analysis purposes, the build-out year for the Portage Creek development is projected for year 2024. For trip generation purposes, the following land use was used to represent the development:

- Multifamily Housing (Low Rise) – Dwelling Units

The proposed multi-family housing development with work-live buildings will have three access points (driveways). One driveway is located on W. Centre Ave, west of Walgreens. The second driveway is located on Shaver Rd, north of Walgreens. The third driveway is located on Shaver Rd, south of the Portage Department of Public Safety building. All three driveways are existing. The proposed site map including the access points is shown in Exhibit 2.

EXHIBIT 2: PROPOSED SITE MAP



The traffic analysis will focus on the build-out of the new multi-family housing and work-live development and its impacts on traffic operations at the existing/proposed driveways and on the adjacent roadway network. Traffic operations are evaluated for the existing/proposed driveways and existing intersection locations. Based on coordination with the City of Portage, the site access driveways and intersections listed below will be included in the analysis. These intersections and driveways were included both for traffic modeling purposes and due to the potential impacts of the proposed development. All required study roadways, intersections, and driveways for the proposed site development are shown on Exhibit 3.

Driveways/Intersections

- Shaver Rd at West Centre Ave
- Shaver Rd at Westnedge Ave
- Existing Walgreens Drive (South Site Drive) at Shaver Rd
- Existing North Site Drive at Shaver Rd
- Existing Site Drive at W Centre Ave
- Shaver Rd at S Westnedge Ave

EXHIBIT 3: STUDY INTERSECTIONS/DRIVEWAYS



2 Data Collection

2.1 Existing Roadway System

The proposed site is located at the northwest quadrant of Centre Ave and Shaver Rd in Portage, MI. There are three existing/proposed driveways for the proposed housing development. One driveway is located on W. Centre Ave and two are located on Shaver Rd.

There are three major signalized intersections located within the limits of the study. They include W. Centre Ave at Shaver Rd, Shaver Rd at S Westnedge Ave, and W. Centre Ave at S Westnedge Ave.

W. Centre Ave is an east-west, 4-lane paved roadway with a center left turn lane. It is under the jurisdiction of the City of Portage. It is classified as other principal arterial and has a posted speed limit of 40 mph between Oakland Dr and Shaver Rd, and a posted speed limit of 35 mph between Shaver Rd and Lover's Lane.

Shaver Rd is a north-south, 4-lane paved roadway with a center left turn lane. It is under the jurisdiction of the City of Portage. It is classified as a major arterial and has a posted speed limit of 35 mph.

S Westnedge Ave runs generally north-south and bends at the intersection with Shaver Rd. It is a 4-lane paved roadway. It is under the jurisdiction of the City of Portage. It is classified as a minor arterial and has a posted speed limit of 35 mph between W. Centre Ave and Shaver Rd.

2.2 Traffic Counts

Turning movement counts at the following study intersections were collected by RS Engineering (RSE) using Miovision on Tuesday December 6, 2022, and Thursday December 8, 2022.

- Shaver Rd and Westnedge Rd
- Shaver Rd and Walgreens Driveway (Shaver Rd South Site Dr)
- Shaver Rd and W. Centre Ave
- W. Centre Ave and S. Westnedge Ave
- W. Centre Ave and Site Driveway (Centre Ave Site Dr)

Signal timing information was provided by the City of Portage.

The peak hour traffic counts were conducted during a *typical*¹ work/school day. The client collected turning movement counts during the AM and PM peak hours within the following hours:

AM Peak: 7:00am - 9:00am

PM Peak: 4:00pm - 6:00pm

The Miovision raw traffic data collection summary sheets are provided **Appendix B**. The turning movement count data was reviewed, and it was determined that the AM and PM peak hours at each intersection occur during the following time periods:

TABLE 1: INTERSECTION PEAK HOURS

	Intersections	Actual AM Peak	Actual PM Peak
1	W. Centre Rd and Shaver Ave	7:15-8:15 AM	4:00-5:00PM
2	Shaver Rd and S. Westnedge Ave	7:15-8:15 AM	4:30-5:30 PM
3	W. Centre Rd and S. Westnedge Ave	7:00-8:00 AM	4:30-5:30 PM
4	Shaver Rd and Walgreens Driveway (Shaver Rd South Site Dr)	8:00-9:00 AM	4:00-5:00 PM
5	W. Centre Ave and Site Driveway (Centre Ave Site Dr)	7:15-8:15 AM	4:30-5:30 PM

Per the City of Portage comments received on January 31, 2023 and February 2, 2023, the PM peak hour was revised to 4:00 to 5:00 for all intersections so that the network peak hour would match. The AM peak volumes remained the same the same using the A peak hours as noted on Table 1 above. Per the City of Portage comments on January 31, 2023, the volumes for Shaver and North Site drive were balanced using the same AM Peak (7:15 to 8:15 AM) to make the volumes realistic. The North Site Drive volumes for AM and PM peak uses the same peak hour between the Shaver/Westnedge and Shaver/Centre Ave signals. The

peak hour traffic volumes for the AM and PM peaks used in the analysis for the existing conditions are shown in Table 2.

¹ A "typical" day for traffic data collection purposes is a non-holiday, mid-week (Tuesday, Wednesday, Thursday) and standard traffic and weather conditions.

TABLE 2: EXISTING 2022 TRAFFIC VOLUMES

Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count	
			AM Peak	PM Peak				AM Peak	PM Peak
W. Centre Ave at Shaver Rd	Eastbound	Left	86	190	Shaver Rd North Site Driveway	Eastbound	Left	0	0
		Thru	707	584			Right	2	5
		Right	131	218		Northbound	Left	8	22
	Westbound	Left	138	180			Thru	347	597
		Thru	636	768		Southbound	Thru	290	722
		Right	12	25			Right	0	0
	Northbound	Left	89	182	Shaver Rd South Site Driveway	Eastbound	Left	8	16
		Thru	234	392			Right	8	32
		Right	103	214		Northbound	Left	1	4
	Southbound	Left	17	59			Thru	347	601
		Thru	173	507		Southbound	Thru	274	674
		Right	69	130			Right	18	53
Shaver Rd at S. Westnedge	Eastbound	Left	1	6	W. Centre Ave Site Driveway	Eastbound	Left	13	53
		Thru	0	5			Thru	921	980
		Right	2	8		Westbound	Thru	754	1000
	Westbound	Left	5	13			Right	12	16
		Thru	3	5		Southbound	Left	1	29
		Right	240	332			Right	13	50
	Northbound	Left	3	3	2022 Traffic Volumes				
		Thru	294	579					
		Right	31	15					
	Southbound	Left	229	309					
		Thru	263	701					
		Right	6	1					
W. Centre Ave at S. Westnedge	Eastbound	Left	12	26					
		Thru	706	708					
		Right	127	136					
	Westbound	Left	111	158					
		Thru	519	771					
		Right	52	112					
	Northbound	Left	174	117					
		Thru	153	143					
		Right	169	120					
	Southbound	Left	107	115					
		Thru	116	159					
		Right	3	16					

2.3 Background Traffic Growth

The proposed new multi-family housing and work-live development is projected to be completed by 2024. Since traffic counts were collected in year 2022, a growth rate must be applied to the existing turning movement counts. An annual growth rate of 0.5% was used to calculate the 2024 traffic volumes. The 0.5% growth rate was applied to each of the intersection's turning movement counts. A summary of those results is shown in Table 3.

TABLE 3: FUTURE 2024 TRAFFIC VOLUMES

Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count	
			AM Peak	PM Peak				AM Peak	PM Peak
W. Centre Ave at Shaver Rd	Eastbound	Left	87	192	Shaver Rd North Site Driveway	Eastbound	Left	0	0
		Thru	715	590			Right	2	6
		Right	133	221		Northbound	Left	8	23
	Westbound	Left	140	182			Thru	352	603
		Thru	643	776		Southbound	Thru	293	730
		Right	13	26			Right	0	0
	Northbound	Left	90	184	Shaver Rd South Site Driveway	Eastbound	Left	9	17
		Thru	237	396			Right	9	33
		Right	105	217		Northbound	Left	2	5
	Southbound	Left	18	60			Thru	351	608
		Thru	175	513		Southbound	Thru	277	681
		Right	70	132			Right	19	54
Shaver Rd at S. Westnedge	Eastbound	Left	2	7	W. Centre Ave Site Driveway	Eastbound	Left	14	54
		Thru	0	6			Thru	931	990
		Right	3	9		Westbound	Thru	762	1011
	Westbound	Left	6	14			Right	13	17
		Thru	4	6		Southbound	Left	2	30
		Right	243	336			Right	14	51
	Northbound	Left	4	4	Year 2024 Future Traffic Volumes (0.5% Growth)				
		Thru	297	585					
		Right	32	16					
	Southbound	Left	232	313					
		Thru	266	709					
		Right	7	2					
W. Centre Ave at S. Westnedge	Eastbound	Left	13	27					
		Thru	714	716					
		Right	129	138					
	Westbound	Left	113	160					
		Thru	525	779					
		Right	53	114					
	Northbound	Left	176	119					
		Thru	155	145					
		Right	171	122					
	Southbound	Left	109	117					
		Thru	118	161					
		Right	4	17					

3 Site Analysis

3.1 Trip Generation

The *ITE Trip Generation Manual, 11th Edition* (Institute of Transportation Engineers, 2021) provides equations and rates to calculate the estimated traffic from over 170 different land uses. The proposed site plan is to develop 228 residential units with 8 work-live spaces. The following ITE Trip Generation Land Use was identified and used in the analysis.

- Land Use 220 – Multi-Family Housing (Low Rise)

According to the ITE Trip Generation Manual, low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Trips generated by the housing development are captured using Land Use 220, Multifamily Housing (Low-Rise). This land use was chosen due to similar size and occupancy of the development. The ITE land use and estimated trip generation for the Future Build-Out during the weekday AM and PM peak hours are summarized in Table 4 and Appendix C.

TABLE 4: FUTURE TRIP GENERATION

Portage Creek Development Trip Generation (Trip Generation Manual 11th Edition)											
LUC	Description	Number	Unit	AM Peak				PM Peak			
				Equation	In	Out	Total	Equation	In	Out	Total
220	Multifamily Housing (Low-Rise)	228	Dwelling Unit	$T = 0.31(X) + 22.85$	23	71	94	$T = 0.43(X) + 20.55$	75	44	119
				Total	23	71	94	Total	75	44	119

3.2 Internal Trip Capture

The ITE Trip Generation Manual does not account for a development with two or more complementary land uses or a mixed-use development. At a mixed-use development, there is potential for interaction among those land uses; this is referred to as *Internal Capture*. As a result, the total generation of external trips (trips entering and exiting the overall site) may be less than the simple sum of the trips generated by each individual land use. The methodology to correct this error is presented in the *NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*.

Based on the proposed development's land use and site layout, internal trip capture was not included during the AM or PM peak hours. Internal trips are not expected for this development and the land uses were not listed on the *NCHRP Report 684*.

The *NCHRP 684* report incorporates non-motorized trips. A non-motorized trip is defined as a person trip that is part of either a walk trip or bicycle trip. The greater the percentage of non-motorized trips the lower the number of vehicles trips. Non-motorized trips are more typical in urban core locations and areas with pedestrian/bike trails. The proposed housing development will not incorporate a percentage of non-motorized trips. This will ensure a more conservative representation of traffic generated by the development into the roadway network.

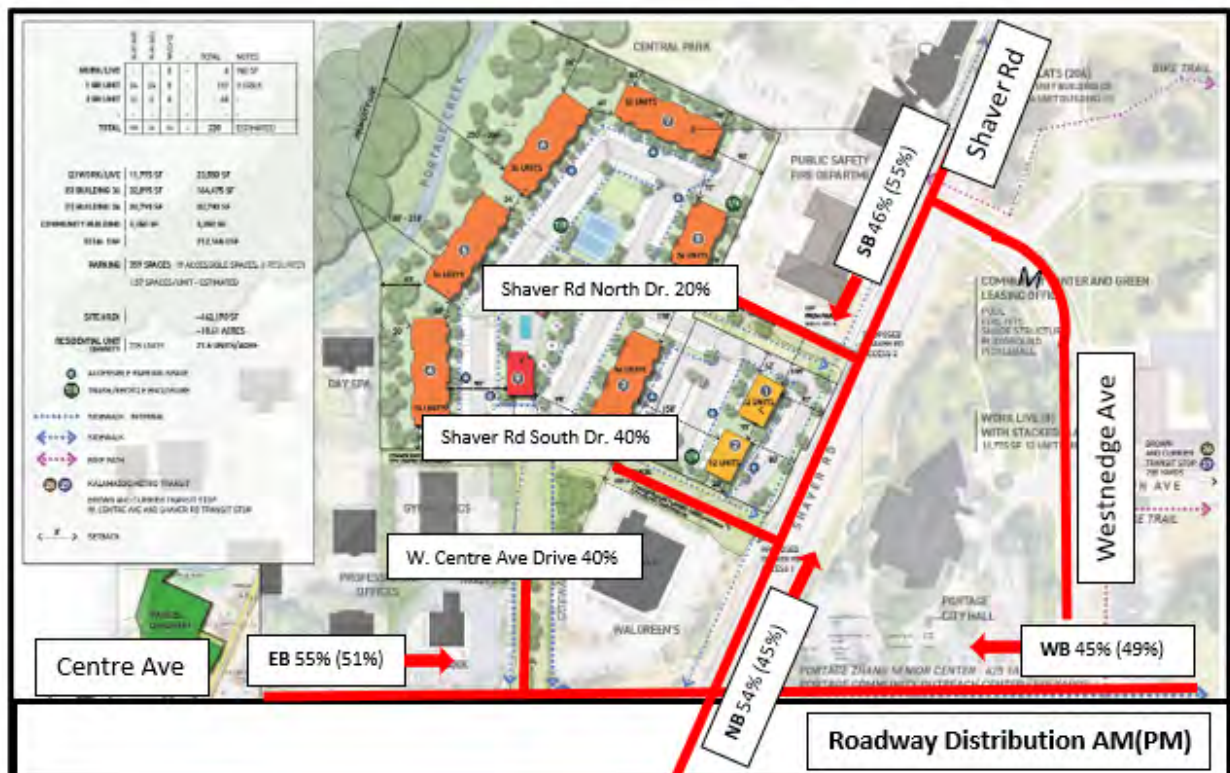
3.3 Trip Distribution

Trips generated by the proposed development must be distributed at the site access point so that the impacts on the existing roadway system and intersections can be evaluated. The total trips generated for the Future Build-Out were distributed at the site access point based on the following factors:

- Existing peak hour traffic distribution along W. Centre Ave
 - AM
 - EB approach: 55%
 - WB approach: 45%

- PM
 - EB approach: 51%
 - WB approach: 49%
- Existing peak hour traffic distribution along Shaver Rd
 - AM
 - NB approach: 54%
 - SB approach: 46%
 - PM
 - NB approach: 45%
 - SB approach: 55%
- The existing roadways and proposed site trip distributions are shown in Exhibit 4.
 - 40% of the new trips will use the Existing Site Driveway on W. Centre Ave
 - 40% of the new trips will use the Existing Walgreens Driveway on Shaver Rd
 - 20% of the new trips will use the Existing North Site Driveway on Shaver Rd
- Based on the location of the driveways relative to the trip origin/destination, existing roadways and traffic signals, the following were assumed for scenarios 1 and 2 based on the comments by the City of Portage:
 - Scenario 1
 - Exiting left turn traffic at Shaver Rd South Driveway will move to the North Driveway (EB Left turn on Shaver Rd).
 - Scenario 2
 - Exiting traffic headed north from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB left turn to Shaver Rd).
 - Exiting traffic headed south from the W Centre Ave Driveway will likely use the Shaver Rd South Driveway (EB right turn to Shaver Rd).
 - Exiting traffic headed east from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB left turn to Shaver Rd, southbound left turn at W Centre Ave and Shaver Rd).
- Peak hour/Time of day

EXHIBIT 4: TRIP DISTRIBUTION



Based on the factors above, the peak hour trip distribution percentages were developed. The trip distribution percentages and the subsequent results for the trips generated by the proposed site are shown in Tables 5 and 6.

TABLE 5: FUTURE BUILD-OUT AM PEAK HOUR TRIP DISTRIBUTION

ITE Trip Generation	AM Peak Hour Distribution											
Enter/Exit	Entering						Exiting					
Site Driveways	W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
	Direction	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Land Use	Multifamily Housing (Low-Rise)											
Total Enter/Exit	23						71					
Internal Distribution % *	40%		40%		20%		40%		40%		20%	
Access Point Distribution % **	45%	55%	46%	54%	46%	54%	45%	55%	46%	54%	46%	54%
Access Point Volumes	4	5	4	5	2	3	13	15	13	15	7	8
All Land Uses Total	4	5	4	5	2	3	13	15	13	15	7	8

TABLE 6: FUTURE BUILD-OUT PM PEAK HOUR TRIP DISTRIBUTION

ITE Trip Generation	PM Peak Hour Distribution											
Enter/Exit	Entering						Exiting					
Site Driveways	W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use	Multifamily Housing (Low-Rise)											
Total Enter/Exit	75						44					
Internal Distribution % *	40%		40%		20%		40%		40%		20%	
Access Point Distribution % **	49%	51%	55%	45%	55%	45%	48%	51%	55%	45%	55%	45%
Access Point Volumes	15	15	16	14	8	7	8	9	10	8	5	4
All Land Uses Total	15	15	16	14	8	7	8	9	10	8	5	4

*Internal Distribution: Assumed 40% of the traffic will be using the driveway on W Centre Ave, 40% using the Walgreens driveway on Shaver, and 20% using the north driveway on Shaver.

** The initial access point distribution is based on existing traffic on W. Centre Ave (EB and WB) and Shaver Rd (NB and SB).

*** Typical Diversions: Exiting traffic headed north from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB left turn to Shaver Rd). Exiting traffic headed south from the W Centre Ave Driveway will likely use the Shaver Rd North Driveway (EB right turn to Shaver Rd).

3.4 Pass-By Trips

Pass-by trips are trips generated by the development from the adjacent street traffic. The pass-by trips do not decrease the total trips generated by the development; however, the total *new* trips generated by the development are decreased. A percentage of the trips generated by the site are taken from the existing traffic on the adjacent street. The *ITE Trip Generation Handbook, 3rd Edition (2018)* provides guidance for calculating the pass-by trips for applicable developments. Typically, retail establishments, banks, and fast-food restaurants are specifically located on or adjacent to busy streets to attract motorists already on the roadway. It is expected that the proposed site would generate a portion of its trips from pass-by traffic.

Based on the proposed development's land uses, pass-by trips were not considered during the AM or PM peak hours because pass-by trips are generally not considered for residential developments. In addition, the proposed land uses are not listed in ITE Trip Generation Handbook for consideration of pass-by trips.

3.5 Traffic Volumes

The trips generated by the proposed site for the AM and PM peaks are added to the 2024 No-Build traffic Volumes. The 2022 Existing, 2024 No-Build, Trip Distribution, Trip Generation (original, scenario #1, scenario #2), and 2024 Build-Out (original, scenario #1, scenario #2) traffic volumes for the AM and PM peaks are shown in Exhibit 5 to Exhibit 13.

Existing traffic counts were collected by RS Engineering (RSE) using Miovision in December 2022. RSE applied a growth rate for all intersections to project traffic volumes to year 2024. Synchro dummy nodes were used in the traffic modeling to balance traffic volumes along W. Centre Ave and S. Westnedge Ave to account for uncounted driveways and intersections.

The diagram shown below in Exhibit 5 represents the turning movements during peak hour volumes for 2022 existing volumes for each of the study intersections. Exhibit 6 below shows the 2024 No-Build traffic volumes. This diagram represents the 2022 existing conditions plus a 0.5% growth rate for each year. Exhibit 7 below shows the trip distribution diagram. This diagram represents the percentage of split of the new trips generated by the development. The percentage splits are based on existing traffic volumes. Exhibit 8 - 10 below shows the trip generation diagram with the two additional scenarios per the City of Portage comments. This diagram

represents the number of new trips entering and exiting the development with the origin and destination based on the trip distribution from Exhibit 7. Exhibit 11 - 13 below shows the 2024 future Build-Out diagram with the two additional scenarios. This diagram represents the volume for 2024 with the No-Build and trip generation volumes combined.

EXHIBIT 5: 2022 EXISTING TRAFFIC VOLUMES DIAGRAM

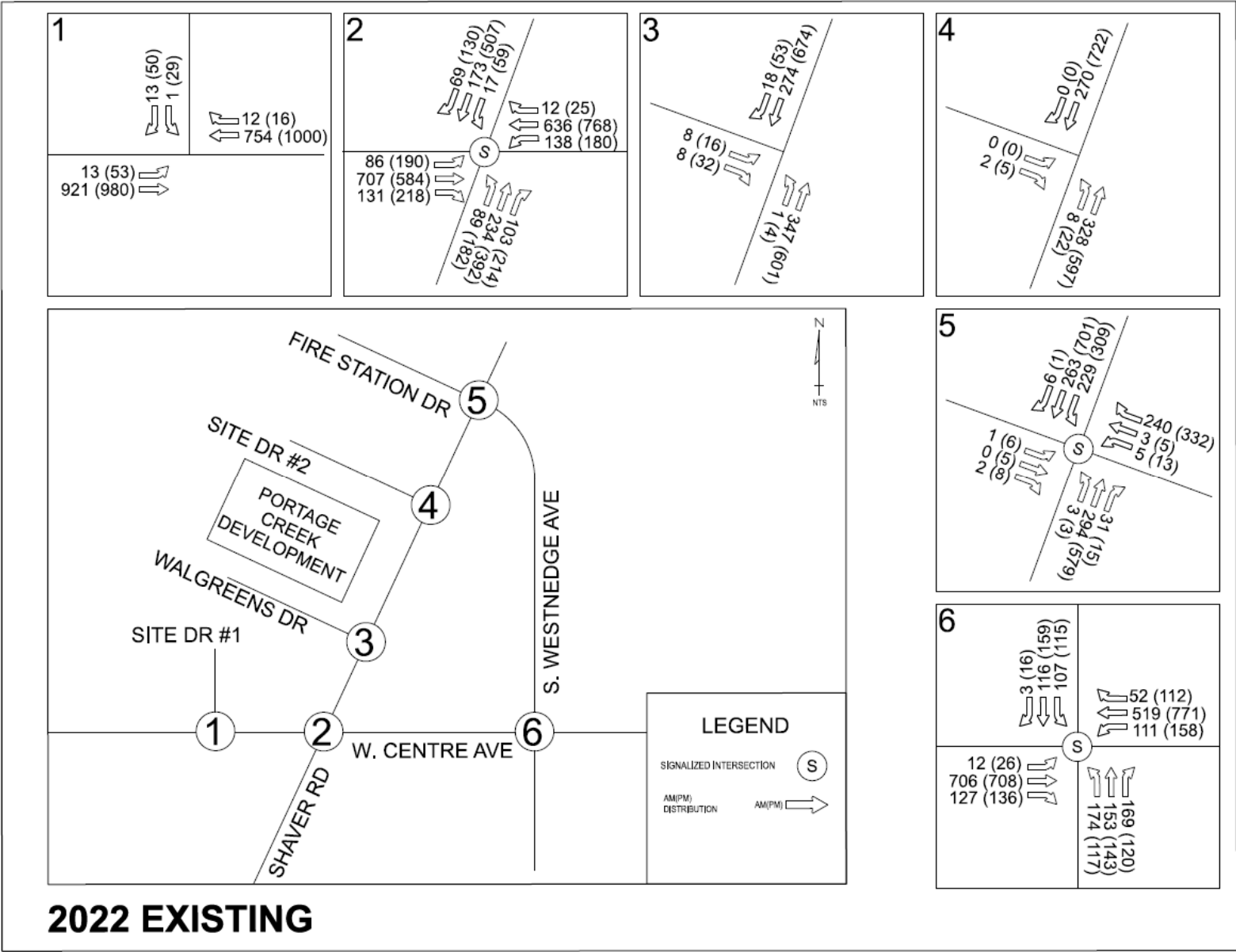


EXHIBIT 6: 2024 NO-BUILD TRAFFIC VOLUMES DIAGRAM

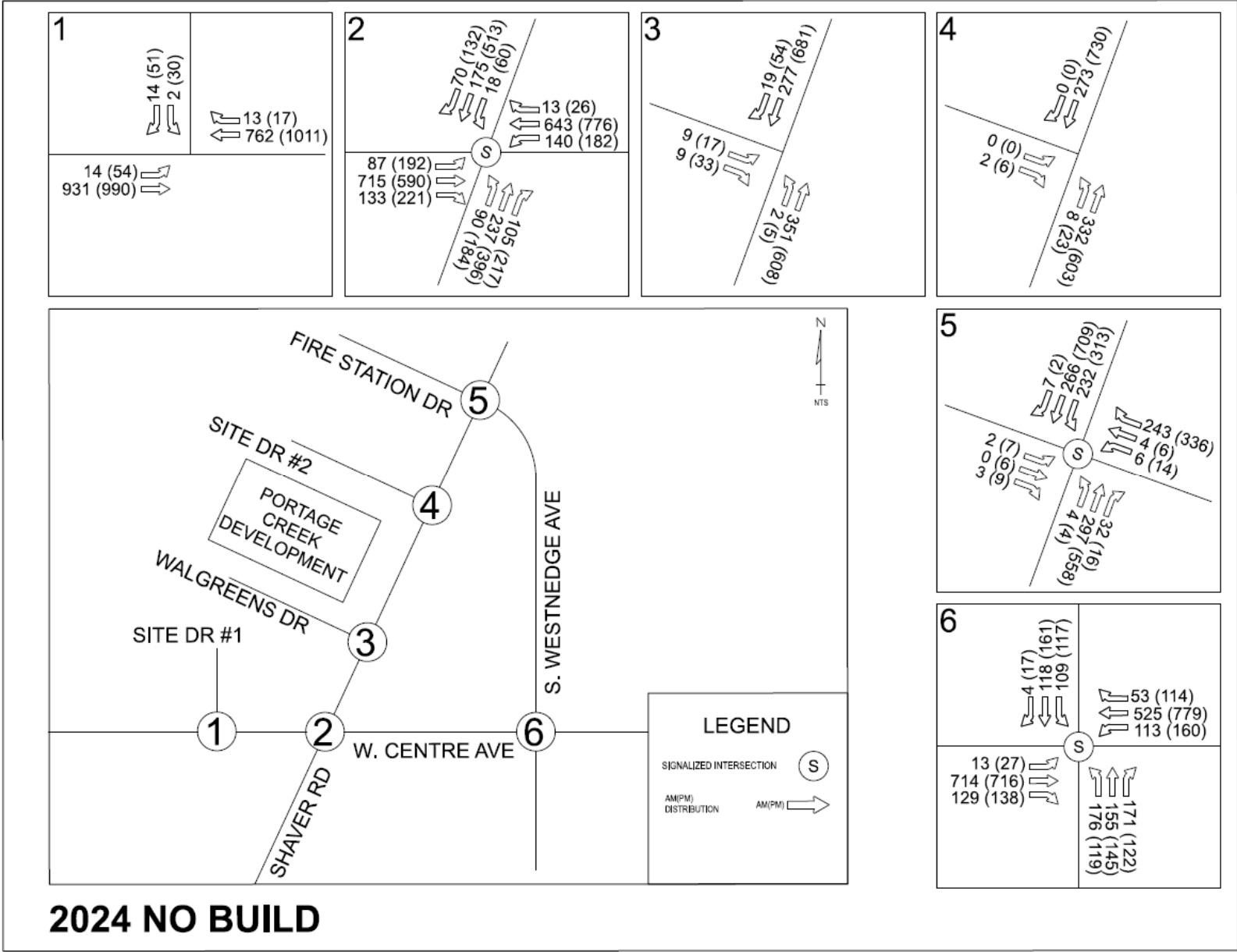


EXHIBIT 7: TRIP DISTRIBUTION DIAGRAM

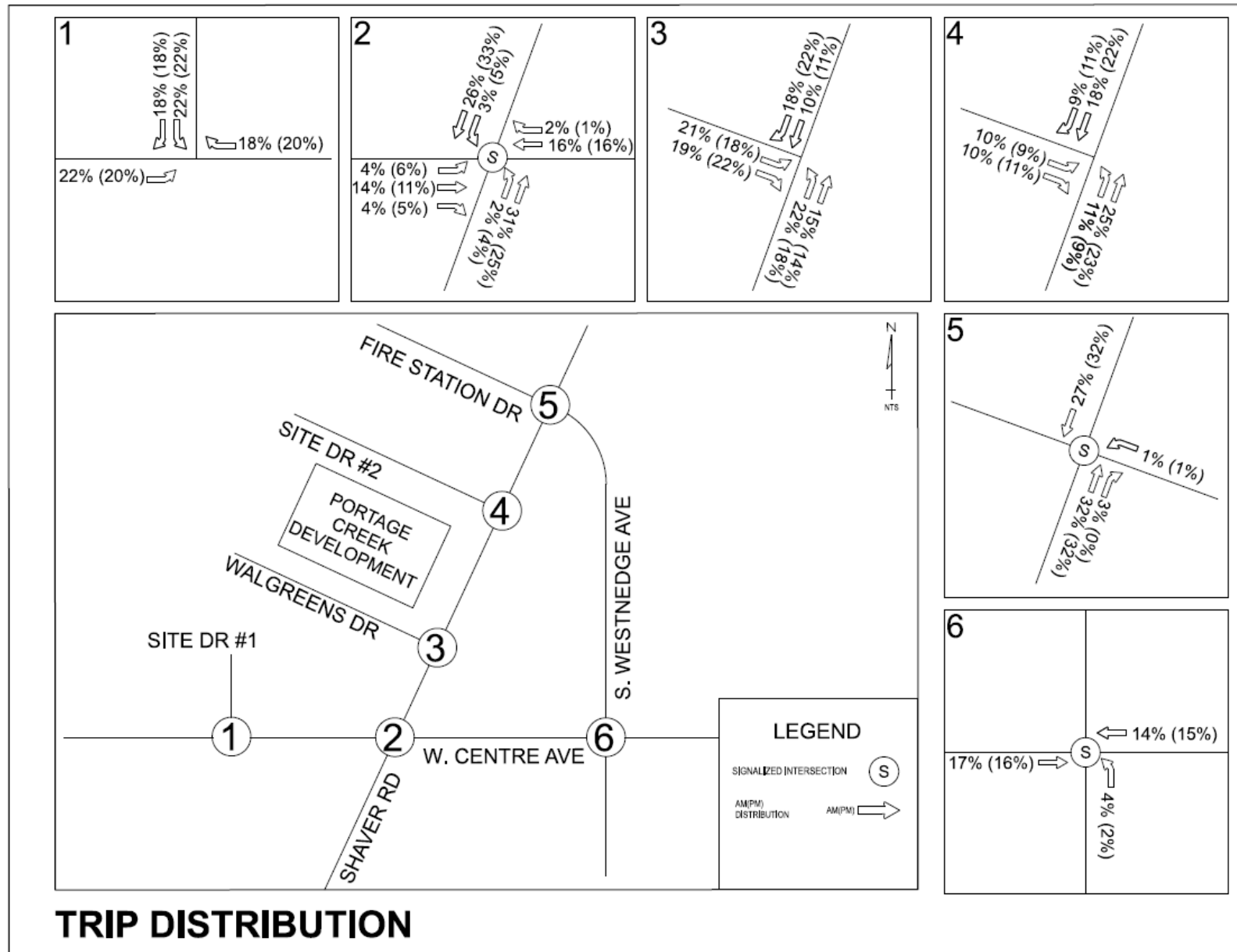


EXHIBIT 8: TRIP GENERATION DIAGRAM

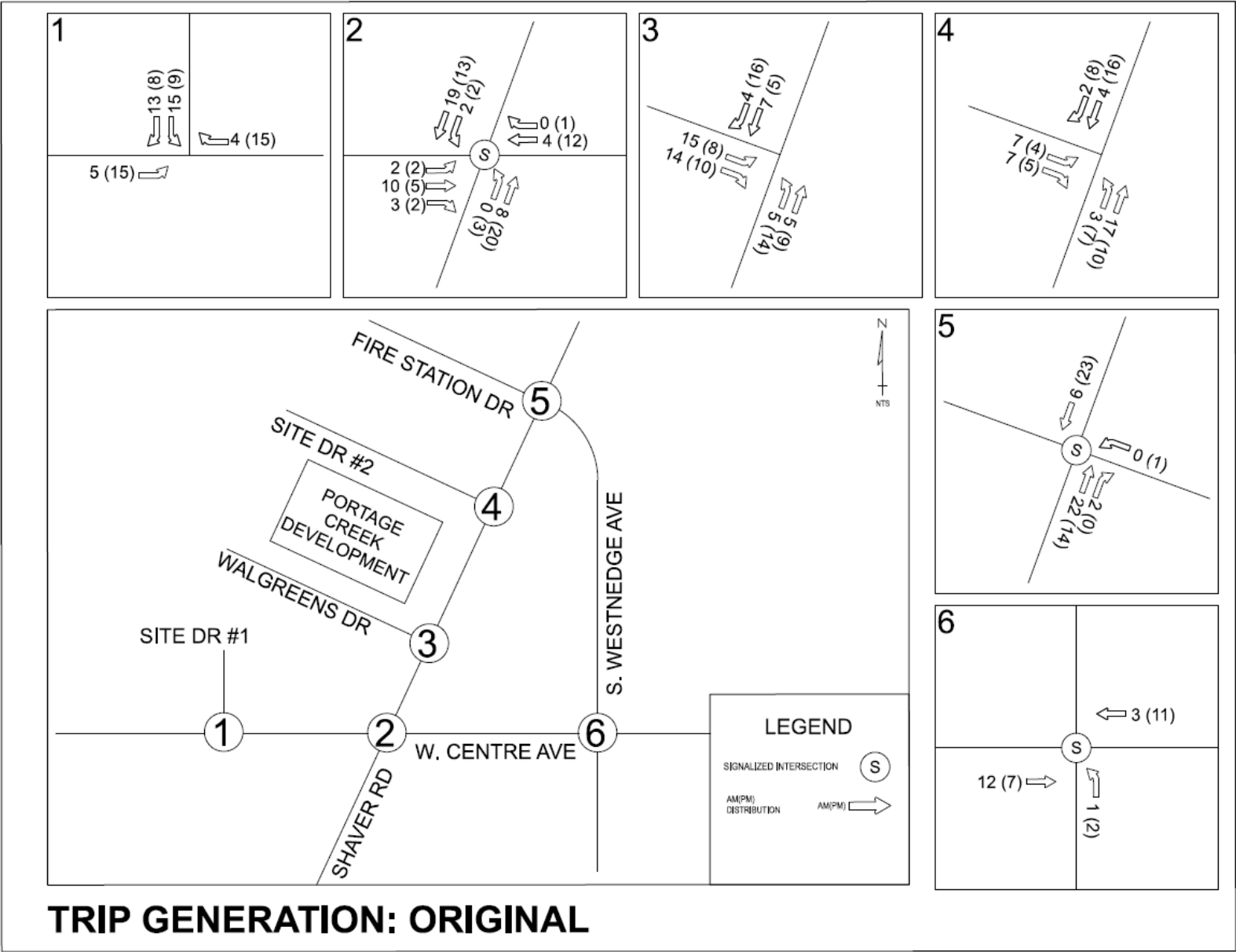


EXHIBIT 9: TRIP GENERATION DIAGRAM: SCENARIO #1

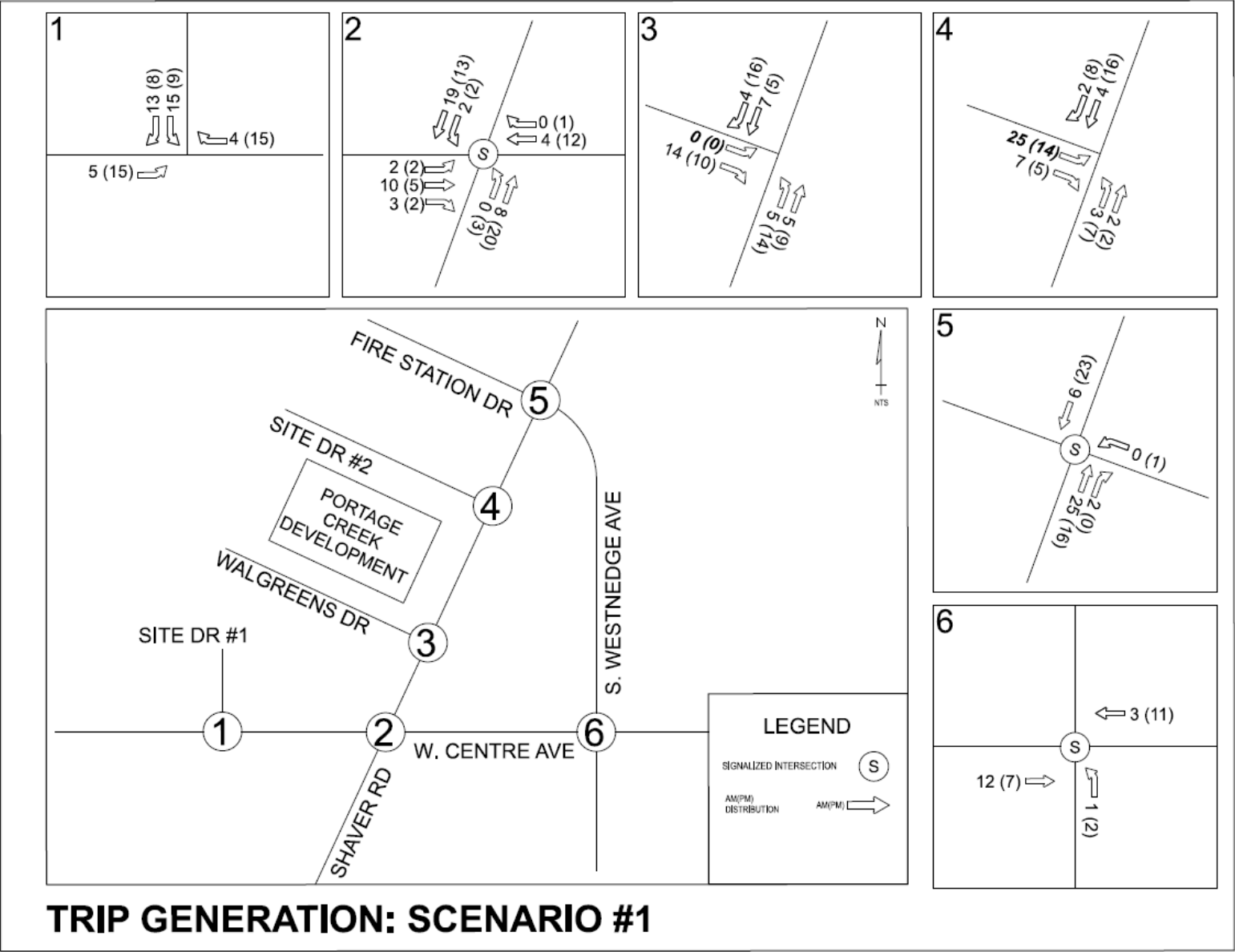


EXHIBIT 10: TRIP GENERATION DIAGRAM: SCENARIO #2

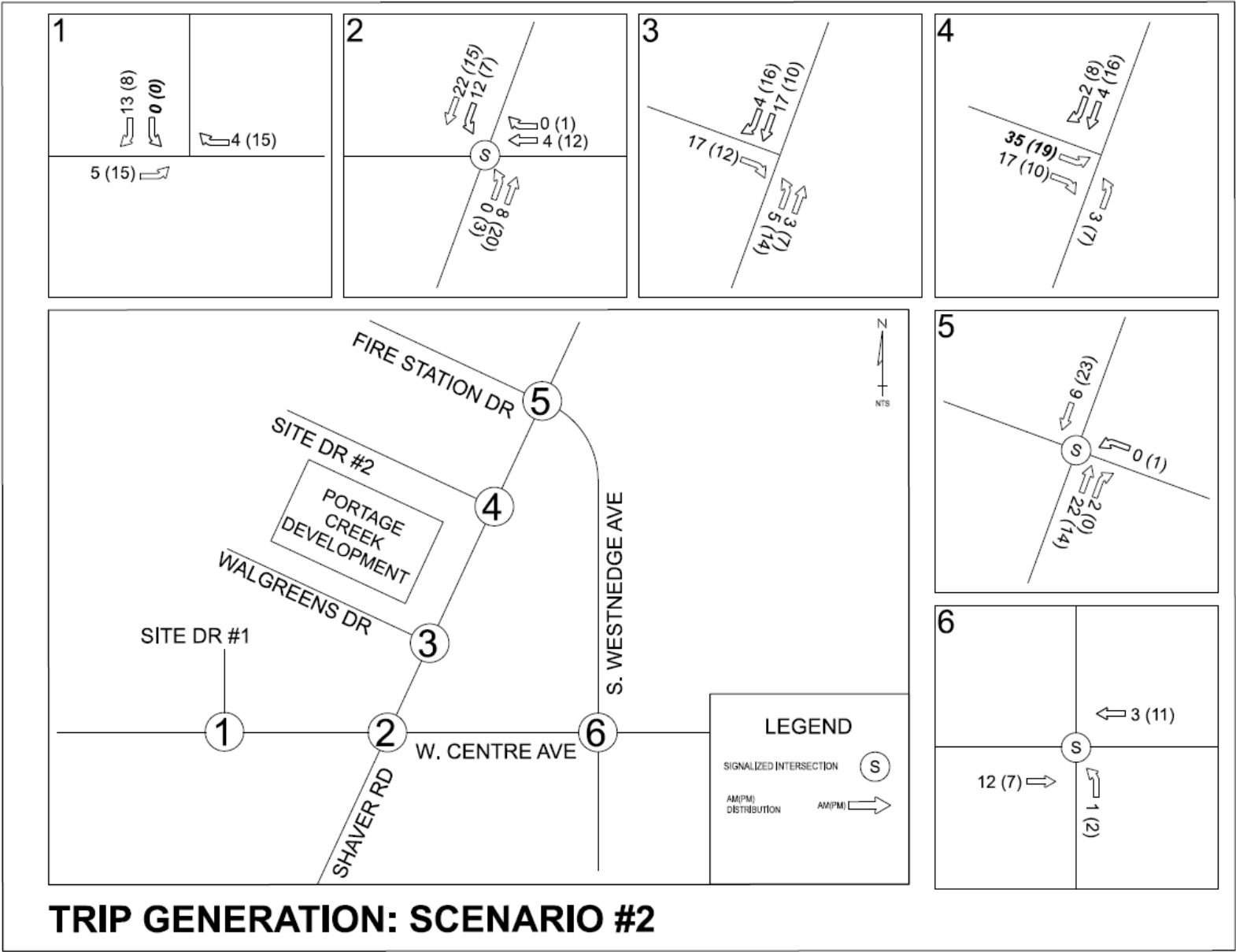


EXHIBIT 11: 2024 FUTURE BUILD-OUT DIAGRAM

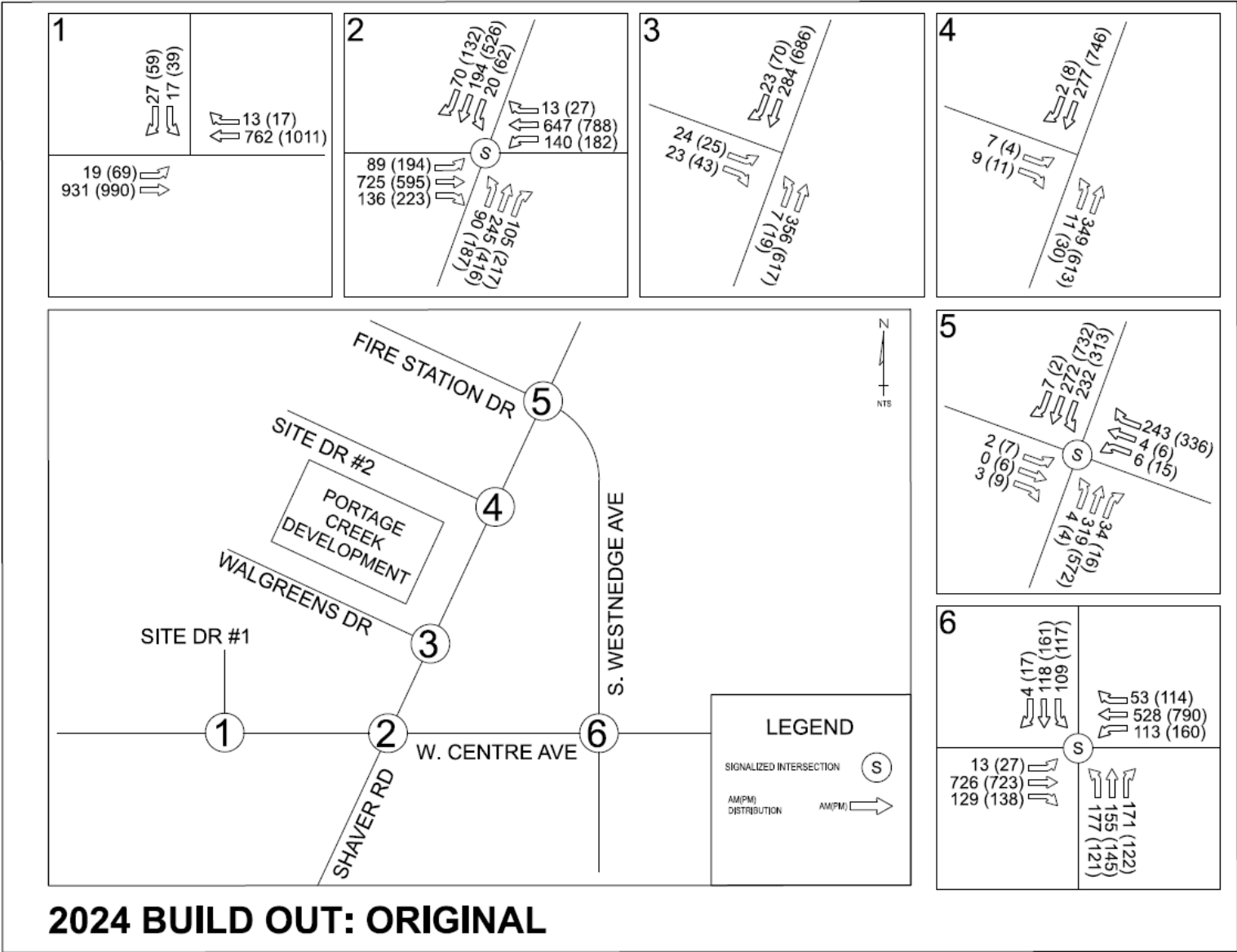


EXHIBIT 12: 2024 FUTURE BUILD-OUT DIAGRAM: SCENARIO #1

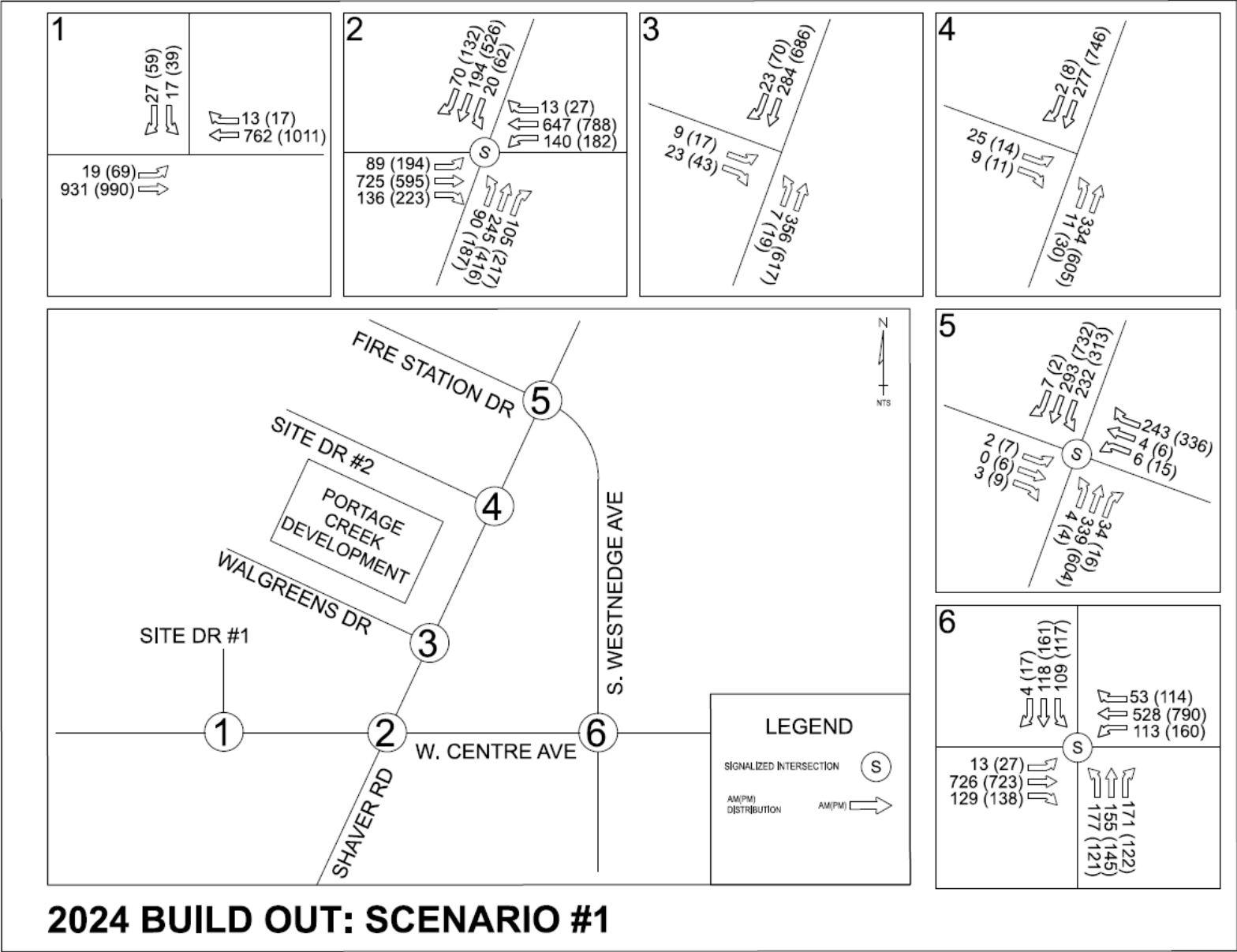
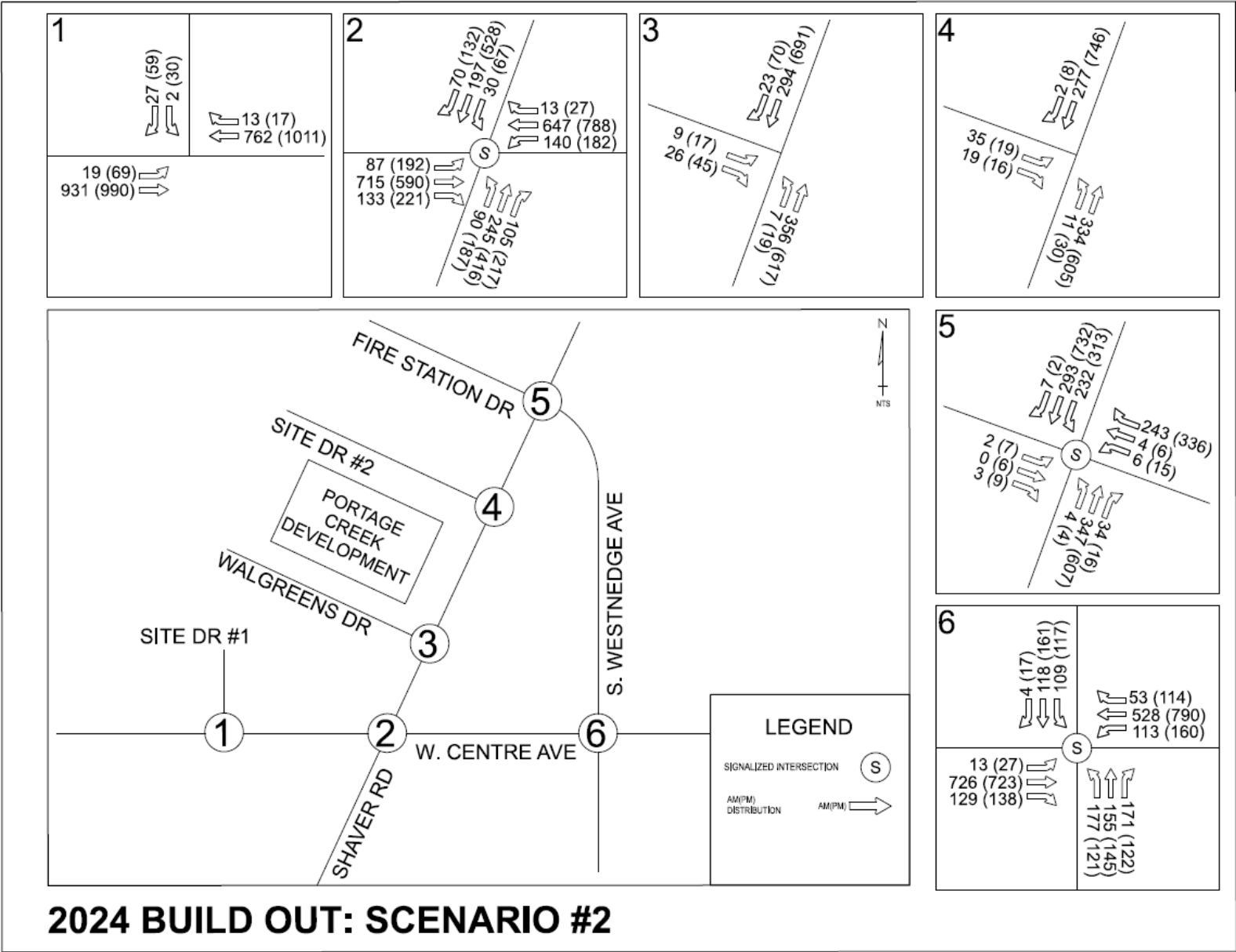


EXHIBIT 13: 2024 FUTURE BUILD-OUT DIAGRAM: SCENARIO #2



4 Traffic Analysis

4.1 Intersection Capacity Analysis

4.1.1 Methodology

The intersection analyses were performed using the Synchro 11/SimTraffic 11 software packages. The 6th Edition Highway Capacity Manual (HCM) and HCM Unsignalized Intersection Capacity Analysis methodologies were used for evaluating intersection operations at the intersections. The methodology uses several variables input into the model to evaluate traffic operations including:

- Volume
- Peak Hour Factor (PHF)
- Speed
- Intersection Controls
- Signal Timing

The level-of service (LOS) criterion for both signalized and unsignalized intersections are summarized in Table 7. Signalized intersections have longer control delay criteria than unsignalized intersections, since drivers can see the traffic control and know that within a set period they will have permitted or protected movement through the intersection. Unsignalized intersections have more uncertainty than signalized intersections, and drivers are less willing to wait for extended periods for gaps in traffic; therefore, the control delay criteria are less than a signalized intersection.

TABLE 7: SIGNALIZED AND UNSIGNALIZED INTERSECTION LOS

Control Delay (sec/vehicle)		Level-of-Service (LOS)	Description
Signalized	Stop Control		
0-10	0-10	A	Minimal control delay
>10-20	>10-15	B	Slightly restricted, not significant delays
>20-35	>15-25	C	Stable operations
>35-55	>25-35	D	Less stable, increased delays
>55-80	>35-50	E	Unstable operations, significant delays
>80	>50	F	Congested, high delay, extensive queues

The SimTraffic 11 software was used to model and simulate the traffic operations at the study intersections. The traffic modeling parameters used in the models are based on the MDOT Electronic Traffic Control Device Guidelines (2017). The existing condition traffic models were developed to reflect actual field conditions prior to analysis of the proposed conditions. Dummy intersections were used in existing and future conditions to balance the volumes between the study intersections based on MDOT Electronic Traffic Control Guidelines. The SimTraffic models were used to evaluate queues at the study intersections. SimTraffic queue lengths show the 95th percentile maximum queue lengths. The 95th percentile queue is

the maximum back of queue with 95th percentile traffic volumes. Adequate level of service is generally defined as LOS D or better.

4.1.2 Analysis Summary

A capacity analysis was completed to determine the impacts of the site generated traffic on the access, mobility, safety, and traffic operations at the proposed site and adjacent roadways. The capacity analysis was conducted for the study intersections for the following conditions during the AM and PM peaks:

- Existing 2022
- Future 2024 No-Build
- Future 2024 Build-Out
- Future 2024 Build-Out Scenario #1 and #2
- Future 2024 Build-Out Mitigation

The Peak Hour Factor (PHF) provided by the turning movement counts was applied when modeling the 2022 Existing, 2024 No-Build, 2024 Build-Out, 2024 Build-Out Scenarios #1 and #2 and 2024 Build-Out mitigation conditions. The HCM Synchro reports were generated to determine the LOS, delay, and 95th percentile queue length for each condition during each peak hour. There were no geometric improvements to the existing roadways. All site driveways are existing. The existing signal timings were used in the analysis for the 2022 Existing, 2024 No-Build, and 2024 Build-Out conditions. The timing for the signal at W. Centre Ave and Shaver Rd was modified for the 2024 Build-Out Mitigation condition. The existing timing permits were provided by the City of Portage. Timing permits can be found in Appendix B.

Tables 8 through 19 provide the results of the capacity analysis for the proposed development by condition, peak hour, and intersection turning movement. The Synchro HCM and SimTraffic reports used in this analysis are provided in Appendix D. Note that free flow thru traffic in unsignalized intersections typically does not have delay values and free flow right turn movements have minimal delay values. The LOS for these free flow movements can be assumed as LOS A with very minimal or no delays.

The existing drive at W. Centre Ave is approximately 21-22 feet wide, and existing traffic counts show that vehicles turn both left and right when exiting the site. The existing and proposed laneage for that driveway is separate right and left turn lanes for exiting traffic. The existing and proposed laneage for the South Site Driveway at Shaver Rd is separate right and left turn lanes for exiting traffic. The existing laneage for the North Site Driveway at Shaver Rd is a shared right and left turn lane for exiting traffic. The proposed development will provide separate right and left turn lanes for exiting traffic at the North Site Driveway.

TABLE 8: W. CENTRE AVE AND SHAVER RD – LOS AND DELAYS

W. CENTRE AVE AND SHAVER RD - LOS and Delays (Sec)											
Condition		Eastbound			Westbound		Northbound		Southbound		TOTAL
		Left	Thru	Right	Left	Thru-Right	Left	Thru-Right	Left	Thru-Right	
AM Peak	2022 Existing	B 12.9	B 17.7		B 13.9	C 31.0	D 36.3	D 44.4	D 36.8	D 47.1	C 28.6
	2024 No Build	B 13.1	B 17.9		B 14.2	C 31.3	D 36.2	D 44.5	D 36.6	D 47.0	C 28.8
	2024 Build Out	B 14.2	B 19.4		B 15.5	C 32.8	D 35.0	D 44.8	D 34.8	D 44.4	C 29.7
PM Peak	2022 Existing	C 22.5	C 23.4		B 18.4	D 41.1	F 130.4	E 61.4	C 34.8	F 84.7	D 54.2
	2024 No Build	C 22.9	C 23.5		B 18.5	D 41.3	F 139.4	E 63.0	C 34.9	F 87.6	E 55.7
	2024 Build Out	C 23.5	C 23.5		B 18.5	D 41.6	F 148.6	E 69.1	D 35.6	F 92.8	E 58.8
	2024 Mitigation	C 27.8	C 24.9		C 20.3	D 43.1	F 98.2	E 52.6	C 33.3	E 72.4	D 49.2

TABLE 9: W. CENTRE AVE AND SHAVER RD – QUEUES

W. CENTRE AVE AND SHAVER RD - Queue (ft)										
Condition		Eastbound			Westbound		Northbound		Southbound	
		Left	Thru	Right	Left	Thru-Right	Left	Thru-Right	Left	Thru-Right
AM Peak	2022 Existing	67	233		115	212	78	154	30	109
	2024 No Build	44	240		109	208	90	145	26	115
	2024 Build Out	79	231		119	242	93	173	33	120
PM Peak	2022 Existing	146	155		228	294	226	259	195	322
	2024 No Build	181	196		233	308	331	543	162	296
	2024 Build Out	174	193		239	312	243	266	142	274
	2024 Mitigation	174	211		225	329	222	240	133	329

W. Centre Ave and Shaver Rd (Tables 8 and 9)

- The intersection of W. Centre Ave and Shaver Rd operates at an acceptable LOS D or better during the AM peak hours for all conditions. During the PM peak hour, the intersection operates at an acceptable LOS D or better for all conditions except the northbound left (LOS F), northbound thru-right (LOS E), and the southbound thru-right (LOS F) movements.
- The existing LOS for northbound left turns for the PM peak hour is LOS F, and remains LOS F after the Build-Out, with an increase in delay of approximately 18.2 seconds.
- The existing LOS for the northbound thru-right movements for the PM peak hour is LOS E, and remains LOS E after the Build-Out, with an increase in delay of approximately 7.7 seconds.

- The existing LOS for the southbound thru-right movement is LOS F and remains LOS F after the Build-Out, with an increase in delay of approximately 5.5 seconds. The SB approach maximum queue extends beyond the site south driveway and the existing left turn storage lane.
- The eastbound right turn movement is channelized and controlled by a yield sign.
- Proposed mitigations to the signal timing and operation were evaluated to improve the northbound movements and the southbound thru-right movement. The mitigation model included adjustments to the signal timing splits (+1 sec for northbound/southbound left turn phase and +2 seconds for southbound/northbound phase; -1 sec for eastbound/westbound left turn phase and -2 sec for eastbound/westbound thru phase). The mitigated LOS and queue lengths are similar to existing conditions.

TABLE 10: SHAVER RD AND S. WESTNEDGE AVE – LOS/DELAYS

SHAVER RD AND S. WESTNEDGE AVE - LOS and Delays (Sec)										
Condition		Eastbound		Westbound		Northbound		Southbound		TOTAL
		Left-Thru	Thru-Right	Left-Thru	Right	Left	Thru-Right	Left	Thru-Right	
AM Peak	2022 Existing	C 26.8	C 26.5	C 26.6	D 40.4	B 11.3	B 13.5	A 8.6	A 8.7	B 17.9
	2024 No Build	C 26.9	C 26.5	C 26.6	D 40.4	B 11.5	B 13.7	A 8.8	A 8.9	B 18.1
	2024 Build Out	C 26.9	C 26.5	C 26.6	D 40.4	B 11.5	B 13.9	A 8.9	A 9.0	B 18.0
PM Peak	2022 Existing	C 26.7	C 26.7	C 26.7	D 44.0	B 14.6	B 19.4	B 12.6	B 12.7	C 20.5
	2024 No Build	C 26.7	C 26.7	C 26.8	D 44.6	B 14.9	B 19.9	B 13.0	B 13.0	C 20.9
	2024 Build Out	C 27.4	C 27.4	C 27.5	D 46.2	B 16.2	C 21.2	B 14.3	B 16.8	C 22.1

TABLE 11: SHAVER RD AND S. WESTNEDGE AVE – QUEUES

SHAVER RD AND S. WESTNEDGE AVE- Queue (ft)									
Condition		Eastbound		Westbound		Northbound		Southbound	
		Left-Thru	Thru-Right	Left-Thru	Right	Left	Thru-Right	Left	Thru-Right
AM Peak	2022 Existing	0	21	24	119	0	118	106	59
	2024 No Build	37	27	19	115	0	133	86	46
	2024 Build Out	22	23	38	117	0	126	81	53
PM Peak	2022 Existing	18	32	43	151	10	173	123	114
	2024 No Build	34	37	43	169	22	203	146	116
	2024 Build Out	26	34	38	134	22	166	193	124

Shaver Rd and S. Westnedge Ave (Tables 10 and 11)

- Shaver Rd and S. Westnedge operates at an acceptable level for all peak hours and conditions. The westbound right turn movement operates with LOS D for all AM and PM conditions, while the rest of the intersection is at LOS C or better for all AM and PM conditions.
- Mitigation is not necessary for this intersection.

TABLE 12: W. CENTRE AVE AND S. WESTNEDGE AVE – LOS/DELAYS

W. CENTRE AVE S. WESTNEDGE AVE - LOS and Delays (Sec)											
Condition		Eastbound		Westbound		Northbound			Southbound		TOTAL
		Left	Thru-Right	Left	Thru-Right	Left	Thru	Right	Left	Thru-Right	
AM Peak	2022 Existing	C 27.8	D 46.6	D 41.7	C 28.6	C 31.4	C 34.8	D 52.0	C 27.8	D 39.0	D 38.7
	2024 No Build	C 28.0	D 47.1	D 42.0	C 28.7	C 31.6	C 34.8	D 52.7	C 28.0	D 39.4	D 39.0
	2024 Build Out	C 28.0	D 48.3	D 42.7	C 28.8	C 31.6	C 34.8	D 52.7	C 28.0	D 39.4	D 39.5
PM Peak	2022 Existing	D 39.4	D 49.5	D 50.0	D 36.9	D 33.8	D 39.8	D 45.4	C 28.3	D 48.9	D 42.6
	2024 No Build	D 39.9	D 49.9	D 50.5	D 37.2	C 34.0	D 39.9	D 45.5	C 28.5	D 49.3	D 42.9
	2024 Build Out	D 40.3	D 50.3	D 50.9	D 37.6	C 34.1	D 39.9	D 45.4	C 28.5	D 49.3	D 43.2

TABLE 13: W. CENTRE AVE AND S. WESTNEDGE AVE – QUEUES

W. CENTRE AVE S. WESTNEDGE AVE - Queue (ft)										
Condition		Eastbound		Westbound		Northbound			Southbound	
		Left	Thru-Right	Left	Thru-Right	Left	Thru	Right	Left	Thru-Right
AM Peak	2022 Existing	71	275	110	160	132	135	109	145	157
	2024 No Build	97	283	110	204	139	123	109	103	107
	2024 Build Out	45	319	104	147	128	144	111	114	133
PM Peak	2022 Existing	138	304	139	201	119	126	69	130	165
	2024 No Build	106	296	214	282	122	158	121	132	169
	2024 Build Out	116	284	161	299	109	100	94	127	201

W. Centre Ave and S. Westnedge Ave (Tables 12 and 13)

- W. Centre Ave and S. Westnedge Ave operates at an acceptable LOS D or better during the AM and PM peak hours for all conditions.
- Mitigation is not necessary for this intersection.

TABLE 14: SHAVER RD AND NORTH SITE DRIVEWAY – LOS/DELAYS

SHAVER RD AND NORTH SITE DRIVEWAY - LOS and Delays (Sec)						
Condition		Eastbound		Northbound		Southbound
		Left	Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	A 9.2		A 7.9	-	-
	2024 No Build	A 9.2		A 7.9	-	-
	2024 Build Out	B 11.7	A 9.3	A 8.0	-	-
	2024 Build Scenario 1	B 11.9	A 9.3	A 8.0	-	-
	2024 Build Scenario 2	B 12.0	A 9.3	A 8.0	-	-
PM Peak	2022 Existing	B 11		A 9.5	-	-
	2024 No Build	B 11		A 9.5	-	-
	2024 Build Out	C 17.7	B 11.3	A 9.7	-	-
	2024 Build Scenario 1	C 18.2	B 11.2	A 9.7	-	-
	2024 Build Scenario 2	C 18.5	B 11.3	A 9.7	-	-

TABLE 15: SHAVER RD AND NORTH SITE DRIVEWAY – QUEUES

SHAVER RD AND NORTH SITE DRIVEWAY - Queue (ft)						
Condition		Eastbound		Northbound		Southbound
		Left	Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	9		14	-	-
	2024 No Build	14		10	-	-
	2024 Build Out	25	34	14	-	-
	2024 Build Scenario 1	45	38	17	-	-
	2024 Build Scenario 2	52	41	15	-	-
PM Peak	2022 Existing	26		38	-	-
	2024 No Build	14		28	-	-
	2024 Build Out	10	32	39	-	-
	2024 Build Scenario 1	33	30	26	-	-
	2024 Build Scenario 2	48	44	43	-	-

Shaver Rd and North Site Driveway (Tables 14 and 15)

- The intersection of Shaver Rd and the North Site Driveway operates well for all peak hours and conditions (LOS C or better for all approaches).
- The proposed driveway operates at LOS C or better for both the AM and PM peak hours with minimal queue lengths (approximately 3 vehicles).
- The northbound left turn traffic entering the north driveway has minimal queues (approximately 3 vehicles), which will not exceed the available left turn lane storage.

TABLE 16: SHAVER RD AND SOUTH SITE DRIVEWAY – LOS/DELAYS

SHAVER RD AND SOUTH SITE DRIVEWAY - LOS and Delays (Sec)						
Condition		Eastbound		Northbound		Southbound
		Left	Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	B 11.4	A 9.3	A 8.0	-	-
	2024 No Build	B 11.5	A 9.3	A 8.0	-	-
	2024 Build Out	B 12.1	A 9.5	A 8.1	-	-
PM Peak	2022 Existing	C 18.3	B 12	A 9.7	-	-
	2024 No Build	C 18.7	B 12.1	A 9.8	-	-
	2024 Build Out	C 20.2	B 12.5	B 10.0	-	-

TABLE 17: SHAVER RD AND SOUTH SITE DRIVEWAY – QUEUES

SHAVER RD AND SOUTH SITE DRIVEWAY - Queue (ft)						
Condition		Eastbound		Northbound		Southbound
		Left	Right	Left	Thru	Thru-Right
AM Peak	2022 Existing	28	31	10	-	-
	2024 No Build	14	27	10	-	-
	2024 Build Out	45	45	8	-	-
PM Peak	2022 Existing	37	58	10	-	58
	2024 No Build	51	49	15	-	94
	2024 Build Out	48	56	27	-	71

Shaver Rd and South Site Driveway (Tables 16 and 17)

- The intersection of Shaver Rd and the South Site Driveway operates at an acceptable LOS C or better for all peak hours and conditions.
- The proposed driveway operates at LOS C or better for both the AM and PM peak hours.
- The existing eastbound storage lengths are sufficient for the queue lengths based on modelling.
- The southbound thru-right movement has a queue length of 71 feet with the 2024 Build-Out conditions. This is mainly due to spillback from southbound approach queues at the Shaver Rd and Centre Rd intersection.
- The northbound left turn traffic entering the south driveway has minimal queues (approximately 2 vehicles), which has adequate left turn lane storage length.

TABLE 18: W. CENTRE AVE AND SITE DRIVEWAY – LOS/DELAYS

W. CENTRE AVE AND SITE DRIVEWAY - LOS and Delays (Sec)						
Condition		Eastbound		Westbound	Southbound	
		Left	Thru	Thru-Right	Left	Right
AM Peak	2022 Existing	A 1.0	-	-	B 14.3	A 9.2
	2024 No Build	A 1.0	-	-	B 14.6	A 9.2
	2024 Build Out	A 1.4	-	-	C 15.1	A 9.4
PM Peak	2022 Existing	A 3.2	-	-	C 17.8	A 9.8
	2024 No Build	A 3.7	-	-	C 18.0	A 9.8
	2024 Build Out	A 4.6	-	-	C 18.8	A 9.8

TABLE 19: CENTRE AVE AND SITE DRIVEWAY – QUEUES

W. CENTRE AVE AND SITE DRIVEWAY - Queue (ft)						
Condition		Eastbound		Westbound	Southbound	
		Left	Thru	Thru-Right	Left	Right
AM Peak	2022 Existing	31	-	-	-	43
	2024 No Build	36	7	-	10	46
	2024 Build Out	44	-	-	40	47
PM Peak	2022 Existing	94	-	-	68	56
	2024 No Build	74	-	11	60	49
	2024 Build Out	91	-	-	128	53

W. Centre Ave and Site Driveway (Tables 18 and 19)

- The intersection of W. Centre Ave and the Site Driveway operates at an acceptable LOS C or better for all peak hours and conditions.
- The proposed driveway operates at LOS C or better for both the AM and PM peak hours with minimal queue lengths (approximately 3 vehicles).
- The eastbound left turn traffic entering the W. Centre Ave driveway has queues up to approximately 91 feet maximum, which will not exceed the available left turn storage.

4.2 Turning Lane and Passing Flare Warrants

After reviewing the site generated trips, existing traffic, and background growth for the 2024 Build-Out, RSE completed an analysis to determine if right turn lanes or tapers or passing flares are warranted at the following locations:

- Shaver Rd and North Site Driveway
- Shaver Rd and South Site Driveway
- W. Centre Ave and Site Driveway

The City of Portage Contract Conditions and Specifications were used to evaluate the need for a right turn lane. All guidelines were reviewed at each location during the PM peak hour.

The City of Portage Contract Conditions and Specifications considers speed limit, number of lanes, average daily traffic on the main street, and right turns per hour to evaluate the need for a right turn lane. The speed limit on Shaver Rd is 35 mph. Since the specification only requires right turn lanes when the speed limit is more than 35 mph, the two driveways on Shaver Rd do not meet the warrants for a right turn lane. The City of Portage requirements for a right turn lane are shown in Exhibit 14.

EXHIBIT 14: RIGHT-TURN LANE WARRANT ANALYSIS

Right turn lanes should be provided when the speed limit is more than 35 mph and the average daily traffic of the main street is more than 10,000 vehicles per day and the number of right turning vehicles meets the criteria listed in Table 9.			
Posted Speed > 45 mph		Posted Speed < 45 mph	
Number of Lanes	Right Turn Vehicles per hour	Number of Lanes	Right Turn Vehicles per hour
2	30	2	80
4	40	4	110

A left turn warrant analysis was not necessary for Shaver Rd and the South Site Driveway since there is an existing center left turn lane on Shaver Rd.

The speed limit on W. Centre Ave is 40 mph. Per MDOT's Transportation Data Management System website, the average daily traffic in the vicinity of the site is more than 10,000 vehicles per day. The maximum number of right turning vehicles per hour is 32 vehicles during the PM peak hour. Based on this data and Exhibit 14 above, the driveway on W. Centre Rd does not meet the warrants for a right turn lane.

A left turn warrant analysis was not necessary for Shaver Rd and the South Site Driveway since there is an existing center left turn lane on Shaver Rd.

4.3 Sight Distance Analysis

RSE reviewed the site access points to determine if the required intersection sight distance will be adequate for the proposed driveways along Shaver Rd and W. Centre Ave. The sight distance was established based on the roadway speed and Tables 4 and 5 of the City of Portage Contract Conditions and Specifications Document. The speed for Shaver Rd is 35 mph, and the speed for W. Centre Ave is 40 mph west of Shaver Rd.

Based on the aerial, the intersection sight distance at all sight access points appears to have no concerns with horizontal and vertical curves. The proposed sight triangles (red areas) need to remain clear of objects or any sight obstruction. The sight distance triangles and the proposed clear sight distance areas for the proposed driveways are shown on Exhibits 15, 16, and 17.

At 35 mph:
SSD = 250 feet, ISD = 360 feet

At 40 mph:
SSD = 305 feet, ISD = 410 feet

EXHIBIT 15: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND SOUTH SITE DRIVEWAY

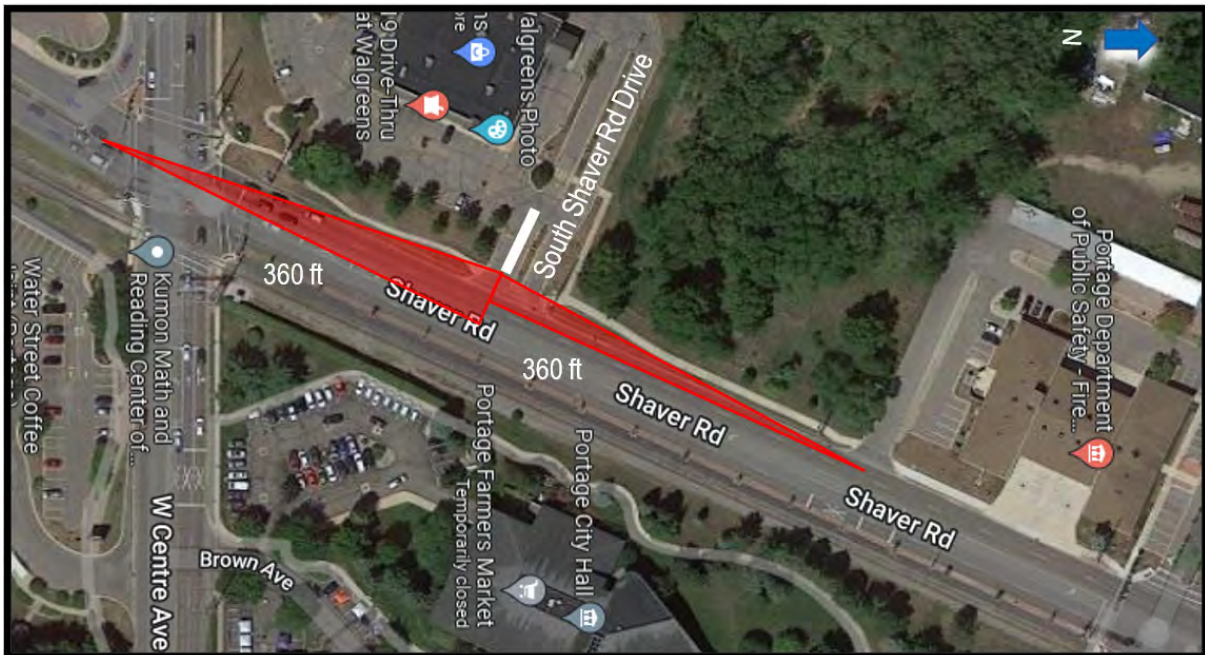


EXHIBIT 16: SIGHT DISTANCE TRIANGLE AT SHAVER RD AND NORTH SITE DRIVEWAY

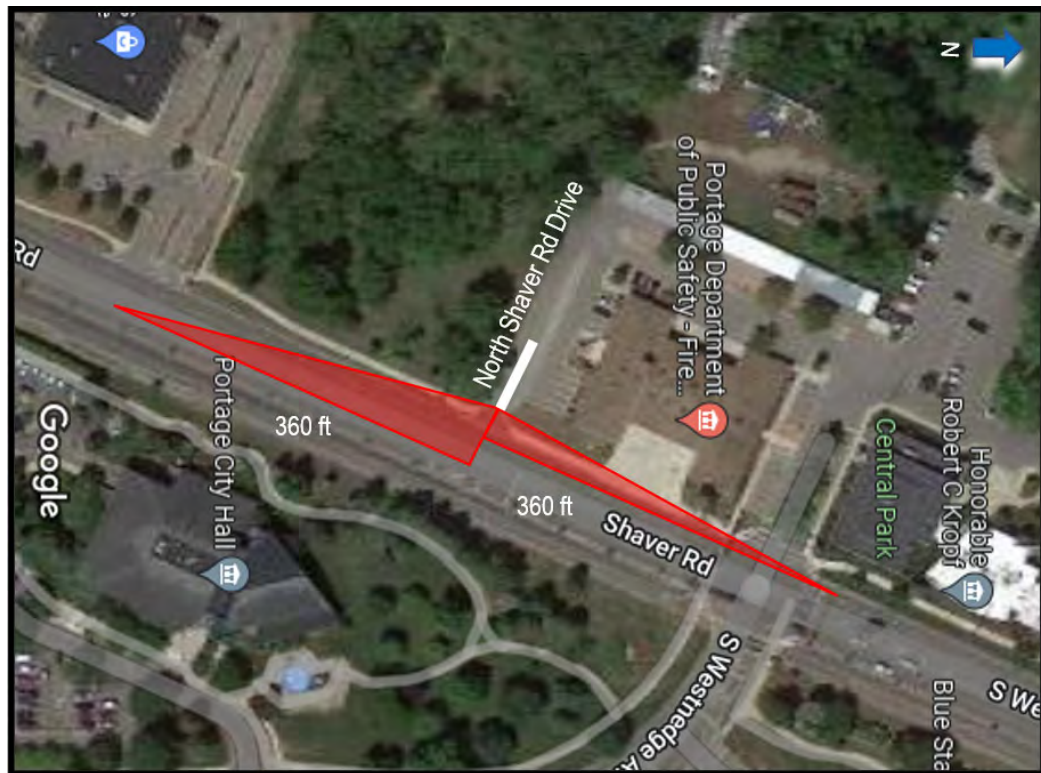
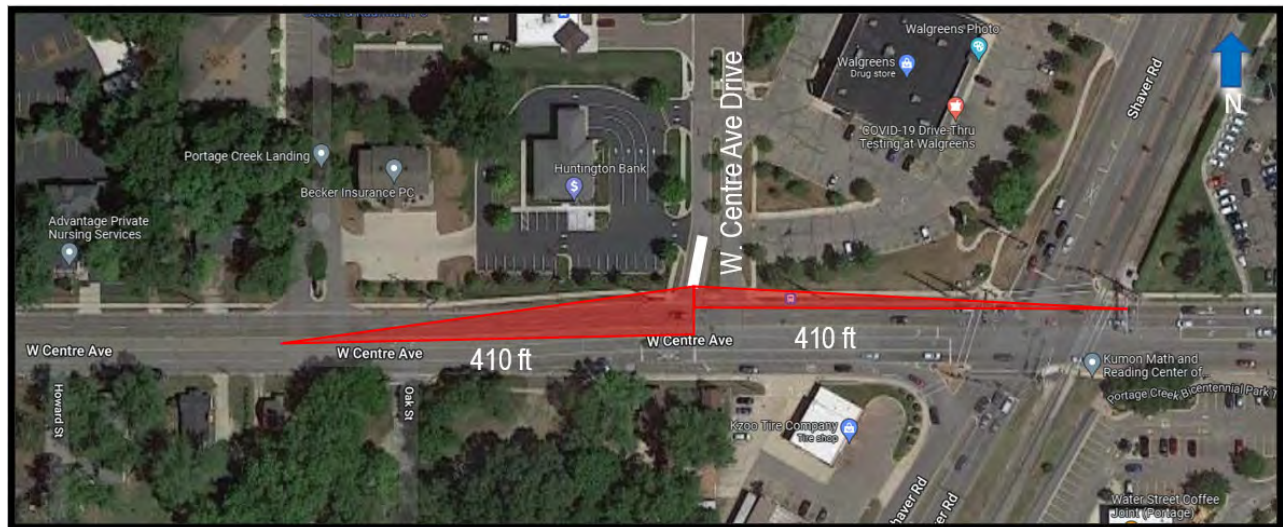


EXHIBIT 17: SIGHT DISTANCE TRIANGLE AT W. CENTRE AVE AND SITE DRIVEWAY



5 Conclusions and Recommendations

Based on the traffic data, the site plans, and the results of the traffic analysis presented herein, RSE has determined that adjacent roadways are expected to accommodate the proposed location of the Portage Creek multi-family housing and work-live development and its projected trip generations with some minor traffic operation and site access improvements. The analysis results and recommendations for the development are summarized below.

- a) All intersections/driveways operate at an acceptable LOS D or better during all peak periods for all conditions, with exception of the following:
 - The northbound left turn at W. Centre Ave and Shaver Rd during the PM peak hour.
 - The northbound thru-right movements at W. Centre Ave and Shaver Rd during the PM peak hour.
 - The southbound thru-right movement at W. Centre Ave and Shaver Rd during the PM peak hour.
- b) Generally, there are minor increases in delays and queues from the 2022 Existing to the 2024 Build-Out conditions during each peak hour for most movements at the study intersections, while generally maintaining the existing LOS.
- c) The W. Centre Ave and Shaver Rd intersection operates with LOS E for the northbound thru-right movement and LOS F for the northbound left and southbound thru-right movements in the existing condition. The delay increases for these movements during the No-Build and Build-Out conditions.
 - A mitigated model was used to evaluate potential improvement for the PM peak hour including the Build-Out. Adjusting the timings and splits (+1 sec for northbound/southbound left turn phase and +2 seconds for southbound/northbound phase; -1 sec for eastbound/westbound left turn phase and -2 sec for eastbound/westbound thru phase) improves the Build-Out LOS and delay similar to existing conditions.
- d) Right turn lanes warrants
 - None of the driveways met the City of Portage requirements for a right turn lane.
- e) Left turn lanes/taper warrants
 - Left turn warrant analysis was not necessary for any of the driveways due to the presence of center left turn lanes on both Shaver Rd and W. Centre Ave.
- f) Separate right and left turn exit lanes are recommended for the driveway on W. Center Ave. This is per the existing driveway/intersection operations, as demonstrated by the existing counts. Separate right and left turn exit lanes are recommended for the South Shaver Drive, which matches the existing condition. Full access should be maintained at the North Shaver Drive and it is recommended that right turn lane with a 100 ft (minimum) storage length should be added.
- g) As noted in the sight distance analysis section, it is recommended that the intersection quadrants within the sight triangle areas always remain clear of objects or any sight obstructions to provide adequate sight distance for the driveways.

- h) All existing intersection signal timings will be adequate of the 2024 Build-Out condition, except for the proposed timing adjustment at W. Centre Ave and Shaver Rd during the PM peak hour as noted below.
- W. Centre Ave/Shaver Rd
 - Adjust signal timing for the northbound/southbound left turn phase from 14 seconds to 15 seconds.
 - Adjust signal timing for the northbound/southbound phase from 31 to 33 seconds.
 - Reduce signal timing for the eastbound/westbound left turn phase from 15 seconds to 14 seconds.
 - Reduce signal timing for the eastbound/westbound phase from 55 to 53 seconds.
- i) Per the City of Portage comments, the LOS and queues for two additional build-out scenarios were analyzed for North Site Driveway on Shaver Rd. The LOS were all at a LOS C and better and the queue were at a minimal (less than 50 ft).

The geometrics for the driveways and right turn tapers must follow the requirements of the City of Portage standards for commercial driveway openings for roadways with curbs and speeds of 35 mph (Shaver Ave) or 40 mph (Centre Ave) speed limit. All recommended improvements along W. Centre Ave and Shaver Rd should be considered as part of the Portage Creek multi-family housing development design and construction efforts, and should be designed according to the geometric, signing, and pavement marking design standards and guidelines of the City of Portage and the MMUTCD.

6 Bibliography

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Institute of Transportation Engineers. (2012). *Trip Generation Manual, 9th Edition*. Washington DC.
Stover, V. G., & Koepke, F. J. (2006). *Transportation and Land Development* (Vol. 2nd Edition).
Washington DC: Institute of Transportation Engineers (ITE).
City of Portage. (2005). *City of Portage Contract Conditions and Specifications*

Appendix A

SITE PLAN INFORMATION

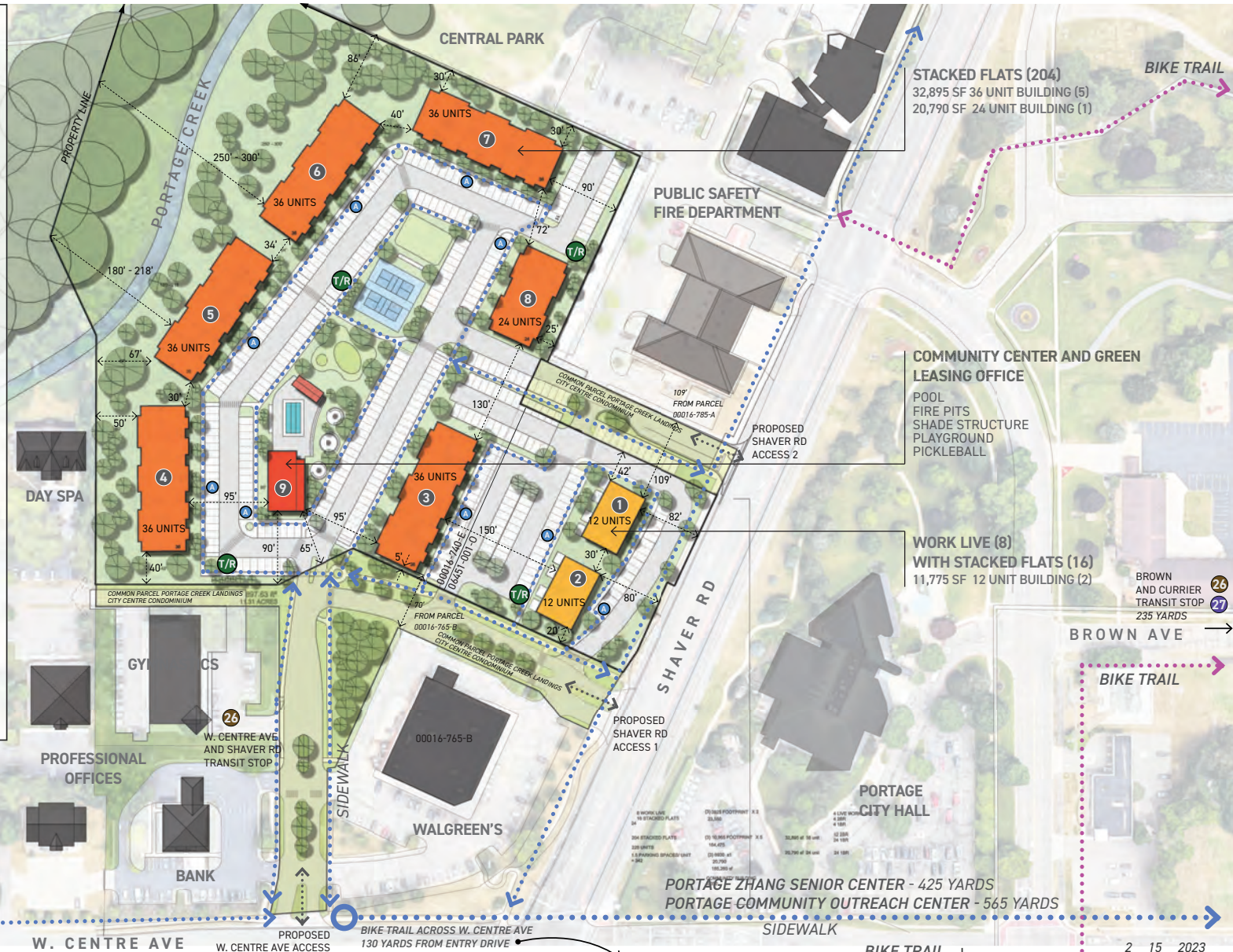
WORK/LIVE	BLDG 36(5)	BLDG 24(1)	WK/LV (2)	TOTAL	NOTES
1 BR UNIT	24	24	8	152	3 SIZES
2 BR UNIT	12	0	8	68	-
TOTAL	180	24	24	228	ESTIMATED

(2) WORK/LIVE	11,775 SF	23,550 SF
(5) BUILDING 36	32,895 SF	164,475 SF
(1) BUILDING 24	20,790 SF	20,790 SF
COMMUNITY BUILDING	3,350 SF	3,350 SF
TOTAL GSF		212,165 GSF

PARKING | 359 SPACES (9 ACCESSIBLE SPACES, 8 REQUIRED)
1.57 SPACES/UNIT - ESTIMATED

SITE AREA | ~462,170 SF
~10.61 ACRES
RESIDENTIAL UNIT DENSITY | 228 UNITS
21.5 UNITS/ACRE

- ACCESSIBLE PARKING SPACE
- TRASH/RECYCLE ENCLOSURE
- SIDEWALK - INTERNAL
- SIDEWALK
- BIKE PATH
- KALAMAZOO METRO TRANSIT
- BROWN AND CURRIER TRANSIT STOP
- W. CENTRE AVE AND SHAVER RD TRANSIT STOP
- SETBACK



SITE PLAN A | SCHEMATIC DESIGN - SCALE 1" = 120'

0' 60' 120' 240' ↑ N

BIKE TRAIL | PROJECT NARRATIVE
RIVER CADDIS MULTI-FAMILY DEVELOPMENT | PD APPLICATION

2 15 2023
1 17 2023
1 10 2023
12 5 2022
2022 10 02

Appendix B

EXISTING TRAFFIC DATA

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					W Centre Ave Westbound					Shaver Rd Northbound					W Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:00AM	10	36	6	0	52	0	88	23	0	111	33	34	20	0	87	18	156	12	0	186	436
7:15AM	13	43	6	0	62	0	189	28	0	217	35	60	29	0	124	33	249	32	0	314	717
7:30AM	11	50	0	0	61	4	222	35	0	261	19	47	25	0	91	25	173	19	0	217	630
7:45AM	28	44	4	0	76	4	124	36	0	164	17	61	18	0	96	38	151	18	0	207	543
Hourly Total	62	173	16	0	251	8	623	122	0	753	104	202	92	0	398	114	729	81	0	924	2326
8:00AM	17	36	7	0	60	4	101	39	0	144	32	66	17	0	115	35	134	17	0	186	505
8:15AM	23	51	7	0	81	3	126	28	0	157	23	54	28	0	105	36	117	23	0	176	519
8:30AM	24	33	12	0	69	7	135	38	0	180	25	66	27	0	118	28	131	21	0	180	547
8:45AM	22	47	8	0	77	4	133	28	0	165	27	46	25	0	98	39	112	42	0	193	533
Hourly Total	86	167	34	0	287	18	495	133	0	646	107	232	97	0	436	138	494	103	0	735	2104
4:00PM	35	160	11	0	206	3	191	51	0	245	72	112	53	0	237	61	134	49	0	244	932
4:15PM	37	129	23	0	189	6	206	45	0	257	48	90	47	0	185	57	150	52	0	259	890
4:30PM	31	102	19	0	152	10	187	43	0	240	60	97	45	0	202	57	135	42	0	234	828
4:45PM	27	116	6	0	149	6	184	41	0	231	34	93	37	0	164	43	165	47	0	255	799
Hourly Total	130	507	59	0	696	25	768	180	0	973	214	392	182	0	788	218	584	190	0	992	3449
5:00PM	52	130	12	0	194	7	181	39	0	227	61	105	54	0	220	67	134	47	0	248	889
5:15PM	43	132	17	0	192	8	200	43	0	251	46	92	52	0	190	54	187	34	0	275	908
5:30PM	31	108	7	0	146	5	160	44	0	209	51	80	49	0	180	42	129	43	0	214	749
5:45PM	25	101	15	0	141	4	116	30	0	150	41	85	25	0	151	44	119	34	0	197	639
Hourly Total	151	471	51	0	673	24	657	156	0	837	199	362	180	0	741	207	569	158	0	934	3185
Total	429	1318	160	0	1907	75	2543	591	0	3209	624	1188	551	0	2363	677	2376	532	0	3585	11064
% Approach	22.5%	69.1%	8.4%	0%	-	2.3%	79.2%	18.4%	0%	-	26.4%	50.3%	23.3%	0%	-	18.9%	66.3%	14.8%	0%	-	-
% Total	3.9%	11.9%	1.4%	0%	17.2%	0.7%	23.0%	5.3%	0%	29.0%	5.6%	10.7%	5.0%	0%	21.4%	6.1%	21.5%	4.8%	0%	32.4%	-
Lights and Motorcycles	426	1287	157	0	1870	73	2506	571	0	3150	617	1158	528	0	2303	664	2316	524	0	3504	10827
% Lights and Motorcycles	99.3%	97.6%	98.1%	0%	98.1%	97.3%	98.5%	96.6%	0%	98.2%	98.9%	97.5%	95.8%	0%	97.5%	98.1%	97.5%	98.5%	0%	97.7%	97.9%
Heavy	3	31	3	0	37	2	37	20	0	59	7	30	23	0	60	13	60	8	0	81	237
% Heavy	0.7%	2.4%	1.9%	0%	1.9%	2.7%	1.5%	3.4%	0%	1.8%	1.1%	2.5%	4.2%	0%	2.5%	1.9%	2.5%	1.5%	0%	2.3%	2.1%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

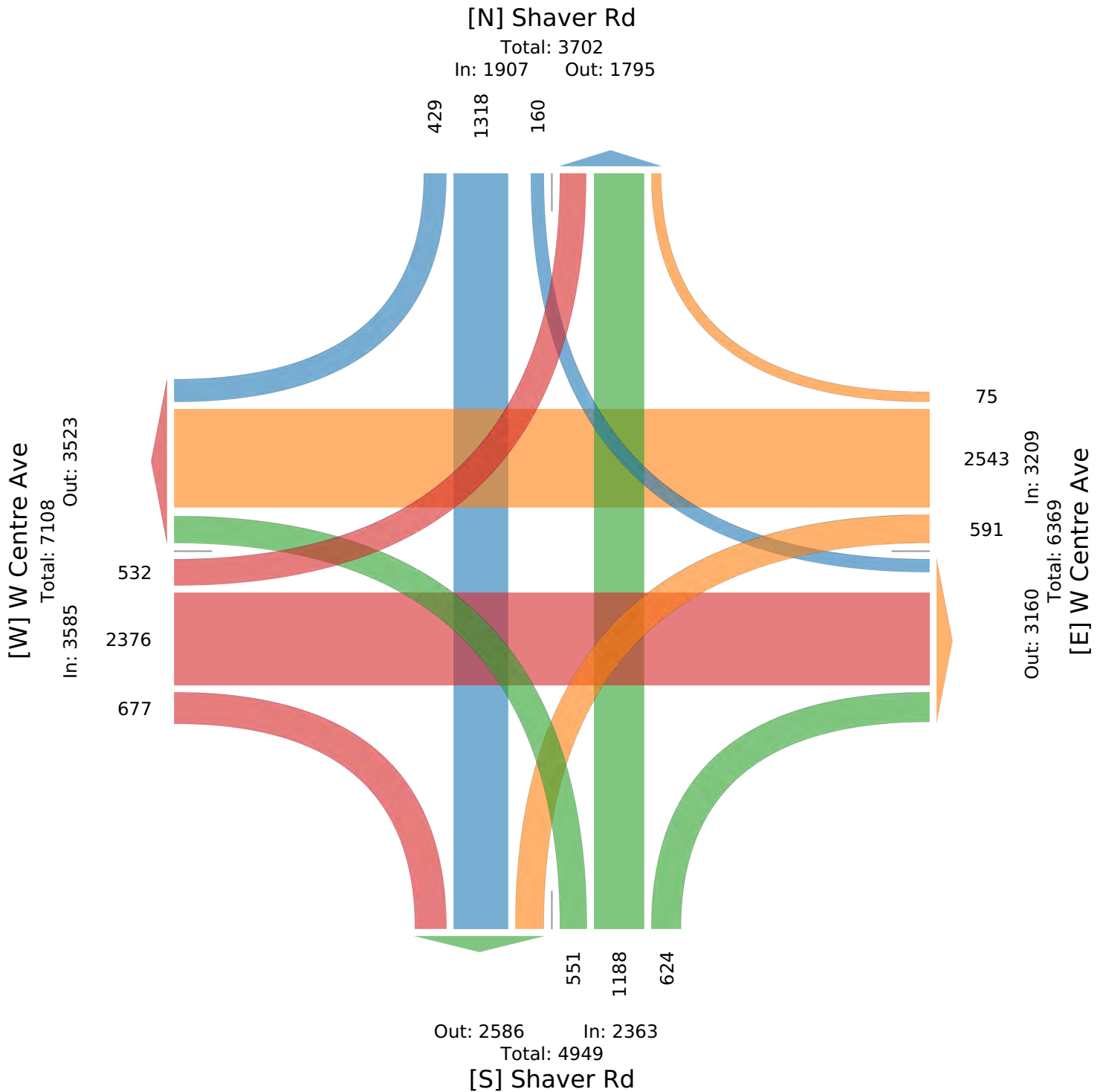
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					W Centre Ave Westbound					Shaver Rd Northbound					W Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:15AM	13	43	6	0	62	0	189	28	0	217	35	60	29	0	124	33	249	32	0	314	717
7:30AM	11	50	0	0	61	4	222	35	0	261	19	47	25	0	91	25	173	19	0	217	630
7:45AM	28	44	4	0	76	4	124	36	0	164	17	61	18	0	96	38	151	18	0	207	543
8:00AM	17	36	7	0	60	4	101	39	0	144	32	66	17	0	115	35	134	17	0	186	505
Total	69	173	17	0	259	12	636	138	0	786	103	234	89	0	426	131	707	86	0	924	2395
% Approach	26.6%	66.8%	6.6%	0%	-	1.5%	80.9%	17.6%	0%	-	24.2%	54.9%	20.9%	0%	-	14.2%	76.5%	9.3%	0%	-	-
% Total	2.9%	7.2%	0.7%	0%	10.8%	0.5%	26.6%	5.8%	0%	32.8%	4.3%	9.8%	3.7%	0%	17.8%	5.5%	29.5%	3.6%	0%	38.6%	-
PHF	0.616	0.865	0.607	-	0.852	0.750	0.716	0.885	-	0.753	0.736	0.886	0.767	-	0.859	0.862	0.710	0.672	-	0.736	0.835
Lights and Motorcycles	69	167	16	0	252	12	620	133	0	765	101	225	80	0	406	128	696	84	0	908	2331
% Lights and Motorcycles	100%	96.5%	94.1%	0%	97.3%	100%	97.5%	96.4%	0%	97.3%	98.1%	96.2%	89.9%	0%	95.3%	97.7%	98.4%	97.7%	0%	98.3%	97.3%
Heavy	0	6	1	0	7	0	16	5	0	21	2	9	9	0	20	3	11	2	0	16	64
% Heavy	0%	3.5%	5.9%	0%	2.7%	0%	2.5%	3.6%	0%	2.7%	1.9%	3.8%	10.1%	0%	4.7%	2.3%	1.6%	2.3%	0%	1.7%	2.7%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Shaver Rd

Total: 591

In: 259 Out: 332

69 173 17

[W] W Centre Ave
Total: 1718
In: 924 Out: 794

86
707
131

12
636
138

Out: 827 In: 786
Total: 1613
[E] W Centre Ave

Out: 442 In: 426
Total: 868

[S] Shaver Rd

89 234 103

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					W Centre Ave Westbound					Shaver Rd Northbound					W Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 4:00PM	35	160	11	0	206	3	191	51	0	245	72	112	53	0	237	61	134	49	0	244	932
4:15PM	37	129	23	0	189	6	206	45	0	257	48	90	47	0	185	57	150	52	0	259	890
4:30PM	31	102	19	0	152	10	187	43	0	240	60	97	45	0	202	57	135	42	0	234	828
4:45PM	27	116	6	0	149	6	184	41	0	231	34	93	37	0	164	43	165	47	0	255	799
Total	130	507	59	0	696	25	768	180	0	973	214	392	182	0	788	218	584	190	0	992	3449
% Approach	18.7%	72.8%	8.5%	0%	-	2.6%	78.9%	18.5%	0%	-	27.2%	49.7%	23.1%	0%	-	22.0%	58.9%	19.2%	0%	-	-
% Total	3.8%	14.7%	1.7%	0%	20.2%	0.7%	22.3%	5.2%	0%	28.2%	6.2%	11.4%	5.3%	0%	22.8%	6.3%	16.9%	5.5%	0%	28.8%	-
PHF	0.878	0.792	0.641	-	0.845	0.625	0.932	0.882	-	0.946	0.743	0.875	0.858	-	0.831	0.893	0.885	0.913	-	0.958	0.925
Lights and Motorcycles	130	501	58	0	689	25	763	177	0	965	211	389	179	0	779	216	558	188	0	962	3395
% Lights and Motorcycles	100%	98.8%	98.3%	0%	99.0%	100%	99.3%	98.3%	0%	99.2%	98.6%	99.2%	98.4%	0%	98.9%	99.1%	95.5%	98.9%	0%	97.0%	98.4%
Heavy	0	6	1	0	7	0	5	3	0	8	3	3	3	0	9	2	26	2	0	30	54
% Heavy	0%	1.2%	1.7%	0%	1.0%	0%	0.7%	1.7%	0%	0.8%	1.4%	0.8%	1.6%	0%	1.1%	0.9%	4.5%	1.1%	0%	3.0%	1.6%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023344, Location: 42.200965, -85.591684

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Shaver Rd

Total: 1303

In: 696

Out: 607

130

507

59

[W] W Centre Ave

Total: 2072

Out: 1080

In: 992

190

584

218

25

768

180

Out: 857

In: 973

Total: 1830

[E] W Centre Ave

Out: 905

In: 788

Total: 1693

[S] Shaver Rd

182

392

214

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					Westnedge Ave Westbound					Shaver Rd Northbound					Westnedge Rd Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:00AM	0	56	54	0	110	32	1	0	0	33	2	43	0	0	45	2	1	3	0	6	194
7:15AM	3	60	91	0	154	82	1	2	0	85	18	69	1	0	88	1	0	0	0	1	328
7:30AM	0	67	51	0	118	75	1	1	1	78	4	68	1	0	73	1	0	0	0	1	270
7:45AM	2	80	44	0	126	43	1	1	0	45	3	75	1	0	79	0	0	0	0	0	250
Hourly Total	5	263	240	0	508	232	4	4	1	241	27	255	3	0	285	4	1	3	0	8	1042
8:00AM	1	56	43	0	100	40	0	1	0	41	6	82	0	0	88	0	0	1	0	1	230
8:15AM	1	79	47	0	127	49	1	1	0	51	0	77	0	0	77	2	1	0	0	3	258
8:30AM	0	73	47	0	120	54	0	0	0	54	2	91	0	0	93	0	1	1	0	2	269
8:45AM	0	82	47	0	129	59	1	1	0	61	5	85	1	0	91	0	0	1	0	1	282
Hourly Total	2	290	184	0	476	202	2	3	0	207	13	335	1	0	349	2	2	3	0	7	1039
4:00PM	0	218	67	0	285	74	1	4	1	80	6	151	0	0	157	3	1	2	0	6	528
4:15PM	0	184	82	0	266	71	2	0	0	73	3	154	2	0	159	0	0	2	0	2	500
4:30PM	1	157	71	0	229	88	2	4	0	94	4	126	1	0	131	1	1	1	0	3	457
4:45PM	0	142	89	0	231	99	0	5	2	106	2	148	0	0	150	4	3	1	0	8	495
Hourly Total	1	701	309	0	1011	332	5	13	3	353	15	579	3	0	597	8	5	6	0	19	1980
5:00PM	1	193	87	0	281	89	0	4	0	93	2	145	0	0	147	3	2	2	0	7	528
5:15PM	0	196	100	0	296	68	2	6	0	76	2	133	1	0	136	1	2	0	0	3	511
5:30PM	0	154	72	0	226	78	3	4	0	85	1	130	0	0	131	0	1	0	0	1	443
5:45PM	0	138	54	0	192	73	0	4	0	77	0	131	1	0	132	2	0	0	0	2	403
Hourly Total	1	681	313	0	995	308	5	18	0	331	5	539	2	0	546	6	5	2	0	13	1885
Total	9	1935	1046	0	2990	1074	16	38	4	1132	60	1708	9	0	1777	20	13	14	0	47	5946
% Approach	0.3%	64.7%	35.0%	0%	-	94.9%	1.4%	3.4%	0.4%	-	3.4%	96.1%	0.5%	0%	-	42.6%	27.7%	29.8%	0%	-	-
% Total	0.2%	32.5%	17.6%	0%	50.3%	18.1%	0.3%	0.6%	0.1%	19.0%	1.0%	28.7%	0.2%	0%	29.9%	0.3%	0.2%	0.2%	0%	0.8%	-
Lights and Motorcycles	9	1901	1018	0	2928	1058	15	38	4	1115	60	1668	9	0	1737	17	13	14	0	44	5824
% Lights and Motorcycles	100%	98.2%	97.3%	0%	97.9%	98.5%	93.8%	100%	100%	98.5%	100%	97.7%	100%	0%	97.7%	85.0%	100%	100%	0%	93.6%	97.9%
Heavy	0	34	28	0	62	16	1	0	0	17	0	40	0	0	40	3	0	0	0	3	122
% Heavy	0%	1.8%	2.7%	0%	2.1%	1.5%	6.3%	0%	0%	1.5%	0%	2.3%	0%	0%	2.3%	15.0%	0%	0%	0%	6.4%	2.1%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

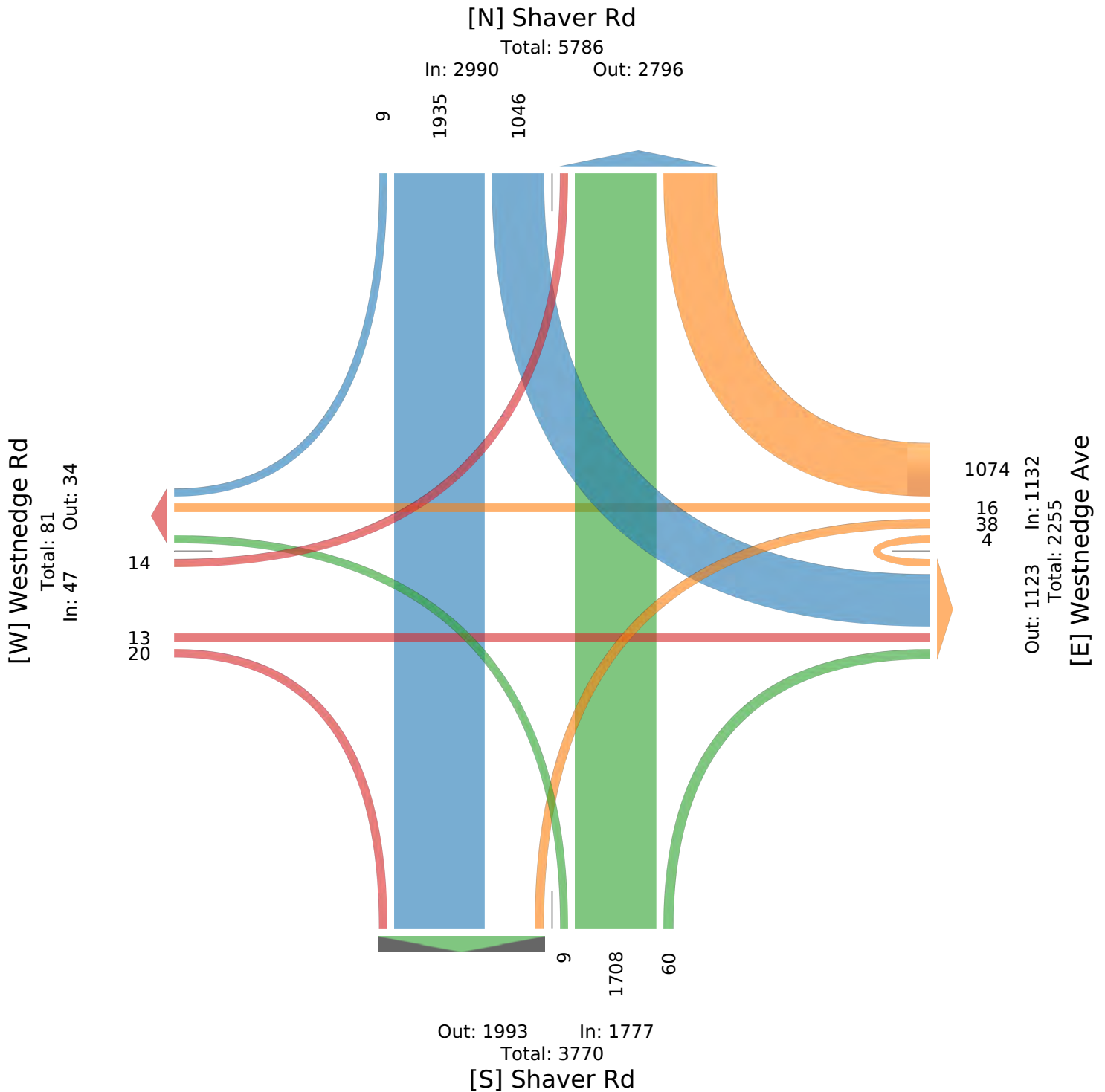
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

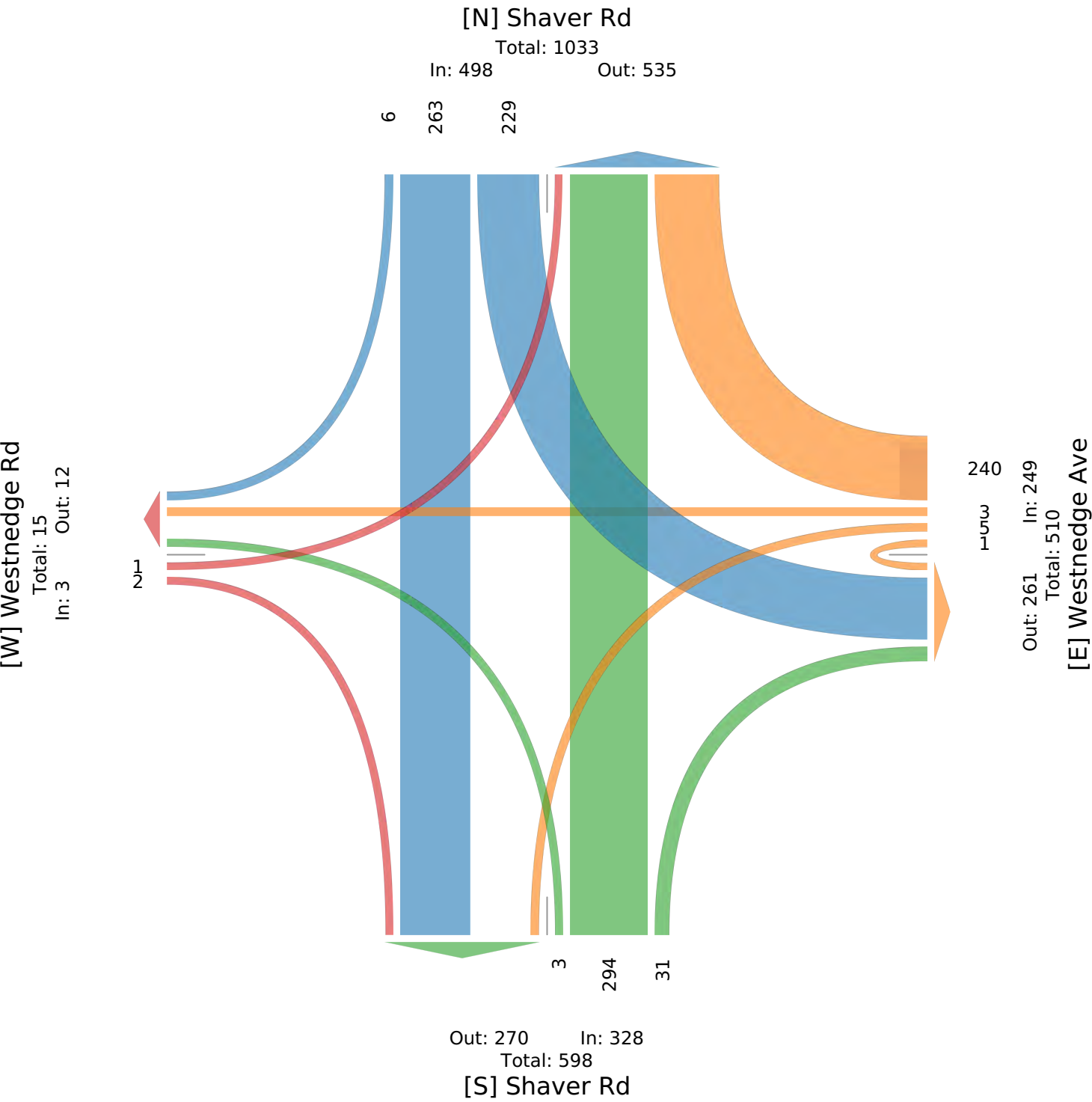
All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					Westnedge Ave Westbound					Shaver Rd Northbound					Westnedge Rd Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 7:15AM	3	60	91	0	154	82	1	2	0	85	18	69	1	0	88	1	0	0	0	1	328
7:30AM	0	67	51	0	118	75	1	1	1	78	4	68	1	0	73	1	0	0	0	1	270
7:45AM	2	80	44	0	126	43	1	1	0	45	3	75	1	0	79	0	0	0	0	0	250
8:00AM	1	56	43	0	100	40	0	1	0	41	6	82	0	0	88	0	0	1	0	1	230
Total	6	263	229	0	498	240	3	5	1	249	31	294	3	0	328	2	0	1	0	3	1078
% Approach	1.2%	52.8%	46.0%	0%	-	96.4%	1.2%	2.0%	0.4%	-	9.5%	89.6%	0.9%	0%	-	66.7%	0%	33.3%	0%	-	-
% Total	0.6%	24.4%	21.2%	0%	46.2%	22.3%	0.3%	0.5%	0.1%	23.1%	2.9%	27.3%	0.3%	0%	30.4%	0.2%	0%	0.1%	0%	0.3%	-
PHF	0.500	0.822	0.629	-	0.808	0.732	0.750	0.625	0.250	0.732	0.431	0.896	0.750	-	0.932	0.500	-	0.250	-	0.750	0.822
Lights and Motorcycles	6	255	220	0	481	233	3	5	1	242	31	282	3	0	316	1	0	1	0	2	1041
% Lights and Motorcycles	100%	97.0%	96.1%	0%	96.6%	97.1%	100%	100%	100%	97.2%	100%	95.9%	100%	0%	96.3%	50.0%	0%	100%	0%	66.7%	96.6%
Heavy	0	8	9	0	17	7	0	0	0	7	0	12	0	0	12	1	0	0	0	1	37
% Heavy	0%	3.0%	3.9%	0%	3.4%	2.9%	0%	0%	0%	2.8%	0%	4.1%	0%	0%	3.7%	50.0%	0%	0%	0%	33.3%	3.4%

* L: Left, R: Right, T: Thru, U: U-Turn



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound					Westnedge Ave Westbound					Shaver Rd Northbound					Westnedge Rd Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-06 4:30PM	1	157	71	0	229	88	2	4	0	94	4	126	1	0	131	1	1	1	0	3	457
4:45PM	0	142	89	0	231	99	0	5	2	106	2	148	0	0	150	4	3	1	0	8	495
5:00PM	1	193	87	0	281	89	0	4	0	93	2	145	0	0	147	3	2	2	0	7	528
5:15PM	0	196	100	0	296	68	2	6	0	76	2	133	1	0	136	1	2	0	0	3	511
Total	2	688	347	0	1037	344	4	19	2	369	10	552	2	0	564	9	8	4	0	21	1991
% Approach	0.2%	66.3%	33.5%	0%	-	93.2%	1.1%	5.1%	0.5%	-	1.8%	97.9%	0.4%	0%	-	42.9%	38.1%	19.0%	0%	-	-
% Total	0.1%	34.6%	17.4%	0%	52.1%	17.3%	0.2%	1.0%	0.1%	18.5%	0.5%	27.7%	0.1%	0%	28.3%	0.5%	0.4%	0.2%	0%	1.1%	-
PHF	0.500	0.878	0.868	-	0.876	0.869	0.500	0.792	0.250	0.870	0.625	0.932	0.500	-	0.940	0.563	0.667	0.500	-	0.656	0.943
Lights and Motorcycles	2	682	345	0	1029	343	4	19	2	368	10	545	2	0	557	9	8	4	0	21	1975
% Lights and Motorcycles	100%	99.1%	99.4%	0%	99.2%	99.7%	100%	100%	100%	99.7%	100%	98.7%	100%	0%	98.8%	100%	100%	100%	0%	100%	99.2%
Heavy	0	6	2	0	8	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	16
% Heavy	0%	0.9%	0.6%	0%	0.8%	0.3%	0%	0%	0%	0.3%	0%	1.3%	0%	0%	1.2%	0%	0%	0%	0%	0%	0.8%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

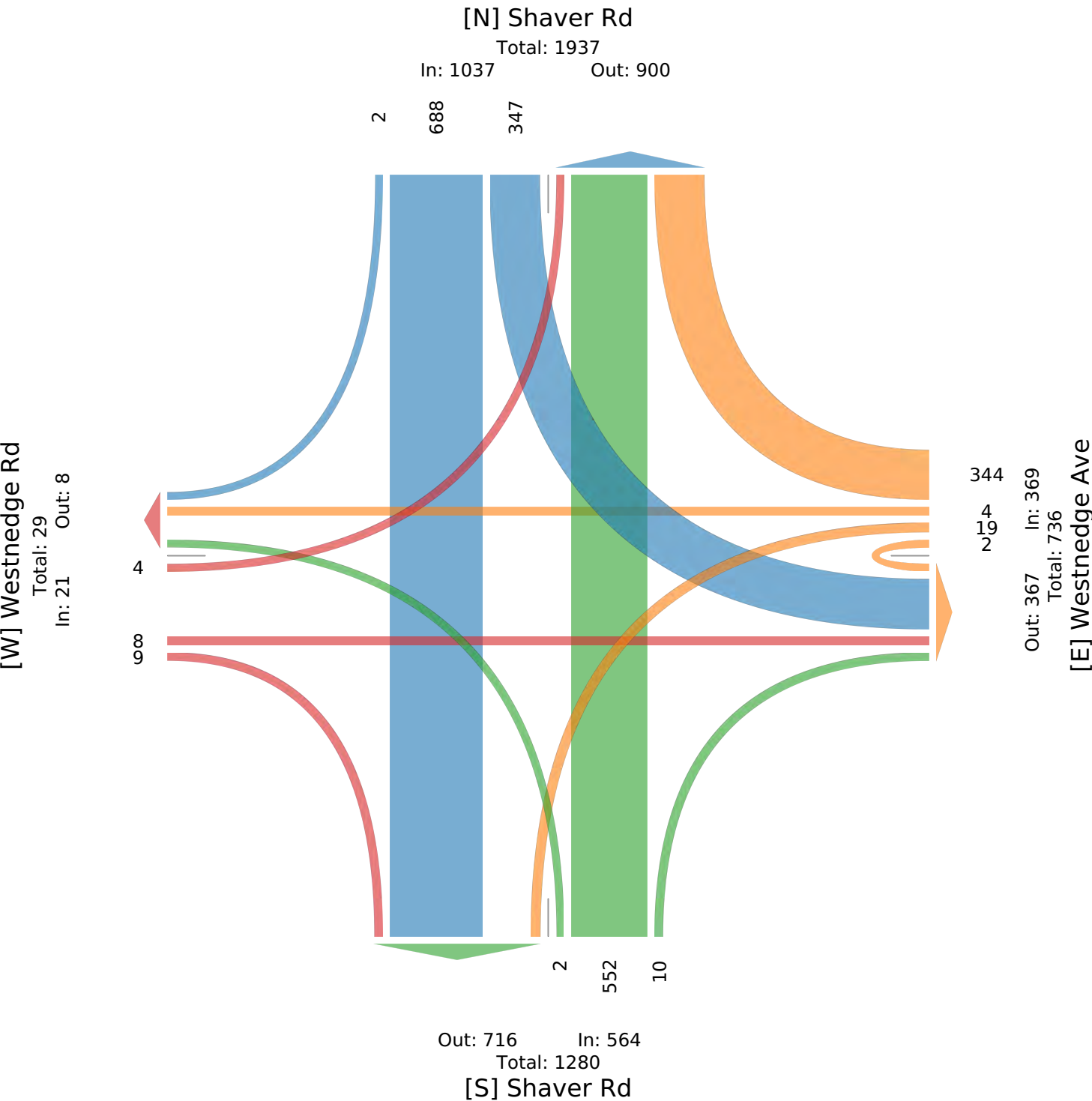
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023358, Location: 42.203342, -85.590233

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Westnedge Ave Southbound					Centre Ave Westbound					Westnedge Ave Northbound					Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-08 7:00AM	1	32	28	0	61	10	79	22	0	111	25	25	27	0	77	40	121	0	0	161	410
7:15AM	0	40	43	0	83	19	124	49	0	192	50	46	58	0	154	41	228	2	0	271	700
7:30AM	1	31	19	0	51	9	180	25	0	214	61	53	62	0	176	30	183	4	0	217	658
7:45AM	1	13	17	0	31	14	136	15	0	165	33	29	27	0	89	16	174	6	0	196	481
Hourly Total	3	116	107	0	226	52	519	111	0	682	169	153	174	0	496	127	706	12	0	845	2249
8:00AM	1	24	13	0	38	16	109	23	0	148	21	37	28	0	86	19	114	2	0	135	407
8:15AM	0	12	13	0	25	13	125	54	0	192	30	31	27	0	88	17	133	7	1	158	463
8:30AM	1	13	23	0	37	19	123	29	0	171	35	28	43	0	106	9	113	3	0	125	439
8:45AM	1	19	21	0	41	11	128	20	0	159	16	24	26	0	66	14	139	14	0	167	433
Hourly Total	3	68	70	0	141	59	485	126	0	670	102	120	124	0	346	59	499	26	1	585	1742
4:00PM	7	48	33	0	88	30	205	35	0	270	37	39	35	0	111	30	179	5	0	214	683
4:15PM	3	34	29	0	66	31	172	45	0	248	27	31	30	0	88	33	162	8	0	203	605
4:30PM	3	44	21	0	68	22	206	35	0	263	29	34	29	0	92	37	184	4	0	225	648
4:45PM	3	33	32	0	68	29	188	43	0	260	27	39	23	0	89	36	183	9	0	228	645
Hourly Total	16	159	115	0	290	112	771	158	0	1041	120	143	117	0	380	136	708	26	0	870	2581
5:00PM	5	51	43	0	99	18	208	35	0	261	29	56	33	0	118	31	185	5	0	221	699
5:15PM	2	49	24	0	75	21	221	56	0	298	28	26	38	0	92	62	190	8	0	260	725
5:30PM	2	38	31	0	71	30	159	38	0	227	39	44	33	0	116	37	192	4	0	233	647
5:45PM	1	53	31	0	85	21	136	25	0	182	52	55	46	0	153	32	140	8	0	180	600
Hourly Total	10	191	129	0	330	90	724	154	0	968	148	181	150	0	479	162	707	25	0	894	2671
Total	32	534	421	0	987	313	2499	549	0	3361	539	597	565	0	1701	484	2620	89	1	3194	9243
% Approach	3.2%	54.1%	42.7%	0%	-	9.3%	74.4%	16.3%	0%	-	31.7%	35.1%	33.2%	0%	-	15.2%	82.0%	2.8%	0%	-	-
% Total	0.3%	5.8%	4.6%	0%	10.7%	3.4%	27.0%	5.9%	0%	36.4%	5.8%	6.5%	6.1%	0%	18.4%	5.2%	28.3%	1.0%	0%	34.6%	-
Lights and Motorcycles	28	523	404	0	955	312	2450	534	0	3296	519	583	557	0	1659	472	2550	89	1	3112	9022
% Lights and Motorcycles	87.5%	97.9%	96.0%	0%	96.8%	99.7%	98.0%	97.3%	0%	98.1%	96.3%	97.7%	98.6%	0%	97.5%	97.5%	97.3%	100%	100%	97.4%	97.6%
Heavy	4	11	17	0	32	1	49	15	0	65	20	14	8	0	42	12	70	0	0	82	221
% Heavy	12.5%	2.1%	4.0%	0%	3.2%	0.3%	2.0%	2.7%	0%	1.9%	3.7%	2.3%	1.4%	0%	2.5%	2.5%	2.7%	0%	0%	2.6%	2.4%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

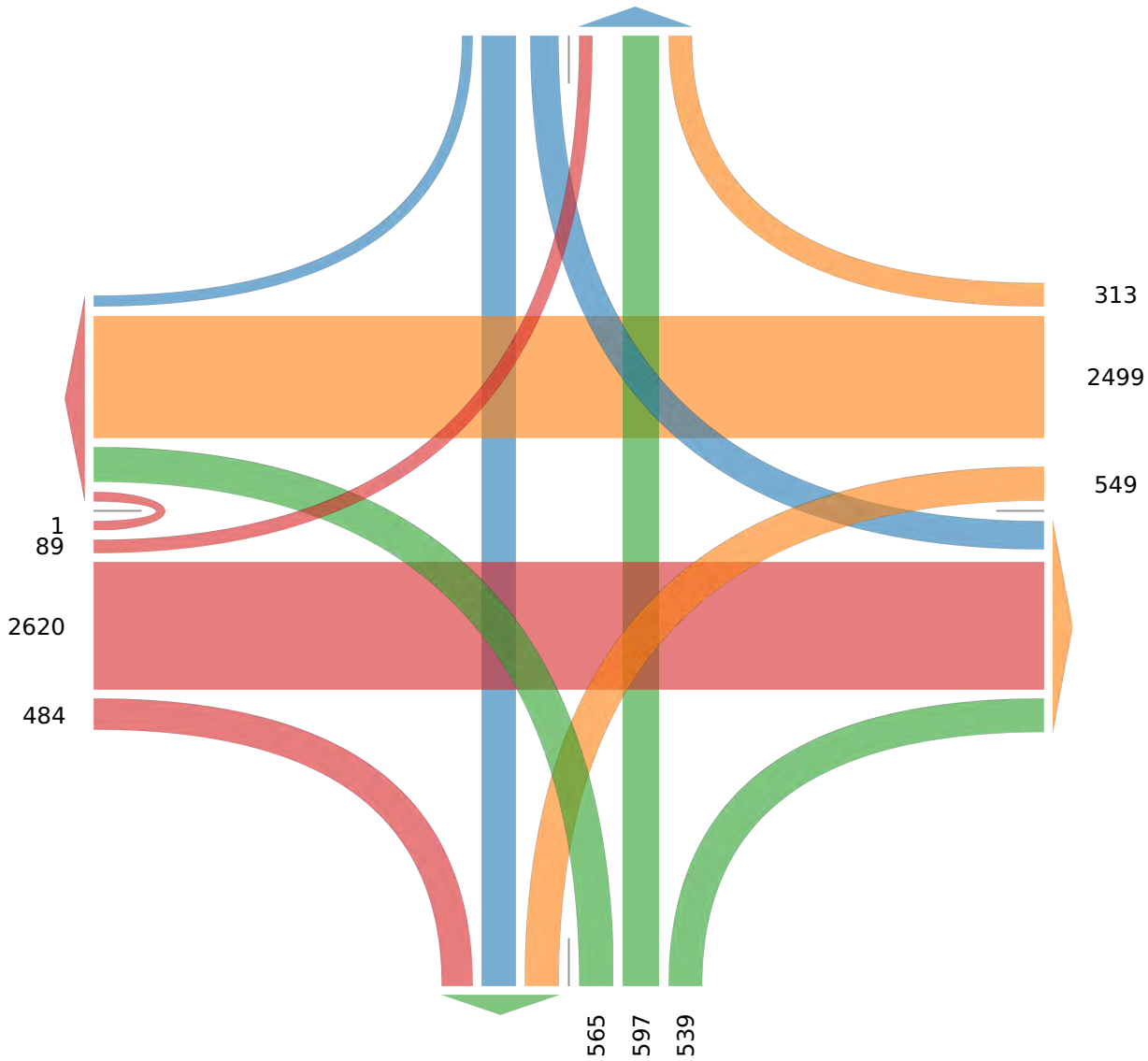
[N] Westnedge Ave

Total: 1986

In: 987 Out: 999

32
534
421

[W] Centre Ave
Total: 6291
In: 3194 Out: 3097



[E] Centre Ave
Total: 6941
In: 3361 Out: 3580

Out: 1567 In: 1701
Total: 3268
[S] Westnedge Ave

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Westnedge Ave Southbound					Centre Ave Westbound					Westnedge Ave Northbound					Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-08 7:00AM	1	32	28	0	61	10	79	22	0	111	25	25	27	0	77	40	121	0	0	161	410
7:15AM	0	40	43	0	83	19	124	49	0	192	50	46	58	0	154	41	228	2	0	271	700
7:30AM	1	31	19	0	51	9	180	25	0	214	61	53	62	0	176	30	183	4	0	217	658
7:45AM	1	13	17	0	31	14	136	15	0	165	33	29	27	0	89	16	174	6	0	196	481
Total	3	116	107	0	226	52	519	111	0	682	169	153	174	0	496	127	706	12	0	845	2249
% Approach	1.3%	51.3%	47.3%	0%	-	7.6%	76.1%	16.3%	0%	-	34.1%	30.8%	35.1%	0%	-	15.0%	83.6%	1.4%	0%	-	-
% Total	0.1%	5.2%	4.8%	0%	10.0%	2.3%	23.1%	4.9%	0%	30.3%	7.5%	6.8%	7.7%	0%	22.1%	5.6%	31.4%	0.5%	0%	37.6%	-
PHF	0.750	0.725	0.622	-	0.681	0.684	0.721	0.566	-	0.797	0.693	0.722	0.702	-	0.705	0.774	0.774	0.500	-	0.780	0.803
Lights and Motorcycles	2	111	104	0	217	52	504	105	0	661	161	149	170	0	480	121	697	12	0	830	2188
% Lights and Motorcycles	66.7%	95.7%	97.2%	0%	96.0%	100%	97.1%	94.6%	0%	96.9%	95.3%	97.4%	97.7%	0%	96.8%	95.3%	98.7%	100%	0%	98.2%	97.3%
Heavy	1	5	3	0	9	0	15	6	0	21	8	4	4	0	16	6	9	0	0	15	61
% Heavy	33.3%	4.3%	2.8%	0%	4.0%	0%	2.9%	5.4%	0%	3.1%	4.7%	2.6%	2.3%	0%	3.2%	4.7%	1.3%	0%	0%	1.8%	2.7%

*L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Westnedge Ave

Total: 443

In: 226 Out: 217

3
116
107

[W] Centre Ave

Total: 1541

In: 845 Out: 696

12
706
127

52
519
111

Out: 982 In: 682

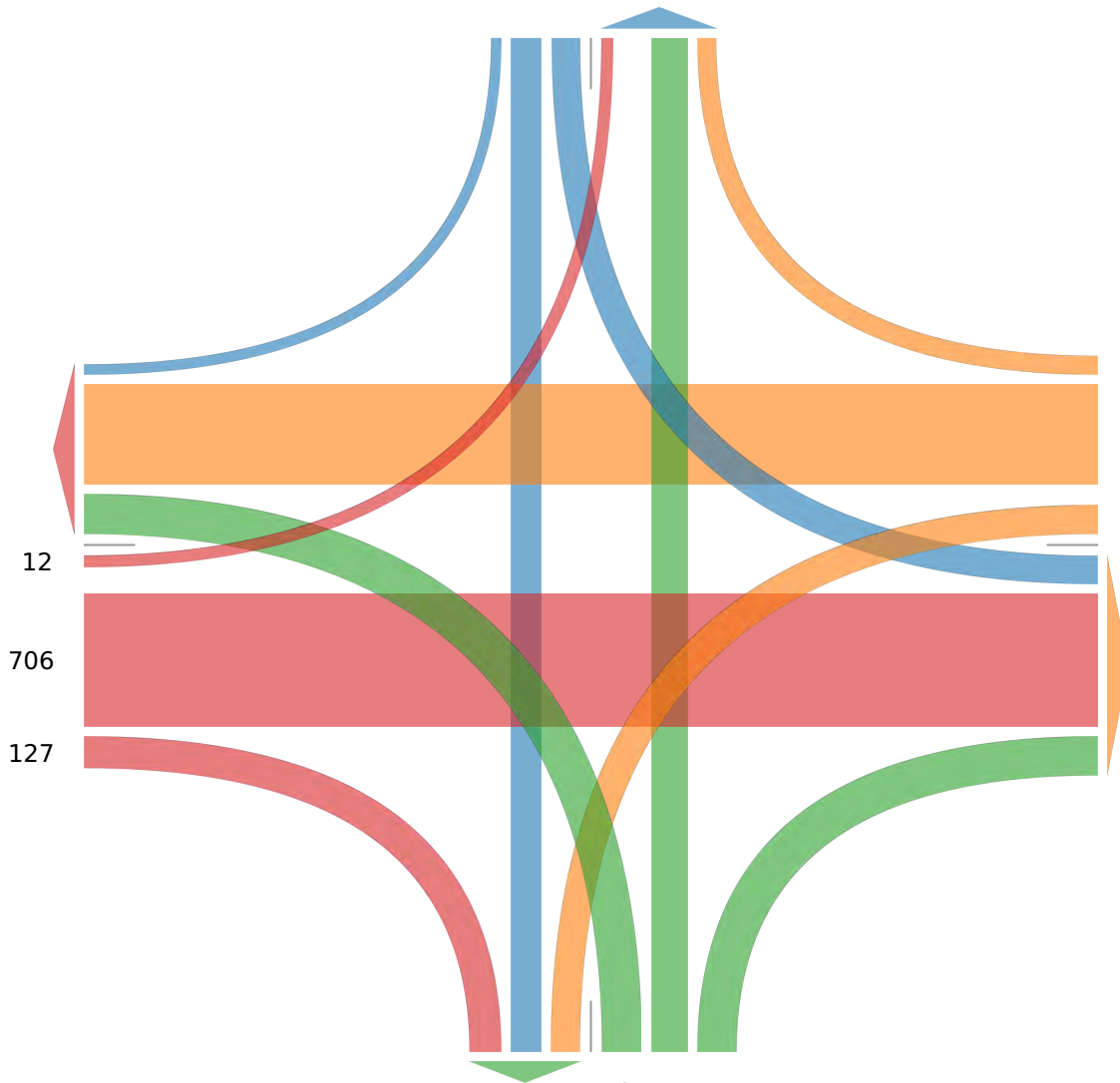
Total: 1664

[E] Centre Ave

Out: 354 In: 496
Total: 850

[S] Westnedge Ave

174
153
169



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

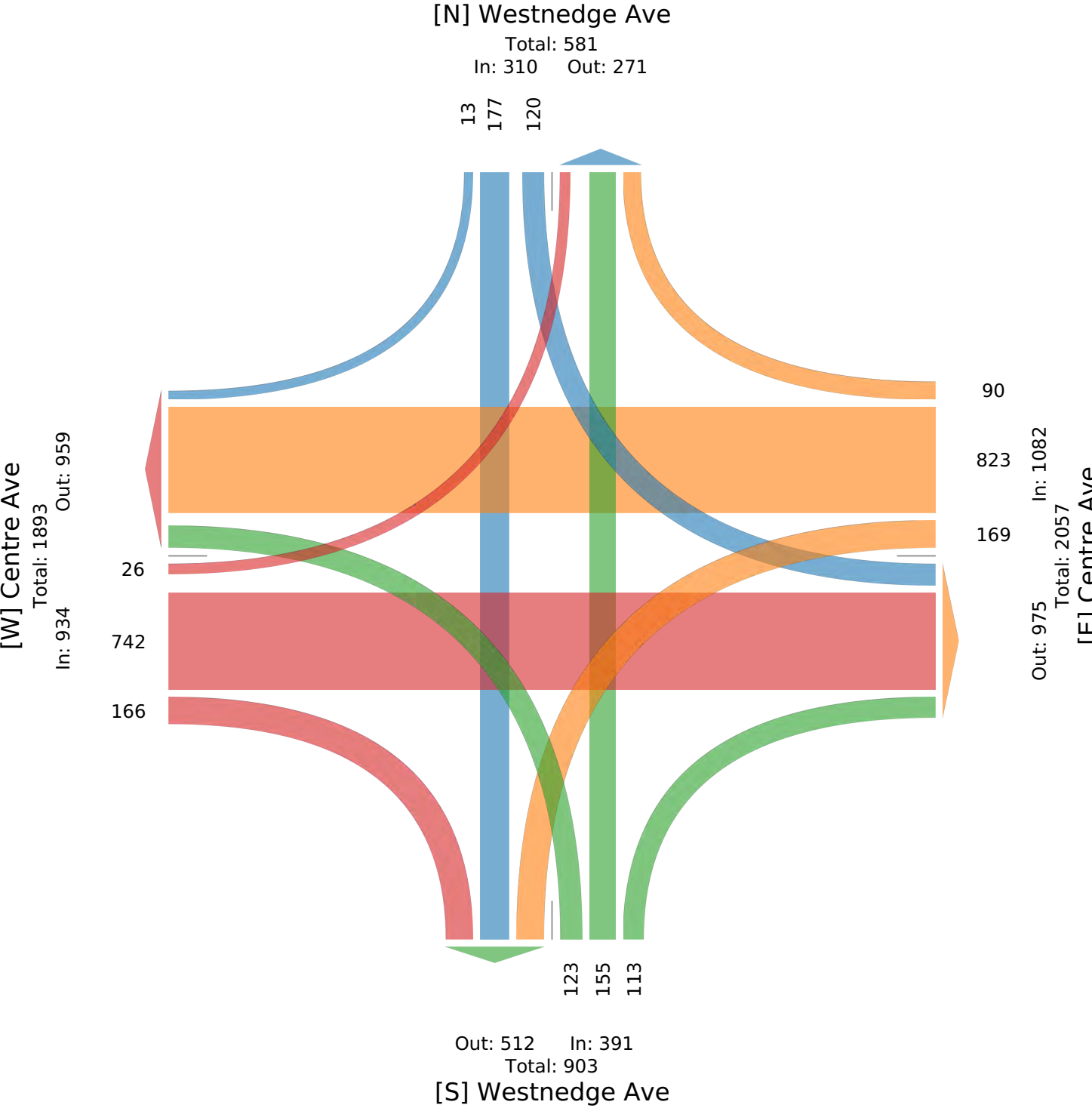
All Movements

ID: 1023357, Location: 42.200945, -85.589381

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Westnedge Ave Southbound					Centre Ave Westbound					Westnedge Ave Northbound					Centre Ave Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-12-08 4:30PM	3	44	21	0	68	22	206	35	0	263	29	34	29	0	92	37	184	4	0	225	648
4:45PM	3	33	32	0	68	29	188	43	0	260	27	39	23	0	89	36	183	9	0	228	645
5:00PM	5	51	43	0	99	18	208	35	0	261	29	56	33	0	118	31	185	5	0	221	699
5:15PM	2	49	24	0	75	21	221	56	0	298	28	26	38	0	92	62	190	8	0	260	725
Total	13	177	120	0	310	90	823	169	0	1082	113	155	123	0	391	166	742	26	0	934	2717
% Approach	4.2%	57.1%	38.7%	0%	-	8.3%	76.1%	15.6%	0%	-	28.9%	39.6%	31.5%	0%	-	17.8%	79.4%	2.8%	0%	-	-
% Total	0.5%	6.5%	4.4%	0%	11.4%	3.3%	30.3%	6.2%	0%	39.8%	4.2%	5.7%	4.5%	0%	14.4%	6.1%	27.3%	1.0%	0%	34.4%	-
PHF	0.650	0.868	0.698	-	0.783	0.776	0.931	0.754	-	0.908	0.974	0.692	0.809	-	0.828	0.669	0.976	0.722	-	0.898	0.937
Lights and Motorcycles	12	177	117	0	306	90	816	169	0	1075	113	154	121	0	388	165	728	26	0	919	2688
% Lights and Motorcycles	92.3%	100%	97.5%	0%	98.7%	100%	99.1%	100%	0%	99.4%	100%	99.4%	98.4%	0%	99.2%	99.4%	98.1%	100%	0%	98.4%	98.9%
Heavy	1	0	3	0	4	0	7	0	0	7	0	1	2	0	3	1	14	0	0	15	29
% Heavy	7.7%	0%	2.5%	0%	1.3%	0%	0.9%	0%	0%	0.6%	0%	0.6%	1.6%	0%	0.8%	0.6%	1.9%	0%	0%	1.6%	1.1%

* L: Left, R: Right, T: Thru, U: U-Turn



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound				Shaver Rd Northbound				Walgreen Driveway Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2022-12-06 7:00AM	4	48	0	52	44	0	0	44	3	1	0	4	100
7:15AM	0	65	0	65	93	0	0	93	2	0	0	2	160
7:30AM	0	70	0	70	74	0	0	74	0	1	0	1	145
7:45AM	6	75	0	81	84	0	0	84	1	0	0	1	166
Hourly Total	10	258	0	268	295	0	0	295	6	2	0	8	571
8:00AM	2	53	0	55	81	0	0	81	0	2	0	2	138
8:15AM	3	76	0	79	81	0	0	81	5	3	0	8	168
8:30AM	3	71	0	74	92	1	0	93	1	2	0	3	170
8:45AM	10	74	0	84	93	0	0	93	2	1	0	3	180
Hourly Total	18	274	0	292	347	1	0	348	8	8	0	16	656
4:00PM	17	208	0	225	161	2	0	163	5	6	0	11	399
4:15PM	18	167	0	185	146	1	0	147	13	3	0	16	348
4:30PM	10	149	0	159	149	0	0	149	8	3	0	11	319
4:45PM	8	150	0	158	145	1	0	146	6	4	0	10	314
Hourly Total	53	674	0	727	601	4	0	605	32	16	0	48	1380
5:00PM	14	182	0	196	153	0	0	153	8	2	0	10	359
5:15PM	7	196	0	203	133	2	0	135	9	3	0	12	350
5:30PM	11	149	0	160	122	0	0	122	3	3	0	6	288
5:45PM	15	134	0	149	116	0	0	116	11	1	0	12	277
Hourly Total	47	661	0	708	524	2	0	526	31	9	0	40	1274
Total	128	1867	0	1995	1767	7	0	1774	77	35	0	112	3881
% Approach	6.4%	93.6%	0%	-	99.6%	0.4%	0%	-	68.8%	31.3%	0%	-	-
% Total	3.3%	48.1%	0%	51.4%	45.5%	0.2%	0%	45.7%	2.0%	0.9%	0%	2.9%	-
Lights and Motorcycles	128	1832	0	1960	1733	7	0	1740	77	34	0	111	3811
% Lights and Motorcycles	100%	98.1%	0%	98.2%	98.1%	100%	0%	98.1%	100%	97.1%	0%	99.1%	98.2%
Heavy	0	35	0	35	34	0	0	34	0	1	0	1	70
% Heavy	0%	1.9%	0%	1.8%	1.9%	0%	0%	1.9%	0%	2.9%	0%	0.9%	1.8%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Shaver Rd

Total: 3797

In: 1995

Out: 1802

128

1867

35
77

7

1767

Out: 1944

In: 1774

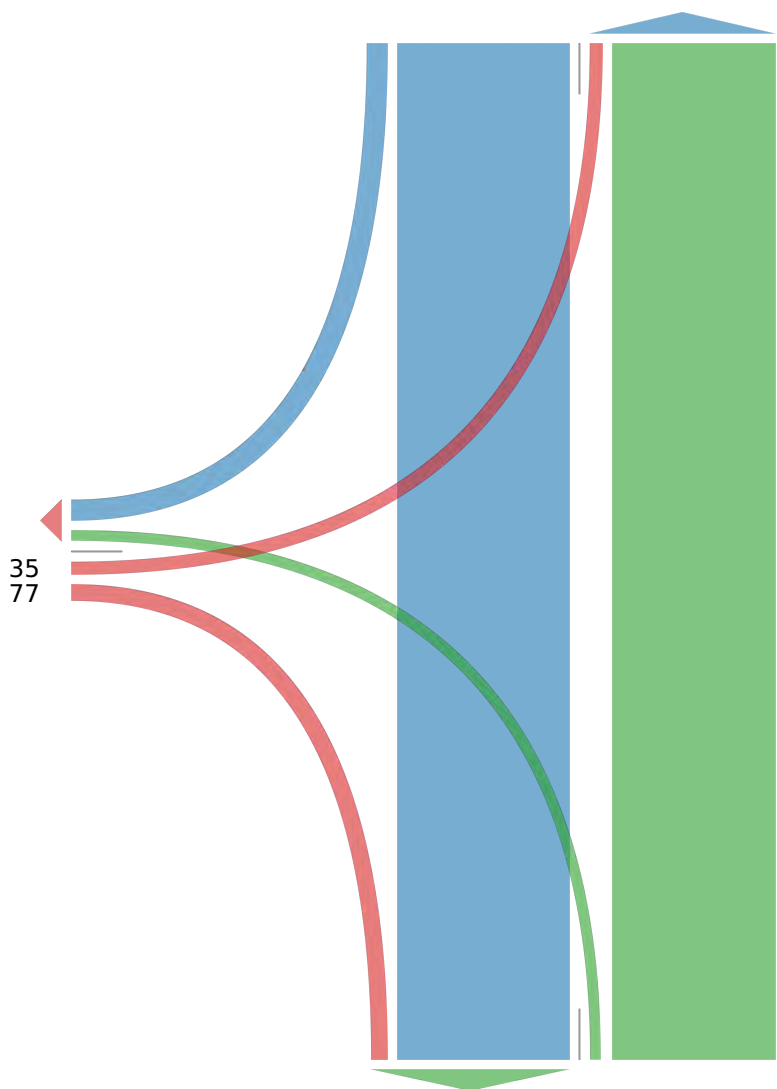
Total: 3718

[S] Shaver Rd

[W] Walgreen Driveway

Total: 247

In: 112 Out: 135



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

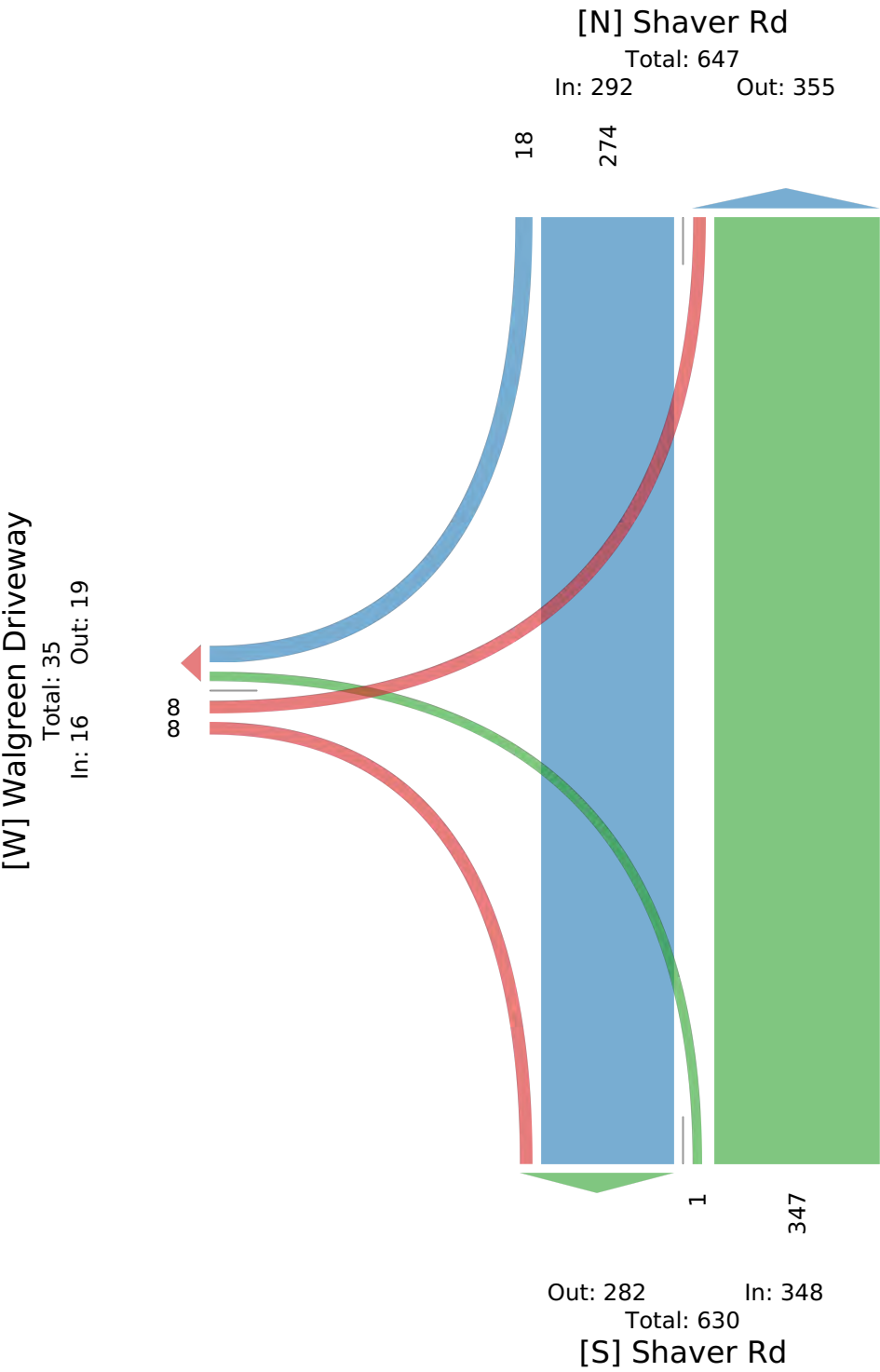
Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Shaver Rd Southbound				Shaver Rd Northbound				Walgreen Driveway Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2022-12-06 8:00AM	2	53	0	55	81	0	0	81	0	2	0	2	138
8:15AM	3	76	0	79	81	0	0	81	5	3	0	8	168
8:30AM	3	71	0	74	92	1	0	93	1	2	0	3	170
8:45AM	10	74	0	84	93	0	0	93	2	1	0	3	180
Total	18	274	0	292	347	1	0	348	8	8	0	16	656
% Approach	6.2%	93.8%	0%	-	99.7%	0.3%	0%	-	50.0%	50.0%	0%	-	-
% Total	2.7%	41.8%	0%	44.5%	52.9%	0.2%	0%	53.0%	1.2%	1.2%	0%	2.4%	-
PHF	0.450	0.901	-	0.869	0.933	0.250	-	0.935	0.400	0.667	-	0.500	0.911
Lights and Motorcycles	18	259	0	277	330	1	0	331	8	8	0	16	624
% Lights and Motorcycles	100%	94.5%	0%	94.9%	95.1%	100%	0%	95.1%	100%	100%	0%	100%	95.1%
Heavy	0	15	0	15	17	0	0	17	0	0	0	0	32
% Heavy	0%	5.5%	0%	5.1%	4.9%	0%	0%	4.9%	0%	0%	0%	0%	4.9%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC
Tue Dec 6, 2022
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Tue Dec 6, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

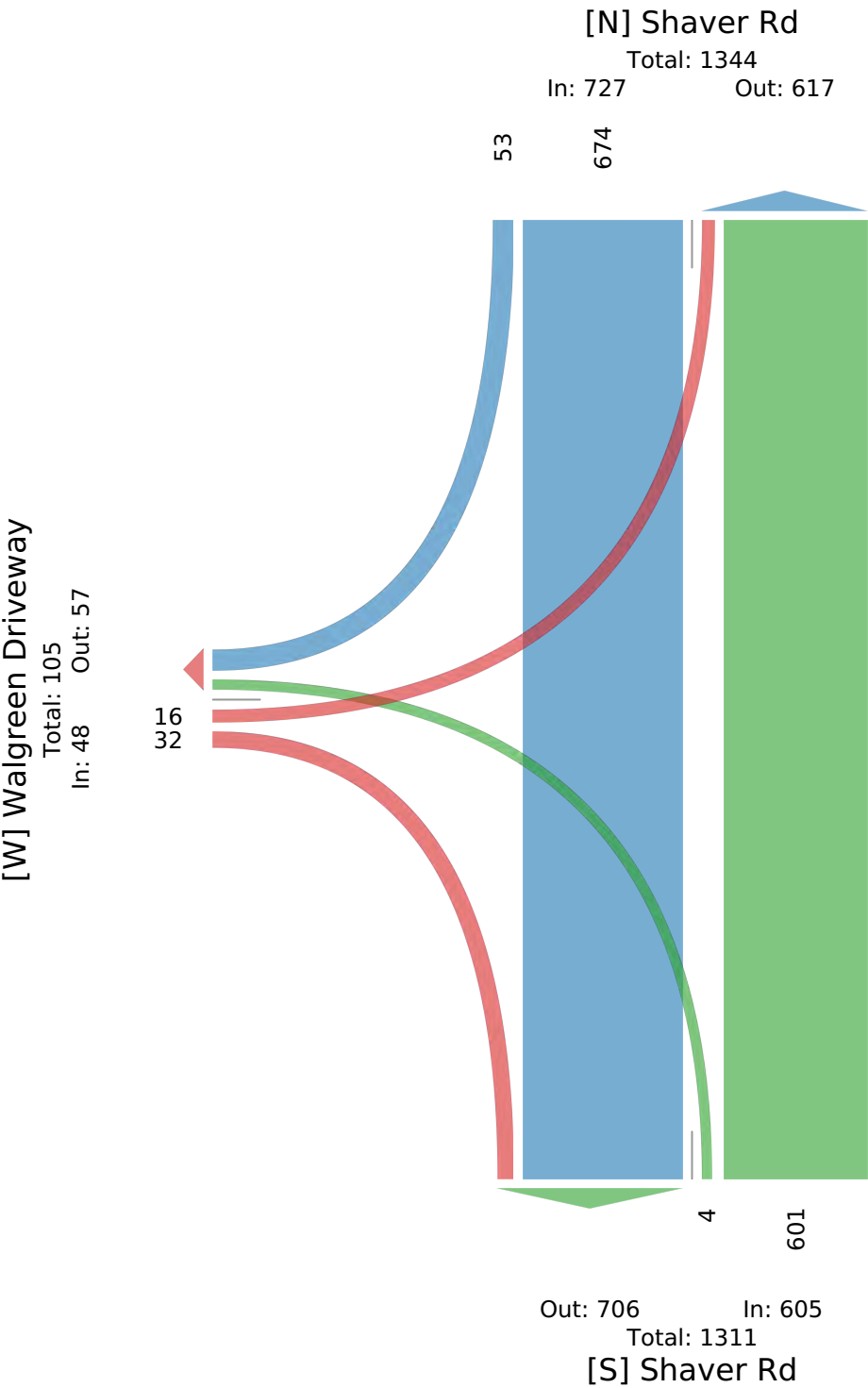
Leg Direction	Shaver Rd Southbound				Shaver Rd Northbound				Walgreen Driveway Eastbound				
Time	R	T	U	App	T	L	U	App	R	L	U	App	Int
2022-12-06 4:00PM	17	208	0	225	161	2	0	163	5	6	0	11	399
4:15PM	18	167	0	185	146	1	0	147	13	3	0	16	348
4:30PM	10	149	0	159	149	0	0	149	8	3	0	11	319
4:45PM	8	150	0	158	145	1	0	146	6	4	0	10	314
Total	53	674	0	727	601	4	0	605	32	16	0	48	1380
% Approach	7.3%	92.7%	0%	-	99.3%	0.7%	0%	-	66.7%	33.3%	0%	-	-
% Total	3.8%	48.8%	0%	52.7%	43.6%	0.3%	0%	43.8%	2.3%	1.2%	0%	3.5%	-
PHF	0.736	0.810	-	0.808	0.933	0.500	-	0.928	0.615	0.667	-	0.750	0.865
Lights and Motorcycles	53	668	0	721	599	4	0	603	32	15	0	47	1371
% Lights and Motorcycles	100%	99.1%	0%	99.2%	99.7%	100%	0%	99.7%	100%	93.8%	0%	97.9%	99.3%
Heavy	0	6	0	6	2	0	0	2	0	1	0	1	9
% Heavy	0%	0.9%	0%	0.8%	0.3%	0%	0%	0.3%	0%	6.3%	0%	2.1%	0.7%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC

Tue Dec 6, 2022
PM Peak (4 PM - 5 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023346, Location: 42.201791, -85.591176

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US



Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Huntington Driveway Southbound				Centre Ave Westbound				Centre Ave Eastbound				
Time	R	L	U	App	R	T	U	App	T	L	U	App	Int
2022-12-08 7:00AM	3	0	0	3	1	121	0	122	172	2	1	175	300
7:15AM	2	0	0	2	1	197	0	198	316	2	1	319	519
7:30AM	2	1	0	3	4	245	0	249	202	3	0	205	457
7:45AM	4	0	0	4	2	165	0	167	226	4	0	230	401
Hourly Total	11	1	0	12	8	728	0	736	916	11	2	929	1677
8:00AM	5	0	0	5	5	147	0	152	177	4	0	181	338
8:15AM	5	3	0	8	10	160	0	170	157	3	0	160	338
8:30AM	7	4	0	11	7	166	0	173	140	7	0	147	331
8:45AM	11	2	0	13	13	173	0	186	190	15	0	205	404
Hourly Total	28	9	0	37	35	646	0	681	664	29	0	693	1411
4:00PM	10	10	0	20	7	270	0	277	253	13	1	267	564
4:15PM	15	5	0	20	2	244	0	246	241	17	0	258	524
4:30PM	14	6	0	20	4	262	0	266	234	8	2	244	530
4:45PM	11	8	0	19	3	224	0	227	252	15	0	267	513
Hourly Total	50	29	0	79	16	1000	0	1016	980	53	3	1036	2131
5:00PM	21	8	0	29	10	271	0	281	277	13	0	290	600
5:15PM	9	6	0	15	13	275	0	288	283	9	0	292	595
5:30PM	19	8	0	27	11	228	0	239	218	11	0	229	495
5:45PM	14	10	0	24	11	192	0	203	205	8	0	213	440
Hourly Total	63	32	0	95	45	966	0	1011	983	41	0	1024	2130
Total	152	71	0	223	104	3340	0	3444	3543	134	5	3682	7349
% Approach	68.2%	31.8%	0%	-	3.0%	97.0%	0%	-	96.2%	3.6%	0.1%	-	-
% Total	2.1%	1.0%	0%	3.0%	1.4%	45.4%	0%	46.9%	48.2%	1.8%	0.1%	50.1%	-
Lights and Motorcycles	149	71	0	220	102	3279	0	3381	3472	133	5	3610	7211
% Lights and Motorcycles	98.0%	100%	0%	98.7%	98.1%	98.2%	0%	98.2%	98.0%	99.3%	100%	98.0%	98.1%
Heavy	3	0	0	3	2	61	0	63	71	1	0	72	138
% Heavy	2.0%	0%	0%	1.3%	1.9%	1.8%	0%	1.8%	2.0%	0.7%	0%	2.0%	1.9%

* L: Left, R: Right, T: Thru, U: U-Turn

Portage Creek Dev TIS - TMC
Thu Dec 8, 2022
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy)
All Movements
ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

[N] Huntington Driveway

Total: 461
In: 223 Out: 238

152
71

[W] Centre Ave
Total: 7179
In: 3682 Out: 3497

5
134
3543

104
3340

Out: 3614 In: 3444
Total: 7058
[E] Centre Ave

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Huntington Driveway Southbound				Centre Ave Westbound				Centre Ave Eastbound				
Time	R	L	U	App	R	T	U	App	T	L	U	App	Int
2022-12-08 7:15AM	2	0	0	2	1	197	0	198	316	2	1	319	519
7:30AM	2	1	0	3	4	245	0	249	202	3	0	205	457
7:45AM	4	0	0	4	2	165	0	167	226	4	0	230	401
8:00AM	5	0	0	5	5	147	0	152	177	4	0	181	338
Total	13	1	0	14	12	754	0	766	921	13	1	935	1715
% Approach	92.9%	7.1%	0%	-	1.6%	98.4%	0%	-	98.5%	1.4%	0.1%	-	-
% Total	0.8%	0.1%	0%	0.8%	0.7%	44.0%	0%	44.7%	53.7%	0.8%	0.1%	54.5%	-
PHF	0.650	0.250	-	0.700	0.600	0.769	-	0.769	0.729	0.813	0.250	0.733	0.826
Lights and Motorcycles	12	1	0	13	12	727	0	739	907	12	1	920	1672
% Lights and Motorcycles	92.3%	100%	0%	92.9%	100%	96.4%	0%	96.5%	98.5%	92.3%	100%	98.4%	97.5%
Heavy	1	0	0	1	0	27	0	27	14	1	0	15	43
% Heavy	7.7%	0%	0%	7.1%	0%	3.6%	0%	3.5%	1.5%	7.7%	0%	1.6%	2.5%

* L: Left, R: Right, T: Thru, U: U-Turn

[N] Huntington Driveway

Total: 39
In: 14 Out: 25

13
1

[W] Centre Ave

Total: 1703
In: 935 Out: 768

13
1

921

12

754

Out: 922 In: 766

Total: 1688

[E] Centre Ave

Portage Creek Dev TIS - TMC

Thu Dec 8, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

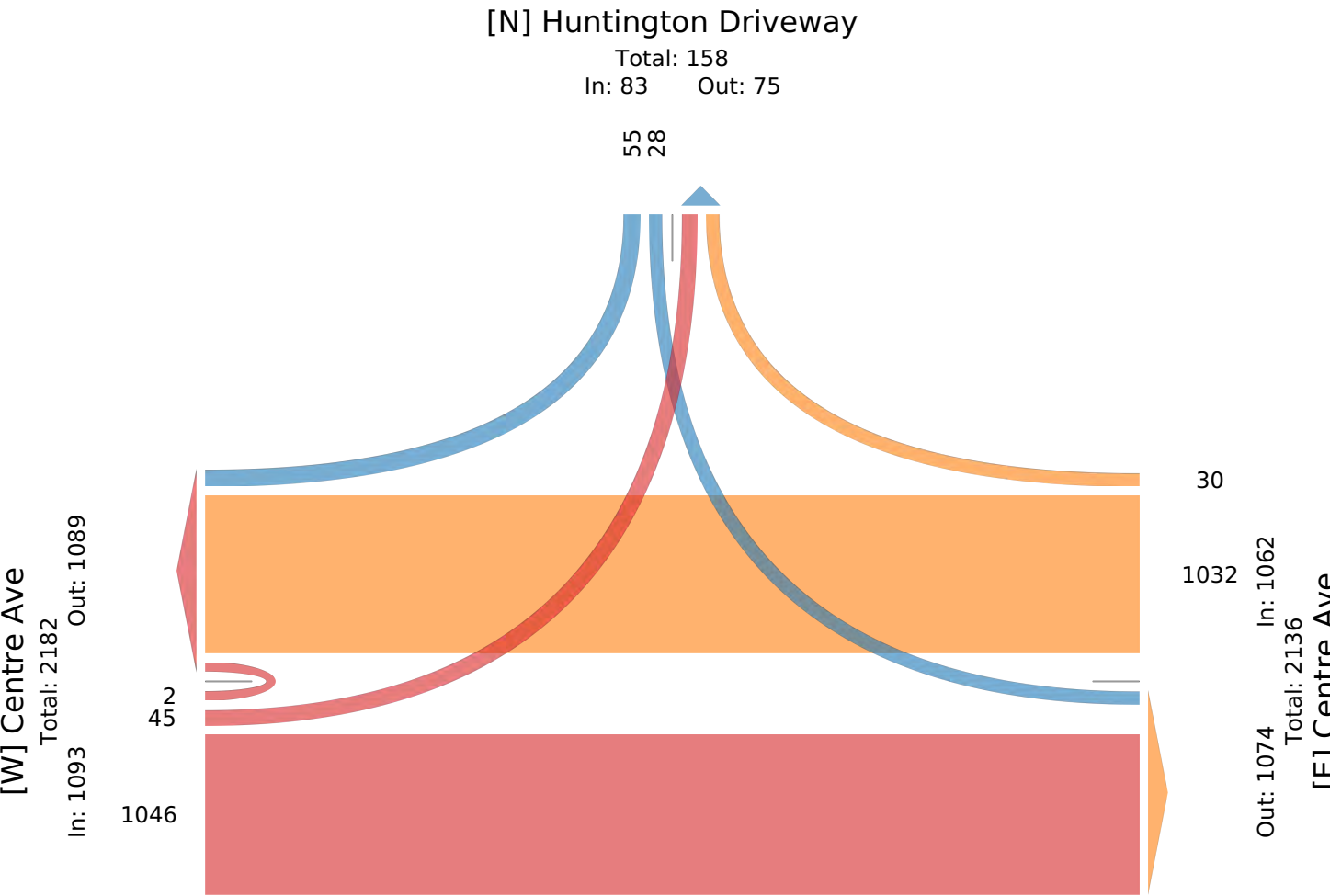
All Movements

ID: 1023351, Location: 42.201003, -85.592773

Provided by: RS Engineering LLC
6709 Centurion Drive Suite 300, Lansing, MI, 48917, US

Leg Direction	Huntington Driveway Southbound				Centre Ave Westbound				Centre Ave Eastbound				
Time	R	L	U	App	R	T	U	App	T	L	U	App	Int
2022-12-08 4:30PM	14	6	0	20	4	262	0	266	234	8	2	244	530
4:45PM	11	8	0	19	3	224	0	227	252	15	0	267	513
5:00PM	21	8	0	29	10	271	0	281	277	13	0	290	600
5:15PM	9	6	0	15	13	275	0	288	283	9	0	292	595
Total	55	28	0	83	30	1032	0	1062	1046	45	2	1093	2238
% Approach	66.3%	33.7%	0%	-	2.8%	97.2%	0%	-	95.7%	4.1%	0.2%	-	-
% Total	2.5%	1.3%	0%	3.7%	1.3%	46.1%	0%	47.5%	46.7%	2.0%	0.1%	48.8%	-
PHF	0.655	0.875	-	0.716	0.577	0.938	-	0.922	0.924	0.750	0.250	0.936	0.933
Lights and Motorcycles	54	28	0	82	29	1027	0	1056	1030	45	2	1077	2215
% Lights and Motorcycles	98.2%	100%	0%	98.8%	96.7%	99.5%	0%	99.4%	98.5%	100%	100%	98.5%	99.0%
Heavy	1	0	0	1	1	5	0	6	16	0	0	16	23
% Heavy	1.8%	0%	0%	1.2%	3.3%	0.5%	0%	0.6%	1.5%	0%	0%	1.5%	1.0%

* L: Left, R: Right, T: Thru, U: U-Turn



Appendix C

TRAFFIC ANALYSIS

Portage Creek Development Trip Generation (Trip Generation Manual 11th Edition)											
LUC	Description	Number	Unit	AM Peak				PM Peak			
				Equation	In	Out	Total	Equation	In	Out	Total
220	Multifamily Housing (Low-Rise)	228	Dwelling Unit	$T = 0.31(X) + 22.85$	23	71	94	$T = 0.43(X) + 20.55$	75	44	119
				Total	23	71	94	Total	75	44	119

ITE Trip Generation		AM Peak Hour Distribution											
Enter/Exit		Entering						Exiting					
Site Driveways		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use		Multifamily Housing (Low-Rise)											
Total Enter/Exit		23						71					
Internal Distribution % *		40%		40%		20%		40%		40%		20%	
Access Point Distribution % **		45%	55%	46%	54%	46%	54%	45%	55%	46%	54%	46%	54%
Access Point Volumes		4	5	4	5	2	3	13	15	13	15	7	8
All Land Uses Total		4	5	4	5	2	3	13	15	13	15	7	8

ITE Trip Generation		PM Peak Hour Distribution											
Enter/Exit		Entering						Exiting					
Site Driveways		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway		W. Centre Ave at Site Driveway		Shaver Rd at South Site Dr		Shaver Rd at North Site Driveway	
Direction		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Land Use		Multifamily Housing (Low-Rise)											
Total Enter/Exit		75						44					
Internal Distribution % *		40%		40%		20%		40%		40%		20%	
Access Point Distribution % **		49%	51%	55%	45%	55%	45%	48%	51%	55%	45%	55%	45%
Access Point Volumes		15	15	16	14	8	7	8	9	10	8	5	4
All Land Uses Total		15	15	16	14	8	7	8	9	10	8	5	4

*Internal Distribution: Assumed 40% of the traffic will be using the driveway on W Centre Ave, 40% using the Walgreens driveway on Shaver, and 20% using the north driveway on Shaver.

** The initial access point distribution is based on existing traffic on W. Centre Ave (Eastbound/Westbound) and Shaver Rd (Northbound/Southbound).

*** EB left and EB right at Centre/Shavers traffic is diverted to Shaver Rd North and South Site Dr. EB thru on Centre Ave continue to use Centre Ave Site Driveway exit left

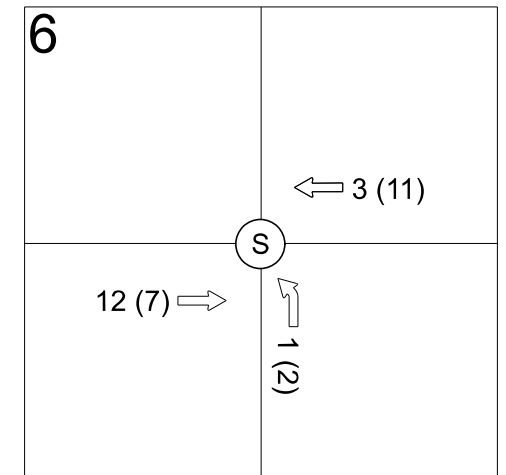
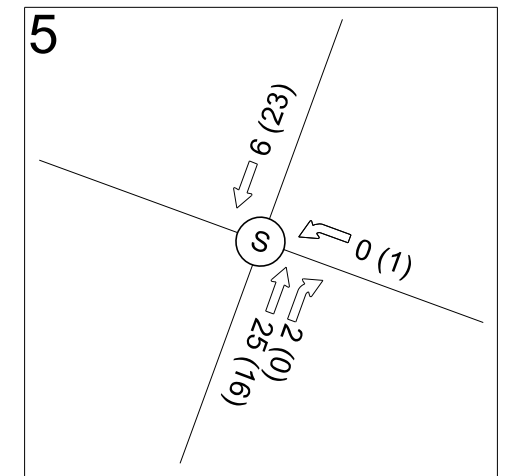
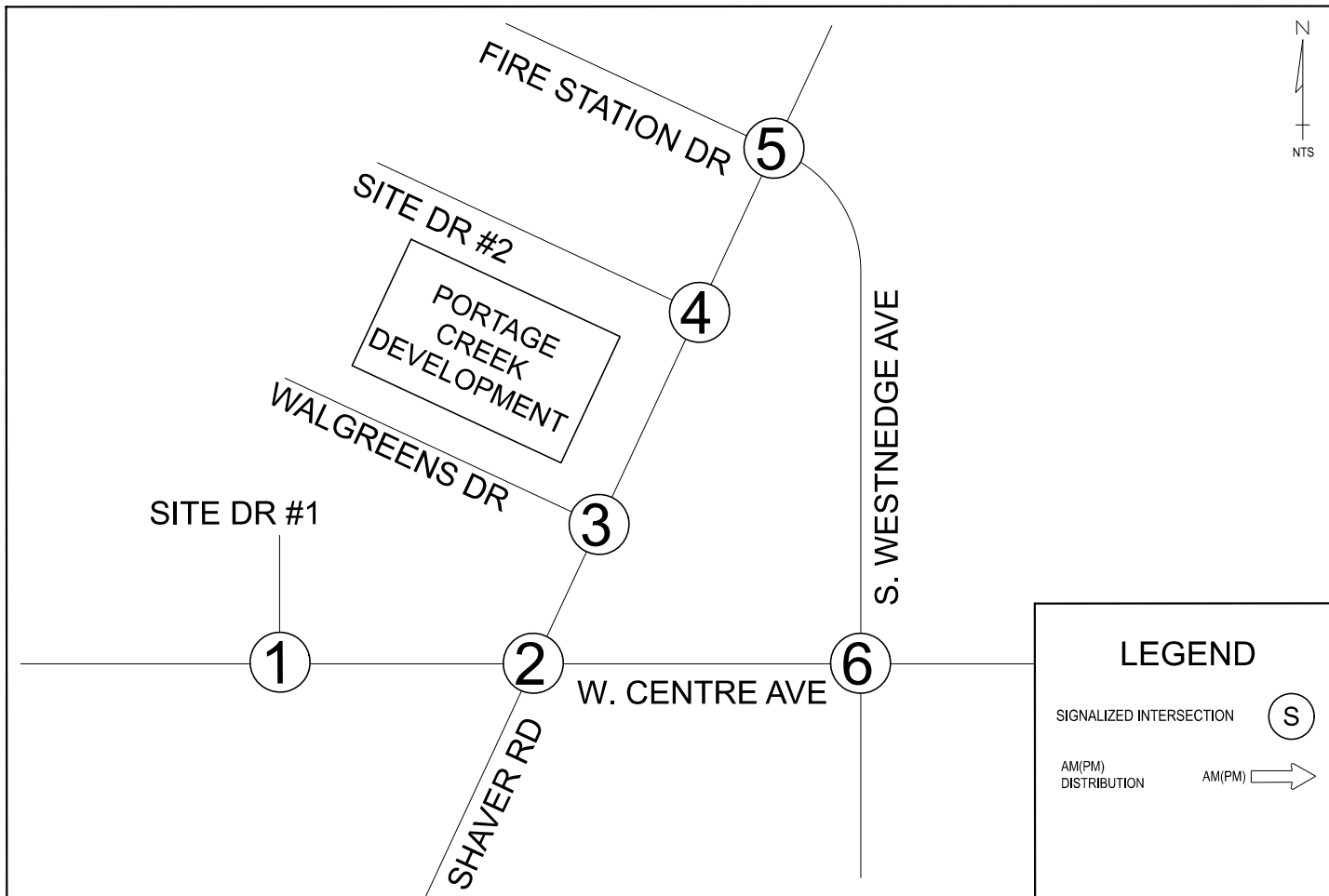
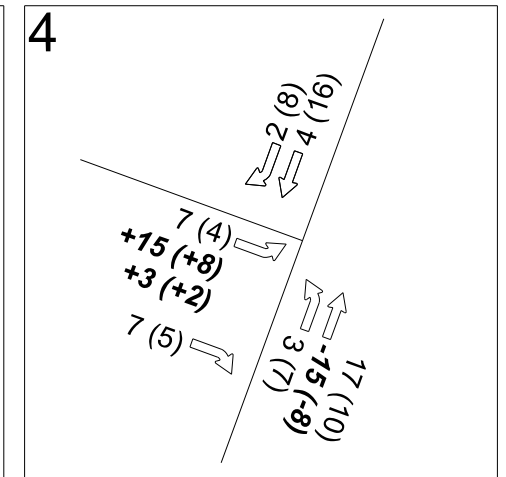
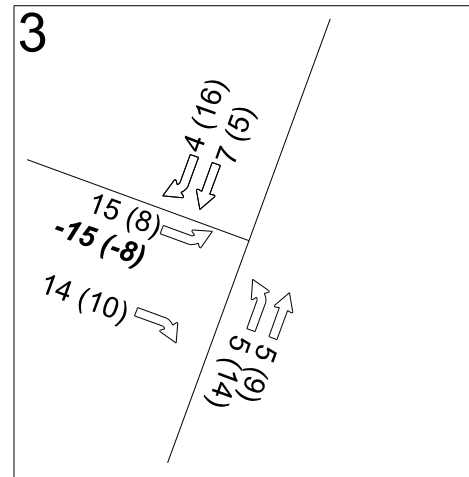
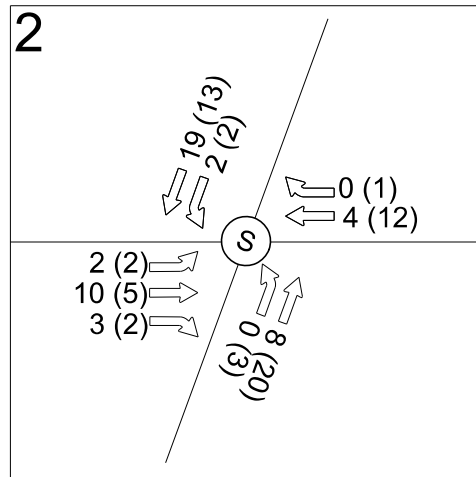
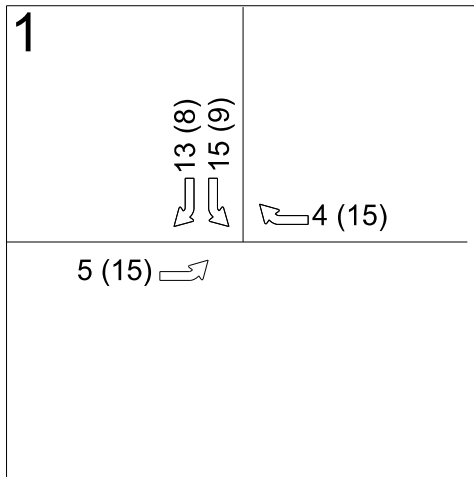
EXISTING VOLUME SPLITS (W. Centre Ave)				
			AM	PM
W. Centre Ave at Site Driveway	Eastbound	Left	13	45
		Thru	921	1046
	Westbound	Thru	754	1032
		Right	12	30
EXISTING VOLUME SPLITS (Shaver Rd)				
Shaver Rd at Walgreens Driveway	Northbound	Left	1	4
		Thru	347	601
	Southbound	Thru	274	674
		Right	18	53

Split for W. Centre Ave		
Direction	AM	PM
Eastbound	55%	51%
Westbound	45%	49%
TOTAL	100%	100%
Split for Shaver Rd		
Direction	AM	PM
Northbound	54%	45%
Southbound	46%	55%
TOTAL	100%	100%

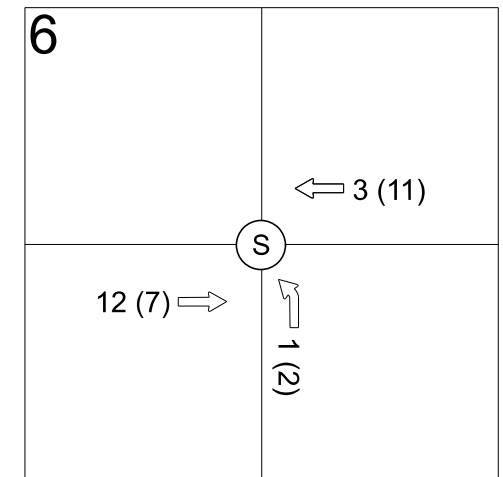
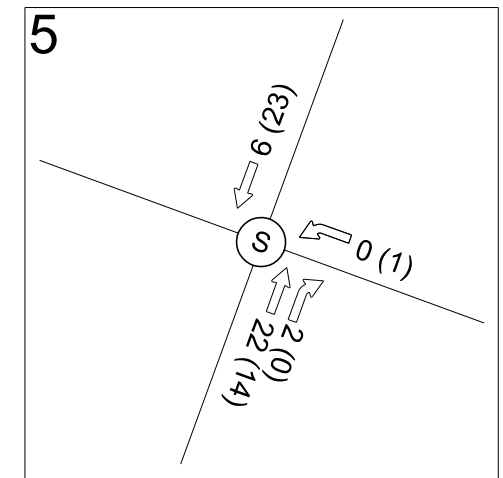
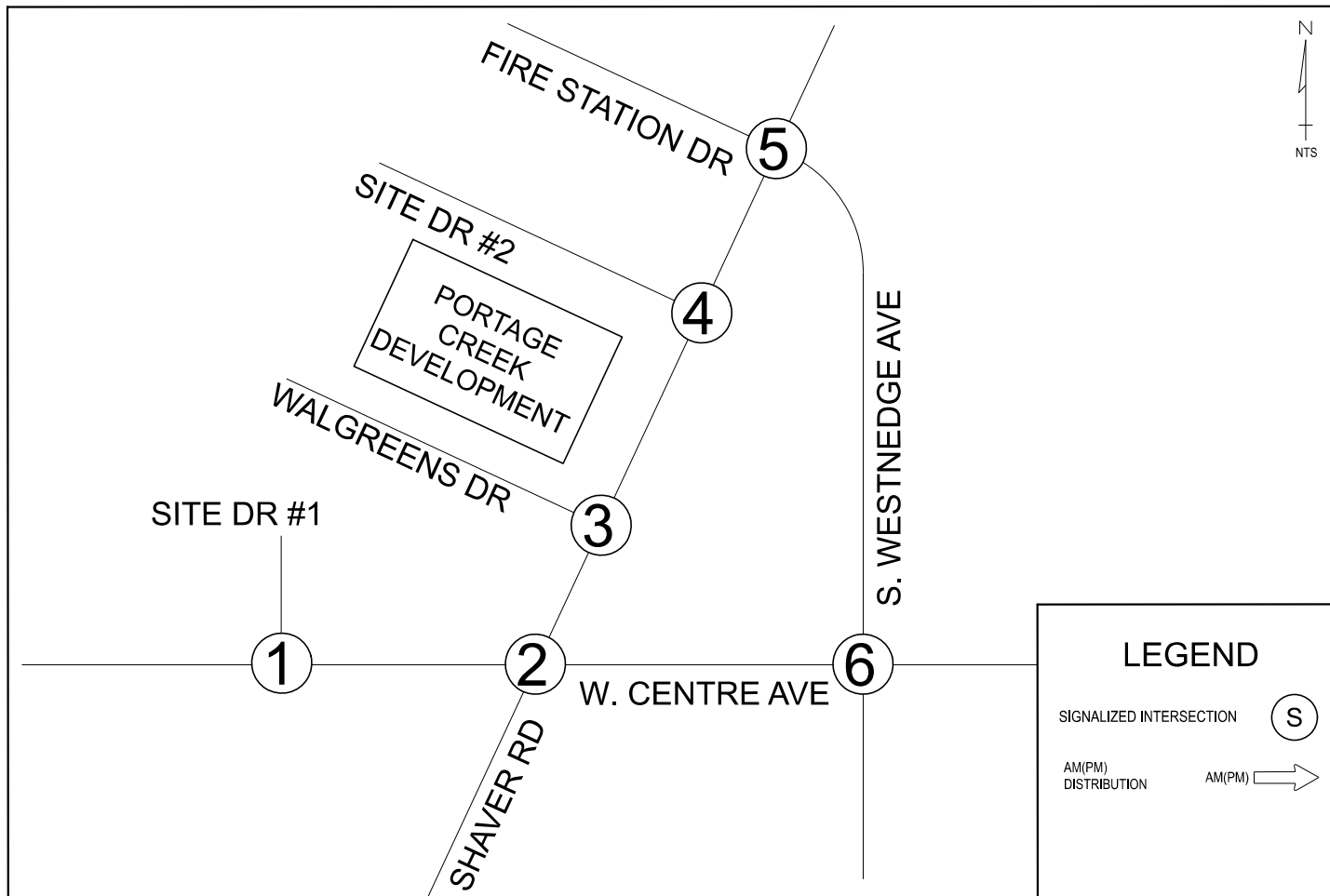
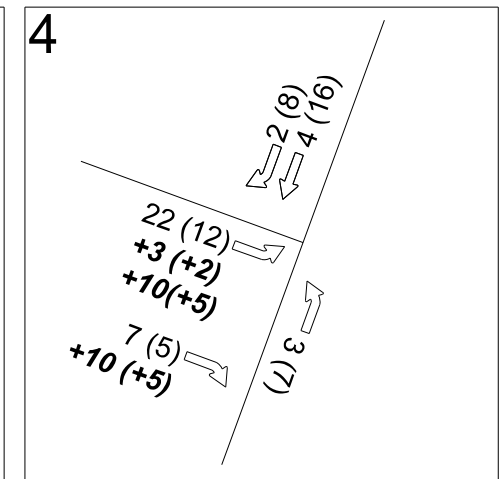
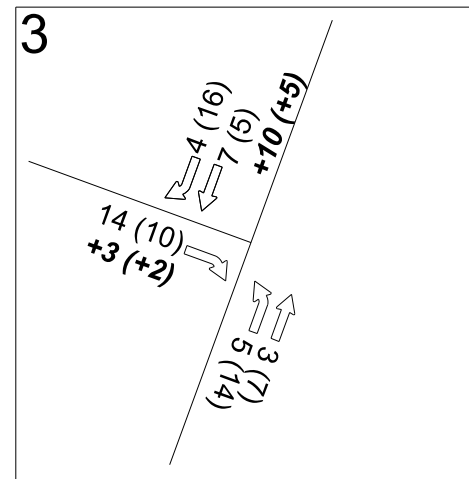
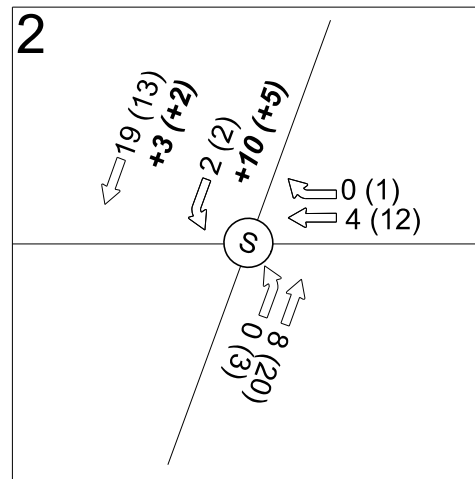
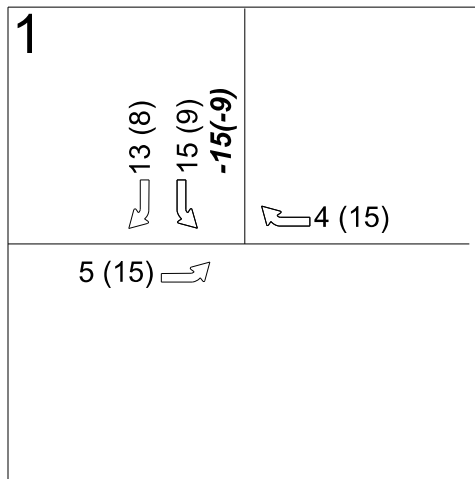
Trip distributions on W. Centre Rd and Shaver Rd

2022 Existing Traffic Volume									
Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count	
			AM Peak	PM Peak				AM Peak	PM Peak
W. Centre Ave at Shaver Rd	Eastbound	Left	86	190	Shaver Rd North Site Driveway	Eastbound	Left	0	0
		Thru	707	584			Right	2	5
		Right	131	218		Northbound	Left	8	22
	Westbound	Left	138	180			Thru	347	597
		Thru	636	768			Thru	290	722
		Right	12	25			Right	0	0
	Northbound	Left	89	182	Shaver Rd South Site Driveway	Eastbound	Left	8	16
		Thru	234	392			Right	8	32
		Right	103	214		Northbound	Left	1	4
	Southbound	Left	17	59			Thru	347	601
		Thru	173	507			Thru	274	674
		Right	69	130			Right	18	53
Shaver Rd at S. Westnedge	Eastbound	Left	1	6	W. Centre Ave Site Driveway	Eastbound	Left	13	53
		Thru	0	5			Thru	921	980
		Right	2	8		Westbound	Thru	754	1000
	Westbound	Left	5	13			Right	12	16
		Thru	3	5			Left	1	29
		Right	240	332			Right	13	50
	Northbound	Left	3	3	2022 Traffic Volumes				
		Thru	294	579					
		Right	31	15					
	Southbound	Left	229	309					
		Thru	263	701					
		Right	6	1					
W. Centre Ave at S. Westnedge	Eastbound	Left	12	26					
		Thru	706	708					
		Right	127	136					
	Westbound	Left	111	158					
		Thru	519	771					
		Right	52	112					
	Northbound	Left	174	117					
		Thru	153	143					
		Right	169	120					
Southbound	Left	107	115						
	Thru	116	159						
	Right	3	16						

2024 Existing Traffic Volume with 0.5% growth														
Intersection	Direction	Turning Movement	Hourly Count		Intersection	Direction	Turning Movement	Hourly Count						
			AM Peak	PM Peak				AM Peak	PM Peak					
W. Centre Ave at Shaver Rd	Eastbound	Left	87	192	Shaver Rd North Site Driveway	Eastbound	Left	0	0					
		Thru	715	590			Right	2	6					
		Right	133	221		Northbound	Left	8	23					
	Westbound	Left	140	182			Thru	352	603					
		Thru	643	776		Southbound	Thru	293	730					
		Right	13	26			Right	0	0					
	Northbound	Left	90	184	Shaver Rd South Site Driveway	Eastbound	Left	9	17					
		Thru	237	396			Right	9	33					
		Right	105	217		Northbound	Left	2	5					
	Southbound	Left	18	60			Thru	351	608					
		Thru	175	513		Southbound	Thru	277	681					
		Right	70	132			Right	19	54					
Shaver Rd at S. Westnedge	Eastbound	Left	2	7	W. Centre Ave Site Driveway	Eastbound	Left	14	54					
		Thru	0	6			Thru	931	990					
		Right	3	9		Westbound	Thru	762	1011					
	Westbound	Left	6	14			Right	13	17					
		Thru	4	6		Southbound	Left	2	30					
		Right	243	336			Right	14	51					
	Northbound	Left	4	4	Year 2024 Future Traffic Volumes (0.5% Growth)									
		Thru	297	585										
		Right	32	16										
	Southbound	Left	232	313										
		Thru	266	709										
		Right	7	2										
W. Centre Ave at S. Westnedge	Eastbound	Left	13	27						Year 2024 Future Traffic Volumes (0.5% Growth)				
		Thru	714	716										
		Right	129	138										
	Westbound	Left	113	160										
		Thru	525	779										
		Right	53	114										
	Northbound	Left	176	119										
		Thru	155	145										
		Right	171	122										
	Southbound	Left	109	117										
		Thru	118	161										
		Right	4	17										



TRIP GENERATION: SCENARIO #1



TRIP GENERATION: SCENARIO #2

Appendix D

SYNCHRO AND SIMTRAFFIC REPORTS

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

02/19/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	707	131	138	636	12	89	250	103	17	196	69
Future Volume (veh/h)	86	707	131	138	636	12	89	250	103	17	196	69
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	1870	1870	1870	1856	1856	1856	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	116	955	0	184	848	16	103	291	120	20	231	81
Peak Hour Factor	0.74	0.74	0.74	0.75	0.75	0.75	0.86	0.86	0.86	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	5	5	5	3	3	3
Cap, veh/h	380	1806		386	1807	34	227	392	158	168	322	110
Arrive On Green	0.07	0.51	0.00	0.02	0.17	0.17	0.07	0.16	0.16	0.03	0.12	0.12
Sat Flow, veh/h	1781	3554	1585	1767	3540	67	1739	2413	972	1767	2580	880
Grp Volume(v), veh/h	116	955	0	184	422	442	103	207	204	20	156	156
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1767	1763	1844	1739	1735	1651	1767	1763	1697
Q Serve(g_s), s	3.0	18.1	0.0	4.8	21.6	21.6	5.1	11.4	11.8	1.0	8.5	8.9
Cycle Q Clear(g_c), s	3.0	18.1	0.0	4.8	21.6	21.6	5.1	11.4	11.8	1.0	8.5	8.9
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.59	1.00		0.52
Lane Grp Cap(c), veh/h	380	1806		386	900	941	227	282	268	168	220	212
V/C Ratio(X)	0.31	0.53		0.48	0.47	0.47	0.45	0.74	0.76	0.12	0.71	0.74
Avail Cap(c_a), veh/h	430	1806		431	900	941	310	512	487	318	520	501
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	16.5	0.0	13.0	29.3	29.3	34.9	39.8	40.0	36.5	42.0	42.2
Incr Delay (d2), s/veh	0.4	1.1	0.0	0.9	1.8	1.7	1.4	3.7	4.4	0.3	4.2	4.9
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(50%),veh/ln	1.1	7.2	0.0	2.0	10.6	11.0	2.2	5.0	5.0	0.4	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	17.7	0.0	13.9	31.1	31.0	36.3	43.6	44.4	36.8	46.2	47.1
LnGrp LOS	B	B		B	C	C	D	D	D	D	D	D
Approach Vol, veh/h		1071			1048			514			332	
Approach Delay, s/veh		17.1			28.0			42.5			46.0	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	21.7	13.2	56.6	12.2	18.0	13.5	56.3				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	11.5	29.5	9.5	26.5	11.5	29.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	3.0	13.8	5.0	23.6	7.1	10.9	6.8	20.1				
Green Ext Time (p_c), s	0.0	2.1	0.1	1.4	0.1	1.6	0.1	3.3				
Intersection Summary												
HCM 6th Ctrl Delay			28.6									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

02/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	1	0	2	5	3	240	3	313	31	229	283	6
Future Volume (veh/h)	1	0	2	5	3	240	3	313	31	229	283	6
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	1411	1411	1411	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	1	0	3	7	4	329	3	337	33	283	349	7
Peak Hour Factor	0.75	0.75	0.75	0.73	0.73	0.73	0.93	0.93	0.93	0.81	0.81	0.81
Percent Heavy Veh, %	33	33	33	3	3	3	4	4	4	3	3	3
Cap, veh/h	263	0	258	285	149	373	589	1595	155	698	2093	42
Arrive On Green	0.24	0.00	0.24	0.24	0.24	0.24	0.01	0.50	0.50	0.10	0.59	0.59
Sat Flow, veh/h	775	0	1088	927	628	1572	1753	3220	313	1767	3535	71
Grp Volume(v), veh/h	1	0	3	11	0	329	3	182	188	283	174	182
Grp Sat Flow(s),veh/h/ln	775	0	1088	1556	0	1572	1753	1749	1784	1767	1763	1843
Q Serve(g_s), s	0.1	0.0	0.2	0.0	0.0	18.3	0.1	5.3	5.4	6.6	4.1	4.1
Cycle Q Clear(g_c), s	0.5	0.0	0.2	0.4	0.0	18.3	0.1	5.3	5.4	6.6	4.1	4.1
Prop In Lane	1.00		1.00	0.64		1.00	1.00		0.18	1.00		0.04
Lane Grp Cap(c), veh/h	263	0	258	434	0	373	589	866	884	698	1044	1091
V/C Ratio(X)	0.00	0.00	0.01	0.03	0.00	0.88	0.01	0.21	0.21	0.41	0.17	0.17
Avail Cap(c_a), veh/h	467	0	539	831	0	779	1061	866	884	1003	1044	1091
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	26.5	26.6	0.0	33.4	11.3	12.9	12.9	8.2	8.4	8.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.6	0.5	0.4	0.3	0.3
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(50%),veh/ln	0.0	0.0	0.1	0.2	0.0	7.6	0.0	2.1	2.2	2.2	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	0.0	26.5	26.6	0.0	40.4	11.3	13.5	13.5	8.6	8.7	8.7
LnGrp LOS	C	A	C	C	A	D	B	B	B	A	A	A
Approach Vol, veh/h		4			340			373			639	
Approach Delay, s/veh		26.6			39.9			13.5			8.7	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.3	50.0		26.5	5.5	58.8		26.5				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+1), s	19.6	7.4		20.3	2.1	6.1		2.5				
Green Ext Time (p_c), s	0.7	2.2		1.2	0.0	2.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

02/19/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	706	127	111	519	52	174	153	169	107	116	3
Future Volume (veh/h)	12	706	127	111	519	52	174	153	169	107	116	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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	13	743	134	117	546	55	249	219	241	157	171	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.70	0.70	0.70	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	4	4	4
Cap, veh/h	365	1038	187	258	1116	112	523	723	322	514	367	9
Arrive On Green	0.02	0.11	0.11	0.07	0.34	0.34	0.17	0.20	0.20	0.17	0.20	0.20
Sat Flow, veh/h	1781	3007	542	1767	3235	325	1767	3526	1572	1753	1791	42
Grp Volume(v), veh/h	13	439	438	117	297	304	249	219	241	157	0	175
Grp Sat Flow(s),veh/h/ln	1781	1777	1773	1767	1763	1797	1767	1763	1572	1753	0	1833
Q Serve(g_s), s	0.0	23.8	23.8	0.0	13.3	13.3	0.0	5.3	14.4	0.0	0.0	8.4
Cycle Q Clear(g_c), s	0.0	23.8	23.8	0.0	13.3	13.3	0.0	5.3	14.4	0.0	0.0	8.4
Prop In Lane	1.00		0.31	1.00		0.18	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	365	613	612	258	608	620	523	723	322	514	0	376
V/C Ratio(X)	0.04	0.72	0.72	0.45	0.49	0.49	0.48	0.30	0.75	0.31	0.00	0.47
Avail Cap(c_a), veh/h	396	613	612	289	608	620	523	723	322	514	0	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	39.6	39.6	40.5	25.8	25.8	30.7	33.7	37.3	27.5	0.0	34.9
Incr Delay (d2), s/veh	0.0	7.0	7.0	1.2	2.8	2.8	0.7	1.1	14.7	0.3	0.0	4.1
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(50%),veh/ln	0.2	12.5	12.4	2.8	5.8	6.0	5.1	2.3	6.8	3.0	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	46.6	46.6	41.7	28.6	28.6	31.4	34.8	52.0	27.8	0.0	39.0
LnGrp LOS	C	D	D	D	C	C	C	C	D	C	A	D
Approach Vol, veh/h	890			718			709			332		
Approach Delay, s/veh	46.3			30.7			39.4			33.7		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	40.0	22.8	25.0	12.2	40.0	22.8	25.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	34.5	34.5	15.5	20.5	8.5	34.5	15.5	20.5				
Max Q Clear Time (g_c+12, s)	25.8	25.8	2.0	16.4	2.0	15.3	2.0	10.4				
Green Ext Time (p_c), s	0.1	3.5	0.3	0.9	0.0	3.4	0.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

HCM Unsignalized Intersection Capacity Analysis

10: Shaver Rd/Shaver Rd (PB) & North Site Dr

02/19/2023

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	8	347	290	0
Future Volume (Veh/h)	0	2	8	347	290	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	9	377	315	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLT	TWLT	
Median storage veh				2	2	
Upstream signal (ft)				684	282	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	522	158	315			
vC1, stage 1 conf vol	315					
vC2, stage 2 conf vol	206					
vCu, unblocked vol	478	108	268			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	662	909	1270			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	2	9	188	188	210	105
Volume Left	0	9	0	0	0	0
Volume Right	2	0	0	0	0	0
cSH	909	1270	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.11	0.11	0.12	0.06
Queue Length 95th (ft)	0	1	0	0	0	0
Control Delay (s)	9.0	7.9	0.0	0.0	0.0	0.0
Lane LOS	A	A				
Approach Delay (s)	9.0	0.2			0.0	
Approach LOS	A					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			19.6%		ICU Level of Service	
Analysis Period (min)			15			
			A			

HCM 6th TWSC
10: Shaver Rd/Shaver Rd (PB) & North Site Dr

02/19/2023

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	8	347	290	0
Future Vol, veh/h	0	2	8	347	290	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	9	377	315	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	522	158	315	0	-	0
Stage 1	315	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	484	859	1242	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	481	859	1242	-	-	-
Mov Cap-2 Maneuver	561	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1242	-	859	-	-	
HCM Lane V/C Ratio	0.007	-	0.003	-	-	
HCM Control Delay (s)	7.9	-	9.2	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM Unsignalized Intersection Capacity Analysis

13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

02/19/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	8	8	1	347	274	18	
Future Volume (Veh/h)	8	8	1	347	274	18	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.60	0.60	0.94	0.94	0.87	0.87	
Hourly flow rate (vph)	13	13	1	369	315	21	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				TWLT	TWLT		
Median storage (veh)				2	2		
Upstream signal (ft)				308	658		
pX, platoon unblocked	0.97						
vC, conflicting volume	512	168	336				
vC1, stage 1 conf vol	326						
vC2, stage 2 conf vol	186						
vCu, unblocked vol	442	168	336				
tC, single (s)	6.8	6.9	4.2				
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2				
p0 queue free %	98	98	100				
cM capacity (veh/h)	669	853	1199				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	13	13	1	184	184	210	126
Volume Left	13	0	1	0	0	0	0
Volume Right	0	13	0	0	0	0	21
cSH	669	853	1199	1700	1700	1700	1700
Volume to Capacity	0.02	0.02	0.00	0.11	0.11	0.12	0.07
Queue Length 95th (ft)	1	1	0	0	0	0	0
Control Delay (s)	10.5	9.3	8.0	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.9		0.0	0.0			
Approach LOS	A						
Intersection Summary							
Average Delay			0.4				
Intersection Capacity Utilization			19.6%		ICU Level of Service		A
Analysis Period (min)			15				

HCM 6th TWSC
13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

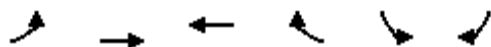
02/19/2023

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	8	1	347	274	18
Future Vol, veh/h	8	8	1	347	274	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	94	94	87	87
Heavy Vehicles, %	0	0	5	5	5	5
Mvmt Flow	13	13	1	369	315	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	513	168	336	0	-	0
Stage 1	326	-	-	-	-	-
Stage 2	187	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	496	853	1199	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	496	853	1199	-	-	-
Mov Cap-2 Maneuver	572	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1199	-	572	853	-	-
HCM Lane V/C Ratio	0.001	-	0.023	0.016	-	-
HCM Control Delay (s)	8	-	11.4	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

02/19/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Traffic Volume (veh/h)	13	923	782	12	1	13			
Future Volume (Veh/h)	13	923	782	12	1	13			
Sign Control		Free	Free		Stop				
Grade		0%	0%		0%				
Peak Hour Factor	1.00	1.00	0.77	0.77	0.70	0.70			
Hourly flow rate (vph)	13	923	1016	16	1	19			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None		TWLTL						
Median storage veh)			2						
Upstream signal (ft)			319						
pX, platoon unblocked	0.82				0.82	0.82			
vC, conflicting volume	1032				1281	516			
vC1, stage 1 conf vol					1024				
vC2, stage 2 conf vol					257				
vCu, unblocked vol	589				893	0			
tC, single (s)	4.1				6.9	7.0			
tC, 2 stage (s)					5.9				
tF (s)	2.2				3.6	3.4			
p0 queue free %	98				100	98			
cM capacity (veh/h)	802				388	872			
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2	
Volume Total	145	264	264	264	677	355	1	19	
Volume Left	13	0	0	0	0	0	1	0	
Volume Right	0	0	0	0	0	16	0	19	
cSH	802	1700	1700	1700	1700	1700	388	872	
Volume to Capacity	0.02	0.16	0.16	0.16	0.40	0.21	0.00	0.02	
Queue Length 95th (ft)	1	0	0	0	0	0	0	2	
Control Delay (s)	1.0	0.0	0.0	0.0	0.0	0.0	14.3	9.2	
Lane LOS	A							B	A
Approach Delay (s)	0.2				0.0			9.5	
Approach LOS								A	
Intersection Summary									
Average Delay			0.2						
Intersection Capacity Utilization			32.3%		ICU Level of Service			A	
Analysis Period (min)			15						

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	80	265	244	145	291	282	85	180	232	41	116	136
Average Queue (ft)	28	142	126	54	132	129	38	82	63	10	56	54
95th Queue (ft)	67	233	219	115	217	212	78	154	138	30	100	109
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		1	0		1	1						
Queuing Penalty (veh)		3	1		3	3						
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)					1							
Queuing Penalty (veh)					1							

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	TR	LT	R	T	TR	L	T	TR
Maximum Queue (ft)	54	30	139	132	154	137	86	64
Average Queue (ft)	3	5	71	47	50	56	22	11
95th Queue (ft)	21	24	119	101	118	106	59	38
Link Distance (ft)	457	484	484	207	207	868	868	868
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	299	311	135	170	154	124	226	194	125	202	226
Average Queue (ft)	15	195	203	59	96	52	84	39	66	55	78	68
95th Queue (ft)	71	266	275	110	160	107	132	135	134	109	145	157
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		2	2					1	1			
Queuing Penalty (veh)		9	9					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		15			0		13	0	3	0		
Queuing Penalty (veh)		2			0		12	0	6	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	28	28
Average Queue (ft)	1	2
95th Queue (ft)	9	14
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	31	31
Average Queue (ft)	7	8	1
95th Queue (ft)	28	31	10
Link Distance (ft)		222	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	75		50
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB
Directions Served	LT	R
Maximum Queue (ft)	31	50
Average Queue (ft)	8	16
95th Queue (ft)	31	43
Link Distance (ft)	80	370
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 51

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

02/03/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	584	218	180	768	25	182	392	214	59	517	130
Future Volume (veh/h)	190	584	218	180	768	25	182	392	214	59	517	130
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	200	615	0	189	808	26	219	472	258	70	615	155
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	336	1518		448	1524	49	199	540	294	187	629	158
Arrive On Green	0.07	0.43	0.00	0.02	0.14	0.14	0.07	0.24	0.24	0.05	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	1795	3542	114	1795	2240	1217	1795	2835	713
Grp Volume(v), veh/h	200	615	0	189	409	425	219	377	353	70	388	382
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1865	1795	1791	1666	1795	1791	1757
Q Serve(g_s), s	7.3	13.8	0.0	6.5	24.3	24.3	8.5	23.3	23.5	3.4	24.8	24.9
Cycle Q Clear(g_c), s	7.3	13.8	0.0	6.5	24.3	24.3	8.5	23.3	23.5	3.4	24.8	24.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.73	1.00		0.41
Lane Grp Cap(c), veh/h	336	1518		448	771	803	199	432	402	187	397	390
V/C Ratio(X)	0.60	0.41		0.42	0.53	0.53	1.10	0.87	0.88	0.37	0.98	0.98
Avail Cap(c_a), veh/h	336	1518		448	771	803	199	432	402	223	397	390
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	22.6	0.0	17.8	38.5	38.5	37.7	41.9	42.0	33.5	44.5	44.5
Incr Delay (d2), s/veh	2.8	0.8	0.0	0.6	2.6	2.5	92.8	17.4	19.3	1.2	39.1	40.2
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(50%),veh/ln	3.1	5.8	0.0	2.9	12.2	12.7	6.6	12.2	11.6	1.5	15.1	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	23.4	0.0	18.4	41.1	41.0	130.4	59.3	61.4	34.8	83.5	84.7
LnGrp LOS	C	C		B	D	D	F	E	E	C	F	F
Approach Vol, veh/h		815			1023			949			840	
Approach Delay, s/veh		23.2			36.9			76.5			80.0	
Approach LOS		C			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	33.2	15.0	55.0	14.0	31.0	15.0	55.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	8.5	25.5	8.5	49.5	8.5	25.5	8.5	49.5				
Max Q Clear Time (g_c+I1), s	5.4	25.5	9.3	26.3	10.5	26.9	8.5	15.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.3	0.0	0.0	0.0	4.5				
Intersection Summary												
HCM 6th Ctrl Delay			54.2									
HCM 6th LOS			D									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

02/03/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	6	5	8	13	5	332	3	579	15	309	701	1
Future Volume (veh/h)	6	5	8	13	5	332	3	579	15	309	701	1
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	10	8	13	15	6	395	3	616	16	347	788	1
Peak Hour Factor	0.60	0.60	0.60	0.84	0.84	0.84	0.94	0.94	0.94	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	250	191	364	349	130	437	396	1613	42	568	2100	3
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.45	0.45	0.13	0.57	0.57
Sat Flow, veh/h	706	704	1341	1057	479	1610	1795	3567	93	1795	3671	5
Grp Volume(v), veh/h	17	0	14	21	0	395	3	309	323	347	384	405
Grp Sat Flow(s),veh/h/ln	1264	0	1488	1536	0	1610	1795	1791	1869	1795	1791	1884
Q Serve(g_s), s	0.0	0.0	0.7	0.0	0.0	23.6	0.1	11.4	11.4	9.6	11.6	11.6
Cycle Q Clear(g_c), s	0.6	0.0	0.7	0.8	0.0	23.6	0.1	11.4	11.4	9.6	11.6	11.6
Prop In Lane	0.60		0.90	0.71		1.00	1.00		0.05	1.00		0.00
Lane Grp Cap(c), veh/h	401	0	404	479	0	437	396	810	845	568	1024	1078
V/C Ratio(X)	0.04	0.00	0.04	0.04	0.00	0.90	0.01	0.38	0.38	0.61	0.38	0.38
Avail Cap(c_a), veh/h	624	0	673	755	0	728	837	810	845	794	1024	1078
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	26.6	26.7	0.0	35.0	14.6	18.0	18.0	11.6	11.6	11.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	9.0	0.0	1.4	1.3	1.1	1.1	1.0
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(50%),veh/ln	0.3	0.0	0.3	0.4	0.0	10.2	0.0	4.8	5.0	3.6	4.6	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	26.7	26.7	0.0	44.0	14.6	19.4	19.3	12.6	12.7	12.6
LnGrp LOS	C	A	C	C	A	D	B	B	B	B	B	B
Approach Vol, veh/h		31			416			635			1136	
Approach Delay, s/veh		26.7			43.1			19.3			12.6	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.5	50.0		32.0	5.6	61.9		32.0				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+1), s	11.6	13.4		25.6	2.1	13.6		2.7				
Green Ext Time (p_c), s	0.9	4.0		1.5	0.0	5.3		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			20.5									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

02/03/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	708	136	158	771	112	117	143	120	115	159	16
Future Volume (veh/h)	26	708	136	158	771	112	117	143	120	115	159	16
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	27	745	143	166	812	118	136	166	140	140	194	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	260	1099	211	253	1160	169	513	701	313	576	329	34
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2974	571	1795	3138	456	1795	3582	1598	1795	1681	173
Grp Volume(v), veh/h	27	445	443	166	463	467	136	166	140	140	0	214
Grp Sat Flow(s),veh/h/ln	1781	1777	1768	1795	1791	1803	1795	1791	1598	1795	0	1854
Q Serve(g_s), s	0.0	27.6	27.6	0.8	25.3	25.3	0.0	4.5	8.9	0.0	0.0	12.1
Cycle Q Clear(g_c), s	0.0	27.6	27.6	0.8	25.3	25.3	0.0	4.5	8.9	0.0	0.0	12.1
Prop In Lane	1.00		0.32	1.00		0.25	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	260	657	653	253	662	666	513	701	313	576	0	363
V/C Ratio(X)	0.10	0.68	0.68	0.66	0.70	0.70	0.26	0.24	0.45	0.24	0.00	0.59
Avail Cap(c_a), veh/h	424	657	653	418	662	666	513	701	313	576	0	363
HCM Platoon Ratio	0.33	0.33	0.33	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.3	43.9	43.9	47.1	30.8	30.8	33.5	39.0	40.8	28.1	0.0	42.1
Incr Delay (d2), s/veh	0.2	5.6	5.6	2.9	6.1	6.0	0.3	0.8	4.6	0.2	0.0	6.9
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(50%),veh/ln	0.7	14.1	14.1	4.7	11.7	11.8	3.1	2.1	3.9	2.9	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	49.5	49.5	50.0	36.9	36.9	33.8	39.8	45.4	28.3	0.0	48.9
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	A	D
Approach Vol, veh/h	915			1096			442			354		
Approach Delay, s/veh	49.2			38.9			39.7			40.8		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	48.0	27.5	27.0	12.5	48.0	27.5	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	47.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+1.2), s	12.8	29.6	2.0	10.9	2.0	27.3	2.0	14.1				
Green Ext Time (p_c), s	0.4	4.6	0.2	1.1	0.0	5.2	0.2	0.7				

Intersection Summary

HCM 6th Ctrl Delay	42.6
HCM 6th LOS	D

HCM 6th TWSC
10: Shaver Rd/Shaver Rd (PB) & North Site Dr

02/03/2023

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	22	597	722	0
Future Vol, veh/h	0	5	22	597	722	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	24	649	785	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1158	393	785	0	-	0
Stage 1	785	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	189	606	829	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	184	606	829	-	-	-
Mov Cap-2 Maneuver	303	-	-	-	-	-
Stage 1	398	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	829	-	606	-	-	
HCM Lane V/C Ratio	0.029	-	0.009	-	-	
HCM Control Delay (s)	9.5	-	11	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0	-	-	

HCM 6th TWSC
13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

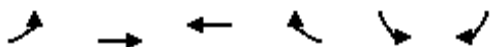
02/03/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	32	4	603	674	53
Future Vol, veh/h	16	32	4	603	674	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	21	43	4	648	832	65
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1197	449	897	0	-	0
Stage 1	865	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	179	557	765	-	-	-
Stage 1	373	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	178	557	765	-	-	-
Mov Cap-2 Maneuver	291	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	765	-	291	557	-	-
HCM Lane V/C Ratio	0.006	-	0.073	0.077	-	-
HCM Control Delay (s)	9.7	-	18.3	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.2	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

02/03/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Traffic Volume (veh/h)	53	963	1064	16	29	50			
Future Volume (Veh/h)	53	963	1064	16	29	50			
Sign Control		Free	Free		Stop				
Grade		0%	0%		0%				
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95			
Hourly flow rate (vph)	56	1014	1157	17	31	53			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None		TWLTL						
Median storage veh				2					
Upstream signal (ft)				319					
pX, platoon unblocked	0.82				0.82	0.82			
vC, conflicting volume	1174				1531	587			
vC1, stage 1 conf vol					1166				
vC2, stage 2 conf vol					366				
vCu, unblocked vol	785				1218	73			
tC, single (s)	4.1				6.8	6.9			
tC, 2 stage (s)					5.8				
tF (s)	2.2				3.5	3.3			
p0 queue free %	92				90	93			
cM capacity (veh/h)	684				312	806			
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2	
Volume Total	201	290	290	290	771	403	31	53	
Volume Left	56	0	0	0	0	0	31	0	
Volume Right	0	0	0	0	0	17	0	53	
cSH	684	1700	1700	1700	1700	1700	312	806	
Volume to Capacity	0.08	0.17	0.17	0.17	0.45	0.24	0.10	0.07	
Queue Length 95th (ft)	7	0	0	0	0	0	8	5	
Control Delay (s)	3.7	0.0	0.0	0.0	0.0	0.0	17.8	9.8	
Lane LOS	A							C	A
Approach Delay (s)	0.7				0.0				12.7
Approach LOS	B								
Intersection Summary									
Average Delay			0.8						
Intersection Capacity Utilization			58.0%		ICU Level of Service			B	
Analysis Period (min)			15						

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	189	284	273	220	293	293	236	289	326	175	291	292
Average Queue (ft)	84	155	129	124	213	209	133	133	154	73	213	218
95th Queue (ft)	146	225	205	228	294	289	226	220	259	195	321	322
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		1	1	0	7	9					18	16
Queuing Penalty (veh)		3	1	0	36	43					64	57
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	7			0		0	28	
Queuing Penalty (veh)				0	13			0		0	17	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	30	54	172	29	229	200	157	140	137
Average Queue (ft)	3	10	14	96	1	86	88	73	54	41
95th Queue (ft)	18	32	43	151	10	168	173	123	114	104
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)						0	0			
Queuing Penalty (veh)						2	0			
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						2				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	320	312	148	249	207	124	219	178	96	160	243
Average Queue (ft)	46	196	215	84	131	118	74	33	70	36	77	93
95th Queue (ft)	138	278	304	139	201	191	119	115	126	69	130	165
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		2	4					2	0			
Queuing Penalty (veh)		8	17					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)	0	9			3		6	0	2	0		
Queuing Penalty (veh)	0	2			5		5	0	3	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	30	53
Average Queue (ft)	6	10
95th Queue (ft)	26	38
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	50	74	30	87	137
Average Queue (ft)	12	24	1	15	9
95th Queue (ft)	37	58	10	58	56
Link Distance (ft)		222		322	322
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)		1	0		
Queuing Penalty (veh)		0	0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	119	92	74
Average Queue (ft)	34	31	35
95th Queue (ft)	94	68	56
Link Distance (ft)	80		370
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 276

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
No Build 2024 AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	715	133	140	643	13	90	253	105	18	198	70
Future Volume (veh/h)	87	715	133	140	643	13	90	253	105	18	198	70
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	1870	1870	1870	1856	1856	1856	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	118	966	0	187	857	17	105	294	122	21	233	82
Peak Hour Factor	0.74	0.74	0.74	0.75	0.75	0.75	0.86	0.86	0.86	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	5	5	5	3	3	3
Cap, veh/h	375	1798		381	1797	36	229	394	160	169	324	111
Arrive On Green	0.07	0.51	0.00	0.02	0.17	0.17	0.07	0.16	0.16	0.03	0.13	0.13
Sat Flow, veh/h	1781	3554	1585	1767	3536	70	1739	2408	977	1767	2577	883
Grp Volume(v), veh/h	118	966	0	187	427	447	105	210	206	21	157	158
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1767	1763	1843	1739	1735	1650	1767	1763	1697
Q Serve(g_s), s	3.0	18.4	0.0	4.9	21.9	21.9	5.2	11.5	11.9	1.0	8.6	9.0
Cycle Q Clear(g_c), s	3.0	18.4	0.0	4.9	21.9	21.9	5.2	11.5	11.9	1.0	8.6	9.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.59	1.00		0.52
Lane Grp Cap(c), veh/h	375	1798		381	896	937	229	283	270	169	222	214
V/C Ratio(X)	0.31	0.54		0.49	0.48	0.48	0.46	0.74	0.76	0.12	0.71	0.74
Avail Cap(c_a), veh/h	425	1798		425	896	937	310	512	487	318	520	501
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.6	16.8	0.0	13.3	29.6	29.6	34.8	39.8	40.0	36.3	42.0	42.1
Incr Delay (d2), s/veh	0.5	1.2	0.0	1.0	1.8	1.7	1.4	3.8	4.5	0.3	4.1	4.9
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(50%),veh/ln	1.2	7.3	0.0	2.0	10.7	11.2	2.2	5.1	5.1	0.4	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	17.9	0.0	14.2	31.4	31.3	36.2	43.6	44.5	36.6	46.1	47.0
LnGrp LOS	B	B		B	C	C	D	D	D	D	D	D
Approach Vol, veh/h	1084		1061				521		336			
Approach Delay, s/veh	17.4		28.3				42.5		46.0			
Approach LOS	B		C				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	21.8	13.2	56.3	12.3	18.1	13.5	56.1				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	11.5	29.5	9.5	26.5	11.5	29.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	3.0	13.9	5.0	23.9	7.2	11.0	6.9	20.4				
Green Ext Time (p_c), s	0.0	2.1	0.1	1.3	0.1	1.6	0.1	3.2				
Intersection Summary												
HCM 6th Ctrl Delay	28.8											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	3	6	4	243	4	316	32	232	284	7
Future Volume (veh/h)	2	0	3	6	4	243	4	316	32	232	284	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	1411	1411	1411	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	3	0	4	8	5	333	4	340	34	286	351	9
Peak Hour Factor	0.75	0.75	0.75	0.73	0.73	0.73	0.93	0.93	0.93	0.81	0.81	0.81
Percent Heavy Veh, %	33	33	33	3	3	3	4	4	4	3	3	3
Cap, veh/h	263	0	261	279	160	377	587	1582	157	694	2068	53
Arrive On Green	0.24	0.00	0.24	0.24	0.24	0.24	0.01	0.49	0.49	0.10	0.59	0.59
Sat Flow, veh/h	769	0	1088	898	667	1572	1753	3213	319	1767	3512	90
Grp Volume(v), veh/h	3	0	4	13	0	333	4	184	190	286	176	184
Grp Sat Flow(s),veh/h/ln	769	0	1088	1565	0	1572	1753	1749	1783	1767	1763	1839
Q Serve(g_s), s	0.3	0.0	0.3	0.0	0.0	18.7	0.1	5.5	5.5	6.7	4.2	4.2
Cycle Q Clear(g_c), s	0.8	0.0	0.3	0.5	0.0	18.7	0.1	5.5	5.5	6.7	4.2	4.2
Prop In Lane	1.00		1.00	0.62		1.00	1.00		0.18	1.00		0.05
Lane Grp Cap(c), veh/h	263	0	261	439	0	377	587	861	878	694	1038	1083
V/C Ratio(X)	0.01	0.00	0.02	0.03	0.00	0.88	0.01	0.21	0.22	0.41	0.17	0.17
Avail Cap(c_a), veh/h	462	0	536	830	0	775	1054	861	878	995	1038	1083
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	26.5	26.6	0.0	33.5	11.5	13.1	13.2	8.4	8.6	8.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.6	0.6	0.4	0.4	0.3
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(50%),veh/ln	0.1	0.0	0.1	0.2	0.0	7.7	0.0	2.1	2.2	2.3	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	26.5	26.6	0.0	40.4	11.5	13.7	13.7	8.8	8.9	8.9
LnGrp LOS	C	A	C	C	A	D	B	B	B	A	A	A
Approach Vol, veh/h	7		346				378			646		
Approach Delay, s/veh	26.7		39.9				13.7			8.9		
Approach LOS	C		D				B			A		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	14.5	50.0	26.9		5.7	58.8	26.9					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	25.0	45.0	45.0		25.0	45.0	45.0					
Max Q Clear Time (g_c+1.7), s	19.7	7.5	20.7		2.1	6.2	2.8					
Green Ext Time (p_c), s	0.7	2.3	1.2		0.0	2.2	0.0					

Intersection Summary

HCM 6th Ctrl Delay 18.1
HCM 6th LOS B

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	714	129	113	525	53	176	155	171	109	118	4
Future Volume (veh/h)	13	714	129	113	525	53	176	155	171	109	118	4
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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	14	752	136	119	553	56	251	221	244	160	174	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.70	0.70	0.70	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	4	4	4
Cap, veh/h	362	1037	188	255	1115	113	518	723	322	513	363	13
Arrive On Green	0.02	0.11	0.11	0.07	0.34	0.34	0.17	0.20	0.20	0.17	0.20	0.20
Sat Flow, veh/h	1781	3006	543	1767	3233	327	1767	3526	1572	1753	1769	61
Grp Volume(v), veh/h	14	444	444	119	301	308	251	221	244	160	0	180
Grp Sat Flow(s),veh/h/ln	1781	1777	1773	1767	1763	1797	1767	1763	1572	1753	0	1830
Q Serve(g_s), s	0.0	24.2	24.2	0.0	13.5	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Cycle Q Clear(g_c), s	0.0	24.2	24.2	0.0	13.5	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Prop In Lane	1.00		0.31	1.00		0.18	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	362	613	612	255	608	620	518	723	322	513	0	375
V/C Ratio(X)	0.04	0.73	0.73	0.47	0.49	0.50	0.48	0.31	0.76	0.31	0.00	0.48
Avail Cap(c_a), veh/h	393	613	612	286	608	620	518	723	322	513	0	375
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	39.7	39.7	40.7	25.9	25.9	30.9	33.7	37.4	27.7	0.0	35.0
Incr Delay (d2), s/veh	0.0	7.3	7.3	1.3	2.9	2.8	0.7	1.1	15.3	0.3	0.0	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(50%),veh/ln	0.3	12.7	12.6	2.8	6.0	6.1	5.1	2.4	6.9	3.1	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	47.0	47.1	42.0	28.7	28.7	31.6	34.8	52.7	28.0	0.0	39.4
LnGrp LOS	C	D	D	D	C	C	C	C	D	C	A	D
Approach Vol, veh/h	902			728			716			340		
Approach Delay, s/veh	46.8			30.9			39.8			34.0		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	40.0	22.8	25.0	12.2	40.0	22.8	25.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	34.5	34.5	15.5	20.5	8.5	34.5	15.5	20.5				
Max Q Clear Time (g_c+12, s)	26.2	26.2	2.0	16.6	2.0	15.6	2.0	10.7				
Green Ext Time (p_c), s	0.1	3.5	0.3	0.9	0.0	3.5	0.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	39.0
HCM 6th LOS	D

HCM Unsignalized Intersection Capacity Analysis

10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	8	352	293	0
Future Volume (Veh/h)	0	2	8	352	293	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	9	383	318	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLT	TWLT	
Median storage (veh)				2	2	
Upstream signal (ft)				684	282	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	528	159	318			
vC1, stage 1 conf vol	318					
vC2, stage 2 conf vol	210					
vCu, unblocked vol	484	109	271			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	660	908	1267			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	2	9	192	192	212	106
Volume Left	0	9	0	0	0	0
Volume Right	2	0	0	0	0	0
cSH	908	1267	1700	1700	1700	1700
Volume to Capacity	0.00	0.01	0.11	0.11	0.12	0.06
Queue Length 95th (ft)	0	1	0	0	0	0
Control Delay (s)	9.0	7.9	0.0	0.0	0.0	0.0
Lane LOS	A	A				
Approach Delay (s)	9.0	0.2			0.0	
Approach LOS	A					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			19.7%		ICU Level of Service	A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	8	352	293	0
Future Vol, veh/h	0	2	8	352	293	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	9	383	318	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	528	159	318	0	-	0
Stage 1	318	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	480	858	1239	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	477	858	1239	-	-	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1239	-	858	-	-	
HCM Lane V/C Ratio	0.007	-	0.003	-	-	
HCM Control Delay (s)	7.9	-	9.2	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM Unsignalized Intersection Capacity Analysis

13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Portage Creek TIS
No Build 2024 AM Peak



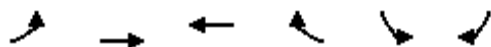
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	9	9	2	351	277	18	
Future Volume (Veh/h)	9	9	2	351	277	18	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.60	0.60	0.94	0.94	0.87	0.87	
Hourly flow rate (vph)	15	15	2	373	318	21	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				TWLT	TWLT		
Median storage veh)				2	2		
Upstream signal (ft)				308	658		
pX, platoon unblocked	0.98						
vC, conflicting volume	519	170	339				
vC1, stage 1 conf vol	328						
vC2, stage 2 conf vol	190						
vCu, unblocked vol	468	170	339				
tC, single (s)	6.8	6.9	4.2				
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	2.2				
p0 queue free %	98	98	100				
cM capacity (veh/h)	661	851	1196				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	15	2	186	186	212	127
Volume Left	15	0	2	0	0	0	0
Volume Right	0	15	0	0	0	0	21
cSH	661	851	1196	1700	1700	1700	1700
Volume to Capacity	0.02	0.02	0.00	0.11	0.11	0.12	0.07
Queue Length 95th (ft)	2	1	0	0	0	0	0
Control Delay (s)	10.6	9.3	8.0	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	9.9		0.0	0.0			
Approach LOS	A						
Intersection Summary							
Average Delay			0.4				
Intersection Capacity Utilization			19.7%		ICU Level of Service		A
Analysis Period (min)			15				

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	2	351	277	18
Future Vol, veh/h	9	9	2	351	277	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	94	94	87	87
Heavy Vehicles, %	0	0	5	5	5	5
Mvmt Flow	15	15	2	373	318	21
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	520	170	339	0	-	0
Stage 1	329	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.2	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.25	-	-	-
Pot Cap-1 Maneuver	491	851	1196	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	490	851	1196	-	-	-
Mov Cap-2 Maneuver	568	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1196	-	568	851	-	-
HCM Lane V/C Ratio	0.002	-	0.026	0.018	-	-
HCM Control Delay (s)	8	-	11.5	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
No Build 2024 AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑		↑	↑		
Traffic Volume (veh/h)	13	933	800	13	2	14		
Future Volume (Veh/h)	13	933	800	13	2	14		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	1.00	1.00	0.77	0.77	0.70	0.70		
Hourly flow rate (vph)	13	933	1039	17	3	20		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.81				0.81	0.81		
vC, conflicting volume	1056				1307	528		
vC1, stage 1 conf vol					1048			
vC2, stage 2 conf vol					259			
vCu, unblocked vol	607				915	0		
tC, single (s)	4.1				6.9	7.0		
tC, 2 stage (s)					5.9			
tF (s)	2.2				3.6	3.4		
p0 queue free %	98				99	98		
cM capacity (veh/h)	786				378	868		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	146	267	267	267	693	363	3	20
Volume Left	13	0	0	0	0	0	3	0
Volume Right	0	0	0	0	0	17	0	20
cSH	786	1700	1700	1700	1700	1700	378	868
Volume to Capacity	0.02	0.16	0.16	0.16	0.41	0.21	0.01	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	1	2
Control Delay (s)	1.0	0.0	0.0	0.0	0.0	0.0	14.6	9.2
Lane LOS	A						B	A
Approach Delay (s)	0.2				0.0		9.9	
Approach LOS							A	
Intersection Summary								
Average Delay			0.2					
Intersection Capacity Utilization			32.5%		ICU Level of Service			A
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	55	280	300	130	243	224	120	161	132	39	163	131
Average Queue (ft)	21	149	133	51	135	134	48	89	65	7	60	56
95th Queue (ft)	44	240	237	109	208	204	90	145	126	26	115	108
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		2	2		1	0						
Queuing Penalty (veh)		6	5		4	2						
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)					1						1	
Queuing Penalty (veh)					1						0	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	78	48	30	160	31	155	205	93	65	62
Average Queue (ft)	6	6	4	67	2	47	52	52	17	8
95th Queue (ft)	37	27	19	115	14	105	133	86	46	31
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)							0			
Queuing Penalty (veh)							0			
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						0				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	270	312	130	272	150	125	191	148	125	138	119
Average Queue (ft)	25	185	201	68	112	67	85	34	64	57	54	57
95th Queue (ft)	97	255	283	110	204	134	139	119	123	109	103	107
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		1	2					1				
Queuing Penalty (veh)		6	11					0				
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		12			1		13	0	1	1		
Queuing Penalty (veh)		2			2		10	0	3	1		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	31	30
Average Queue (ft)	2	1
95th Queue (ft)	14	10
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	31	30
Average Queue (ft)	2	6	1
95th Queue (ft)	14	27	10
Link Distance (ft)		222	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	75		50
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	EB	SB	SB
Directions Served	LT	T	L	R
Maximum Queue (ft)	74	22	30	71
Average Queue (ft)	7	1	1	16
95th Queue (ft)	36	7	10	46
Link Distance (ft)	80	80		370
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 51

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
No Build 2024 PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	590	221	182	776	26	184	396	217	60	522	132
Future Volume (veh/h)	192	590	221	182	776	26	184	396	217	60	522	132
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	202	621	0	192	817	27	222	477	261	71	621	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	333	1518		445	1523	50	197	540	294	185	628	159
Arrive On Green	0.07	0.43	0.00	0.02	0.14	0.14	0.07	0.24	0.24	0.05	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	1795	3538	117	1795	2239	1218	1795	2833	715
Grp Volume(v), veh/h	202	621	0	192	414	430	222	381	357	71	392	386
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1864	1795	1791	1666	1795	1791	1757
Q Serve(g_s), s	7.4	14.0	0.0	6.7	24.7	24.7	8.5	23.6	23.8	3.4	25.1	25.2
Cycle Q Clear(g_c), s	7.4	14.0	0.0	6.7	24.7	24.7	8.5	23.6	23.8	3.4	25.1	25.2
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.73	1.00		0.41
Lane Grp Cap(c), veh/h	333	1518		445	771	802	197	432	402	185	397	389
V/C Ratio(X)	0.61	0.41		0.43	0.54	0.54	1.13	0.88	0.89	0.38	0.99	0.99
Avail Cap(c_a), veh/h	333	1518		445	771	802	197	432	402	220	397	389
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	22.6	0.0	17.8	38.7	38.7	37.5	42.1	42.1	33.6	44.6	44.6
Incr Delay (d2), s/veh	3.1	0.8	0.0	0.7	2.7	2.6	101.9	18.9	20.9	1.3	41.8	42.9
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(50%),veh/ln	3.2	5.9	0.0	3.0	12.4	12.9	7.0	12.5	11.9	1.5	15.5	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	23.5	0.0	18.5	41.3	41.2	139.4	60.9	63.0	34.9	86.4	87.6
LnGrp LOS	C	C		B	D	D	F	E	E	C	F	F
Approach Vol, veh/h		823			1036			960			849	
Approach Delay, s/veh		23.3			37.1			79.8			82.6	
Approach LOS		C			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	33.2	15.0	55.0	14.0	31.0	15.0	55.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	8.5	25.5	8.5	49.5	8.5	25.5	8.5	49.5				
Max Q Clear Time (g_c+I1), s	5.4	25.8	9.4	26.7	10.5	27.2	8.7	16.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.4	0.0	0.0	0.0	4.6				

Intersection Summary

HCM 6th Ctrl Delay 55.7
HCM 6th LOS E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS
No Build 2024 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔	↔	↔	↔↔		↔	↔↔	
Traffic Volume (veh/h)	7	6	9	14	6	336	4	585	16	313	709	2
Future Volume (veh/h)	7	6	9	14	6	336	4	585	16	313	709	2
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	12	10	15	17	7	400	4	622	17	352	797	2
Peak Hour Factor	0.60	0.60	0.60	0.84	0.84	0.84	0.94	0.94	0.94	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	252	204	357	348	134	442	393	1598	44	564	2084	5
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.45	0.45	0.13	0.57	0.57
Sat Flow, veh/h	708	742	1300	1045	487	1610	1795	3561	97	1795	3665	9
Grp Volume(v), veh/h	20	0	17	24	0	400	4	313	326	352	389	410
Grp Sat Flow(s),veh/h/ln	1254	0	1495	1533	0	1610	1795	1791	1868	1795	1791	1884
Q Serve(g_s), s	0.0	0.0	0.8	0.1	0.0	24.1	0.1	11.7	11.7	9.9	12.0	12.0
Cycle Q Clear(g_c), s	0.8	0.0	0.8	1.0	0.0	24.1	0.1	11.7	11.7	9.9	12.0	12.0
Prop In Lane	0.61		0.87	0.71		1.00	1.00		0.05	1.00		0.00
Lane Grp Cap(c), veh/h	402	0	411	482	0	442	393	803	838	564	1018	1071
V/C Ratio(X)	0.05	0.00	0.04	0.05	0.00	0.90	0.01	0.39	0.39	0.62	0.38	0.38
Avail Cap(c_a), veh/h	615	0	671	747	0	722	827	803	838	783	1018	1071
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	26.7	26.7	0.0	35.1	14.9	18.5	18.5	11.9	11.9	11.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	9.5	0.0	1.4	1.4	1.1	1.1	1.0
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(50%),veh/ln	0.4	0.0	0.3	0.4	0.0	10.5	0.0	5.0	5.2	3.7	4.7	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	26.7	26.8	0.0	44.6	14.9	19.9	19.8	13.0	13.0	13.0
LnGrp LOS	C	A	C	C	A	D	B	B	B	B	B	B
Approach Vol, veh/h	37		424			643			1151			
Approach Delay, s/veh	26.7		43.6			19.8			13.0			
Approach LOS	C		D			B			B			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	17.8	50.0	32.5		5.7	62.0	32.5					
Change Period (Y+Rc), s	5.0	5.0	5.0		5.0	5.0	5.0					
Max Green Setting (Gmax), s	25.0	45.0	45.0		25.0	45.0	45.0					
Max Q Clear Time (g_c+1), s	11.9	13.7	26.1		2.1	14.0	2.8					
Green Ext Time (p_c), s	0.9	4.1	1.5		0.0	5.4	0.2					
Intersection Summary												
HCM 6th Ctrl Delay			20.9									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
No Build 2024 PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	716	138	160	779	114	119	145	122	117	161	17
Future Volume (veh/h)	27	716	138	160	779	114	119	145	122	117	161	17
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	28	754	145	168	820	120	138	169	142	143	196	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	258	1099	211	250	1159	170	511	701	313	574	327	35
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2973	572	1795	3135	459	1795	3582	1598	1795	1674	179
Grp Volume(v), veh/h	28	451	448	168	468	472	138	169	142	143	0	217
Grp Sat Flow(s),veh/h/ln	1781	1777	1767	1795	1791	1803	1795	1791	1598	1795	0	1853
Q Serve(g_s), s	0.0	27.9	28.0	1.1	25.7	25.7	0.0	4.6	9.0	0.0	0.0	12.3
Cycle Q Clear(g_c), s	0.0	27.9	28.0	1.1	25.7	25.7	0.0	4.6	9.0	0.0	0.0	12.3
Prop In Lane	1.00		0.32	1.00		0.25	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	258	657	653	250	662	666	511	701	313	574	0	363
V/C Ratio(X)	0.11	0.69	0.69	0.67	0.71	0.71	0.27	0.24	0.45	0.25	0.00	0.60
Avail Cap(c_a), veh/h	421	657	653	415	662	666	511	701	313	574	0	363
HCM Platoon Ratio	0.33	0.33	0.33	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.7	44.1	44.1	47.4	30.9	30.9	33.7	39.0	40.8	28.2	0.0	42.1
Incr Delay (d2), s/veh	0.2	5.8	5.8	3.1	6.3	6.2	0.3	0.8	4.7	0.2	0.0	7.1
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(50%),veh/ln	0.7	14.3	14.3	4.7	12.0	12.0	3.2	2.1	4.0	3.0	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	49.9	49.9	50.5	37.2	37.2	34.0	39.9	45.5	28.5	0.0	49.3
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	A	D
Approach Vol, veh/h	927			1108			449			360		
Approach Delay, s/veh	49.6			39.2			39.8			41.0		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	48.0	27.5	27.0	12.5	48.0	27.5	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	47.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+1.1s), s	13.1	30.0	2.0	11.0	2.0	27.7	2.0	14.3				
Green Ext Time (p_c), s	0.4	4.6	0.2	1.1	0.0	5.2	0.2	0.7				

Intersection Summary

HCM 6th Ctrl Delay	42.9
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	21	605	730	2
Future Vol, veh/h	0	5	21	605	730	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	23	658	793	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1169	398	795	0	-	0
Stage 1	794	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	186	601	822	-	-	-
Stage 1	406	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	181	601	822	-	-	-
Mov Cap-2 Maneuver	301	-	-	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	822	-	601	-	-	
HCM Lane V/C Ratio	0.028	-	0.009	-	-	
HCM Control Delay (s)	9.5	-	11	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0	-	-	

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	33	5	609	681	54
Future Vol, veh/h	17	33	5	609	681	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	23	44	5	655	841	67
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1213	454	908	0	-	0
Stage 1	875	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	174	553	758	-	-	-
Stage 1	368	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	173	553	758	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	365	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.3	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	758	-	286	553	-	-
HCM Lane V/C Ratio	0.007	-	0.079	0.08	-	-
HCM Control Delay (s)	9.8	-	18.7	12.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.3	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
No Build 2024 PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑↔		↔	↔		
Traffic Volume (veh/h)	54	973	1075	17	30	51		
Future Volume (Veh/h)	54	973	1075	17	30	51		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95		
Hourly flow rate (vph)	57	1024	1168	18	32	54		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.82				0.82	0.82		
vC, conflicting volume	1186				1547	593		
vC1, stage 1 conf vol					1177			
vC2, stage 2 conf vol					370			
vCu, unblocked vol	792				1231	70		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	92				90	93		
cM capacity (veh/h)	677				308	806		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	203	293	293	293	779	407	32	54
Volume Left	57	0	0	0	0	0	32	0
Volume Right	0	0	0	0	0	18	0	54
cSH	677	1700	1700	1700	1700	1700	308	806
Volume to Capacity	0.08	0.17	0.17	0.17	0.46	0.24	0.10	0.07
Queue Length 95th (ft)	7	0	0	0	0	0	9	5
Control Delay (s)	3.7	0.0	0.0	0.0	0.0	0.0	18.0	9.8
Lane LOS	A						C	A
Approach Delay (s)	0.7				0.0		12.9	
Approach LOS							B	
Intersection Summary								
Average Delay			0.8					
Intersection Capacity Utilization			58.5%		ICU Level of Service			B
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	247	292	269	220	293	293	300	538	519	174	290	292
Average Queue (ft)	103	132	120	133	232	229	229	258	244	60	175	174
95th Queue (ft)	181	196	192	233	308	301	331	543	496	162	296	289
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)	2	1	1	0	13	13		13	0		10	10
Queuing Penalty (veh)	4	3	2	0	64	66		0	0		41	43
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	13		26	0		0	18	
Queuing Penalty (veh)				1	24		57	0		0	12	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	50	49	51	206	32	204	223	172	152	122
Average Queue (ft)	9	12	16	94	4	95	106	83	57	38
95th Queue (ft)	34	37	43	169	22	177	203	146	116	84
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)						0	0			
Queuing Penalty (veh)						0	1			
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						3				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	305	312	200	282	239	121	105	204	125	180	186
Average Queue (ft)	37	192	207	129	172	131	73	18	82	60	73	95
95th Queue (ft)	106	292	296	214	282	236	122	67	158	121	132	169
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		4	4						0			
Queuing Penalty (veh)		16	19						0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)	0	11		1	9		7	0	6	0		
Queuing Penalty (veh)	0	3		2	14		6	0	7	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	30	31
Average Queue (ft)	2	7
95th Queue (ft)	14	28
Link Distance (ft)	507	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		125
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	72	54	31	181	197
Average Queue (ft)	18	23	2	13	15
95th Queue (ft)	51	49	15	83	94
Link Distance (ft)		222		322	322
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)	1		0		
Queuing Penalty (veh)	1		0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	WB	SB	SB
Directions Served	LT	T	L	R
Maximum Queue (ft)	93	33	70	53
Average Queue (ft)	28	1	25	27
95th Queue (ft)	74	11	60	49
Link Distance (ft)	80	210		370
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 386

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
Build Out 2024 _ Original AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	725	136	140	657	13	90	259	113	30	218	70
Future Volume (veh/h)	89	725	136	140	657	13	90	259	113	30	218	70
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	1870	1870	1870	1856	1856	1856	1826	1826	1826	1856	1856	1856
Adj Flow Rate, veh/h	120	980	0	187	876	17	105	301	131	35	256	82
Peak Hour Factor	0.74	0.74	0.74	0.75	0.75	0.75	0.86	0.86	0.86	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	3	3	3	5	5	5	3	3	3
Cap, veh/h	358	1737		366	1743	34	238	394	168	189	376	118
Arrive On Green	0.07	0.49	0.00	0.02	0.16	0.16	0.07	0.17	0.17	0.04	0.14	0.14
Sat Flow, veh/h	1781	3554	1585	1767	3537	69	1739	2371	1008	1767	2642	827
Grp Volume(v), veh/h	120	980	0	187	437	456	105	218	214	35	169	169
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1767	1763	1843	1739	1735	1644	1767	1763	1707
Q Serve(g_s), s	3.2	19.5	0.0	5.1	22.6	22.6	5.1	12.0	12.4	1.6	9.1	9.4
Cycle Q Clear(g_c), s	3.2	19.5	0.0	5.1	22.6	22.6	5.1	12.0	12.4	1.6	9.1	9.4
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.61	1.00		0.48
Lane Grp Cap(c), veh/h	358	1737		366	868	908	238	289	274	189	251	243
V/C Ratio(X)	0.33	0.56		0.51	0.50	0.50	0.44	0.76	0.78	0.19	0.67	0.70
Avail Cap(c_a), veh/h	407	1737		407	868	908	321	512	485	315	520	503
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	18.1	0.0	14.4	30.7	30.7	33.7	39.8	39.9	34.3	40.7	40.8
Incr Delay (d2), s/veh	0.5	1.3	0.0	1.1	2.1	2.0	1.3	4.0	4.8	0.5	3.1	3.6
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(50%),veh/ln	1.2	7.8	0.0	2.1	11.1	11.6	2.2	5.3	5.3	0.7	4.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	19.4	0.0	15.5	32.8	32.7	35.0	43.8	44.8	34.8	43.8	44.4
LnGrp LOS	B	B		B	C	C	C	D	D	C	D	D
Approach Vol, veh/h	1100			1080			537			373		
Approach Delay, s/veh	18.8			29.7			42.5			43.3		
Approach LOS	B			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	22.1	13.3	54.8	12.3	19.7	13.6	54.4				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	11.5	29.5	9.5	26.5	11.5	29.5	9.5	26.5				
Max Q Clear Time (g_c+I1), s	3.6	14.4	5.2	24.6	7.1	11.4	7.1	21.5				
Green Ext Time (p_c), s	0.0	2.2	0.1	1.0	0.1	1.8	0.1	2.8				
Intersection Summary												
HCM 6th Ctrl Delay	29.7											
HCM 6th LOS	C											

Portage Creek TIS
Build Out 2024 _ Original AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔	↔	↔	↔↔		↔	↔↔	
Traffic Volume (veh/h)	2	0	3	6	4	243	4	337	34	232	293	7
Future Volume (veh/h)	2	0	3	6	4	243	4	337	34	232	293	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	1411	1411	1411	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	3	0	4	8	5	333	4	362	37	286	362	9
Peak Hour Factor	0.75	0.75	0.75	0.73	0.73	0.73	0.93	0.93	0.93	0.81	0.81	0.81
Percent Heavy Veh, %	33	33	33	3	3	3	4	4	4	3	3	3
Cap, veh/h	263	0	261	279	160	377	582	1579	160	680	2070	51
Arrive On Green	0.24	0.00	0.24	0.24	0.24	0.24	0.01	0.49	0.49	0.10	0.59	0.59
Sat Flow, veh/h	769	0	1088	898	667	1572	1753	3205	326	1767	3515	87
Grp Volume(v), veh/h	3	0	4	13	0	333	4	197	202	286	181	190
Grp Sat Flow(s),veh/h/ln	769	0	1088	1565	0	1572	1753	1749	1782	1767	1763	1840
Q Serve(g_s), s	0.3	0.0	0.3	0.0	0.0	18.7	0.1	5.9	5.9	6.7	4.3	4.3
Cycle Q Clear(g_c), s	0.8	0.0	0.3	0.5	0.0	18.7	0.1	5.9	5.9	6.7	4.3	4.3
Prop In Lane	1.00		1.00	0.62		1.00	1.00		0.18	1.00		0.05
Lane Grp Cap(c), veh/h	263	0	261	439	0	377	582	861	878	680	1038	1083
V/C Ratio(X)	0.01	0.00	0.02	0.03	0.00	0.88	0.01	0.23	0.23	0.42	0.17	0.18
Avail Cap(c_a), veh/h	462	0	536	830	0	775	1049	861	878	980	1038	1083
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	26.5	26.6	0.0	33.5	11.5	13.3	13.3	8.4	8.6	8.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.6	0.6	0.4	0.4	0.4
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(50%),veh/ln	0.1	0.0	0.1	0.2	0.0	7.7	0.0	2.3	2.4	2.3	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	26.5	26.6	0.0	40.4	11.5	13.9	13.9	8.9	9.0	9.0
LnGrp LOS	C	A	C	C	A	D	B	B	B	A	A	A
Approach Vol, veh/h		7			346			403			657	
Approach Delay, s/veh		26.7			39.9			13.9			8.9	
Approach LOS		C			D			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	50.0		26.9	5.7	58.8		26.9				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+1), s	19.7	7.9		20.7	2.1	6.3		2.8				
Green Ext Time (p_c), s	0.7	2.4		1.2	0.0	2.2		0.0				

HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
Build Out 2024 _ Original AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	744	129	113	528	53	177	155	171	109	118	4
Future Volume (veh/h)	13	744	129	113	528	53	177	155	171	109	118	4
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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1841	1841	1841
Adj Flow Rate, veh/h	14	783	136	119	556	56	253	221	244	160	174	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.70	0.70	0.70	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	4	4	4
Cap, veh/h	361	1044	181	248	1116	112	518	723	322	513	363	13
Arrive On Green	0.02	0.11	0.11	0.07	0.34	0.34	0.17	0.20	0.20	0.17	0.20	0.20
Sat Flow, veh/h	1781	3027	526	1767	3235	325	1767	3526	1572	1753	1769	61
Grp Volume(v), veh/h	14	460	459	119	302	310	253	221	244	160	0	180
Grp Sat Flow(s),veh/h/ln	1781	1777	1776	1767	1763	1797	1767	1763	1572	1753	0	1830
Q Serve(g_s), s	0.0	25.1	25.1	0.0	13.6	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Cycle Q Clear(g_c), s	0.0	25.1	25.1	0.0	13.6	13.6	0.0	5.3	14.6	0.0	0.0	8.7
Prop In Lane	1.00		0.30	1.00		0.18	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	361	613	613	248	608	620	518	723	322	513	0	375
V/C Ratio(X)	0.04	0.75	0.75	0.48	0.50	0.50	0.49	0.31	0.76	0.31	0.00	0.48
Avail Cap(c_a), veh/h	392	613	613	279	608	620	518	723	322	513	0	375
HCM Platoon Ratio	0.33	0.33	0.33	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	40.1	40.1	41.2	25.9	25.9	30.9	33.7	37.4	27.7	0.0	35.0
Incr Delay (d2), s/veh	0.0	8.2	8.2	1.4	2.9	2.9	0.7	1.1	15.3	0.3	0.0	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(50%),veh/ln	0.3	13.2	13.2	2.8	6.0	6.1	5.2	2.4	6.9	3.1	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	48.3	48.3	42.7	28.8	28.8	31.6	34.8	52.7	28.0	0.0	39.4
LnGrp LOS	C	D	D	D	C	C	C	C	D	C	A	D
Approach Vol, veh/h	933			731			718			340		
Approach Delay, s/veh	48.0			31.0			39.8			34.0		
Approach LOS	D			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	40.0	22.8	25.0	12.2	40.0	22.8	25.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	34.5	34.5	15.5	20.5	8.5	34.5	15.5	20.5				
Max Q Clear Time (g_c+I), s	27.1	27.1	2.0	16.6	2.0	15.6	2.0	10.7				
Green Ext Time (p_c), s	0.1	3.3	0.3	0.9	0.0	3.5	0.6	0.6				

Intersection Summary

HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	19	11	367	300	2
Future Vol, veh/h	8	19	11	367	300	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	21	12	399	326	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	551	164	328	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	224	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	464	852	1228	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	459	852	1228	-	-	-
Mov Cap-2 Maneuver	545	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1228	-	545	852	-	-
HCM Lane V/C Ratio	0.01	-	0.016	0.024	-	-
HCM Control Delay (s)	8	-	11.7	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	22	7	354	296	23
Future Vol, veh/h	24	22	7	354	296	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	94	94	87	87
Heavy Vehicles, %	0	0	5	5	5	5
Mvmt Flow	40	37	7	377	340	26

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	556	183	366
Stage 1	353	-	-
Stage 2	203	-	-
Critical Hdwy	6.8	6.9	4.2
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.3	2.25
Pot Cap-1 Maneuver	466	834	1168
Stage 1	688	-	-
Stage 2	817	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	463	834	1168
Mov Cap-2 Maneuver	547	-	-
Stage 1	684	-	-
Stage 2	817	-	-

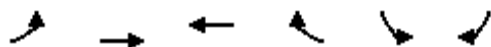
Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1168	-	547	834	-	-
HCM Lane V/C Ratio	0.006	-	0.073	0.044	-	-
HCM Control Delay (s)	8.1	-	12.1	9.5	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
Build Out 2024 _ Original AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Traffic Volume (veh/h)	19	933	800	17	17	27			
Future Volume (Veh/h)	19	933	800	17	17	27			
Sign Control		Free	Free		Stop				
Grade		0%	0%		0%				
Peak Hour Factor	1.00	1.00	0.77	0.77	0.70	0.70			
Hourly flow rate (vph)	19	933	1039	22	24	39			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type	None		TWLTL						
Median storage veh)			2						
Upstream signal (ft)			319						
pX, platoon unblocked	0.81				0.81	0.81			
vC, conflicting volume	1061				1321	530			
vC1, stage 1 conf vol					1050				
vC2, stage 2 conf vol					271				
vCu, unblocked vol	599				921	0			
tC, single (s)	4.1				6.9	7.0			
tC, 2 stage (s)					5.9				
tF (s)	2.2				3.6	3.4			
p0 queue free %	98				94	95			
cM capacity (veh/h)	786				379	863			
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2	
Volume Total	152	267	267	267	693	368	24	39	
Volume Left	19	0	0	0	0	0	24	0	
Volume Right	0	0	0	0	0	22	0	39	
cSH	786	1700	1700	1700	1700	1700	379	863	
Volume to Capacity	0.02	0.16	0.16	0.16	0.41	0.22	0.06	0.05	
Queue Length 95th (ft)	2	0	0	0	0	0	5	4	
Control Delay (s)	1.4	0.0	0.0	0.0	0.0	0.0	15.1	9.4	
Lane LOS	A							C	A
Approach Delay (s)	0.2				0.0				11.6
Approach LOS								B	
Intersection Summary									
Average Delay			0.5						
Intersection Capacity Utilization			36.8%			ICU Level of Service			A
Analysis Period (min)			15						

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	119	235	240	219	293	248	148	227	155	39	140	115
Average Queue (ft)	32	148	138	51	142	141	43	100	71	13	62	58
95th Queue (ft)	79	231	211	119	242	232	93	172	153	33	120	114
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)		1	1	0	1	1						
Queuing Penalty (veh)		4	2	0	4	4						
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	1						0	
Queuing Penalty (veh)				0	2						0	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	T	TR	L	T	TR
Maximum Queue (ft)	54	54	52	163	137	141	130	82	44
Average Queue (ft)	3	4	11	70	58	52	41	19	9
95th Queue (ft)	22	23	38	117	126	116	81	53	32
Link Distance (ft)	457	457	484	484	207	207	868	868	868
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)									
Storage Blk Time (%)					0				
Queuing Penalty (veh)					0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	71	312	312	123	154	138	124	175	180	125	138	145
Average Queue (ft)	14	214	216	54	88	54	84	52	71	60	61	64
95th Queue (ft)	45	319	318	104	147	118	128	144	137	111	114	133
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		5	5					0	0			
Queuing Penalty (veh)		23	21					0	0			
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		15					11	0	4	0		
Queuing Penalty (veh)		2					9	0	6	0		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	30	30
Average Queue (ft)	6	10	2
95th Queue (ft)	25	34	14
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	50	55	25
Average Queue (ft)	18	15	1
95th Queue (ft)	45	45	8
Link Distance (ft)		222	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	75		50
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	73	30	55
Average Queue (ft)	11	17	18
95th Queue (ft)	44	40	47
Link Distance (ft)	80		354
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 76

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Portage Creek TIS
Build Out 2024 _ Original PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	595	223	182	788	27	187	416	217	67	535	132
Future Volume (veh/h)	194	595	223	182	788	27	187	416	217	67	535	132
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	204	626	0	192	829	28	225	501	261	80	637	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	329	1518		443	1522	51	195	546	283	181	632	155
Arrive On Green	0.07	0.43	0.00	0.02	0.14	0.14	0.07	0.24	0.24	0.06	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	1795	3535	119	1795	2280	1183	1795	2849	701
Grp Volume(v), veh/h	204	626	0	192	420	437	225	393	369	80	400	394
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1864	1795	1791	1672	1795	1791	1759
Q Serve(g_s), s	7.4	14.1	0.0	6.7	25.1	25.1	8.5	24.6	24.8	3.9	25.5	25.5
Cycle Q Clear(g_c), s	7.4	14.1	0.0	6.7	25.1	25.1	8.5	24.6	24.8	3.9	25.5	25.5
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.71	1.00		0.40
Lane Grp Cap(c), veh/h	329	1518		443	771	802	195	429	401	181	397	390
V/C Ratio(X)	0.62	0.41		0.43	0.54	0.54	1.15	0.92	0.92	0.44	1.01	1.01
Avail Cap(c_a), veh/h	329	1518		443	771	802	195	429	401	213	397	390
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	22.7	0.0	17.8	38.9	38.9	37.3	42.6	42.7	33.9	44.8	44.8
Incr Delay (d2), s/veh	3.5	0.8	0.0	0.7	2.8	2.7	111.3	24.3	26.4	1.7	47.1	48.1
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(50%),veh/ln	3.2	5.9	0.0	3.0	12.6	13.1	7.4	13.6	13.0	1.8	16.3	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	23.5	0.0	18.5	41.6	41.5	148.6	66.9	69.1	35.6	91.8	92.8
LnGrp LOS	C	C		B	D	D	F	E	E	D	F	F
Approach Vol, veh/h	830			1049			987			874		
Approach Delay, s/veh	23.5			37.3			86.3			87.1		
Approach LOS	C			D			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	33.0	15.0	55.0	14.0	31.0	15.0	55.0				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	8.5	25.5	8.5	49.5	8.5	25.5	8.5	49.5				
Max Q Clear Time (g_c+I1), s	5.9	26.8	9.4	27.1	10.5	27.5	8.7	16.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	5.4	0.0	0.0	0.0	4.6				

Intersection Summary

HCM 6th Ctrl Delay 58.8
HCM 6th LOS E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Portage Creek TIS

Build Out 2024 _ Original PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	7	6	9	15	6	336	4	602	11	351	732	313
Future Volume (veh/h)	7	6	9	15	6	336	4	602	11	351	732	313
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	12	10	15	18	7	400	4	640	12	394	822	352
Peak Hour Factor	0.60	0.60	0.60	0.84	0.84	0.84	0.94	0.94	0.94	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	251	203	356	350	127	441	254	1577	30	573	1400	598
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.44	0.44	0.14	0.57	0.57
Sat Flow, veh/h	709	740	1299	1059	464	1610	1795	3597	67	1795	2445	1044
Grp Volume(v), veh/h	20	0	17	25	0	400	4	319	333	394	601	573
Grp Sat Flow(s),veh/h/ln	1253	0	1495	1523	0	1610	1795	1791	1873	1795	1791	1697
Q Serve(g_s), s	0.0	0.0	0.9	0.3	0.0	24.6	0.1	12.5	12.5	11.6	22.2	22.3
Cycle Q Clear(g_c), s	0.8	0.0	0.9	1.1	0.0	24.6	0.1	12.5	12.5	11.6	22.2	22.3
Prop In Lane	0.61		0.87	0.72		1.00	1.00		0.04	1.00		0.61
Lane Grp Cap(c), veh/h	400	0	410	478	0	441	254	785	821	573	1025	972
V/C Ratio(X)	0.05	0.00	0.04	0.05	0.00	0.91	0.02	0.41	0.41	0.69	0.59	0.59
Avail Cap(c_a), veh/h	601	0	656	727	0	706	678	785	821	757	1025	972
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	27.4	27.4	0.0	36.0	16.2	19.7	19.7	12.6	14.1	14.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	10.2	0.0	1.6	1.5	1.7	2.5	2.6
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(50%),veh/ln	0.4	0.0	0.3	0.5	0.0	10.8	0.1	5.3	5.6	4.4	8.9	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	27.4	27.5	0.0	46.2	16.2	21.2	21.2	14.3	16.6	16.8
LnGrp LOS	C	A	C	C	A	D	B	C	C	B	B	B
Approach Vol, veh/h		37			425			656			1568	
Approach Delay, s/veh		27.4			45.1			21.2			16.1	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.5	50.0		33.1	5.8	63.8		33.1				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+1.6), s	13.6	14.5		26.6	2.1	24.3		2.9				
Green Ext Time (p_c), s	1.0	4.2		1.5	0.0	8.2		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			22.1									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Portage Creek TIS
Build Out 2024 _ Original PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	728	138	160	790	114	122	145	121	117	161	17
Future Volume (veh/h)	27	728	138	160	790	114	122	145	121	117	161	17
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	28	766	145	168	832	120	142	169	141	143	196	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	254	1102	209	247	1161	167	511	701	313	575	327	35
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2981	564	1795	3141	453	1795	3582	1598	1795	1674	179
Grp Volume(v), veh/h	28	456	455	168	474	478	142	169	141	143	0	217
Grp Sat Flow(s),veh/h/ln	1781	1777	1769	1795	1791	1804	1795	1791	1598	1795	0	1853
Q Serve(g_s), s	0.0	28.3	28.4	1.4	26.1	26.1	0.0	4.6	9.0	0.0	0.0	12.3
Cycle Q Clear(g_c), s	0.0	28.3	28.4	1.4	26.1	26.1	0.0	4.6	9.0	0.0	0.0	12.3
Prop In Lane	1.00		0.32	1.00		0.25	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	254	657	654	247	662	667	511	701	313	575	0	363
V/C Ratio(X)	0.11	0.70	0.70	0.68	0.72	0.72	0.28	0.24	0.45	0.25	0.00	0.60
Avail Cap(c_a), veh/h	418	657	654	412	662	667	511	701	313	575	0	363
HCM Platoon Ratio	0.33	0.33	0.33	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.1	44.3	44.3	47.6	31.1	31.1	33.8	39.0	40.8	28.2	0.0	42.1
Incr Delay (d2), s/veh	0.2	6.0	6.0	3.3	6.5	6.5	0.3	0.8	4.6	0.2	0.0	7.1
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(50%),veh/ln	0.7	14.6	14.5	4.8	12.2	12.3	3.3	2.1	3.9	3.0	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	50.3	50.3	50.9	37.6	37.6	34.1	39.9	45.4	28.5	0.0	49.3
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	A	D
Approach Vol, veh/h	939			1120			452			360		
Approach Delay, s/veh	50.0			39.6			39.8			41.0		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	48.0	27.5	27.0	12.5	48.0	27.5	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	17.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+I), s	13.4	30.4	2.0	11.0	2.0	28.1	2.0	14.3				
Green Ext Time (p_c), s	0.4	4.5	0.2	1.1	0.0	5.2	0.2	0.7				

Intersection Summary

HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	16	30	613	745	11
Future Vol, veh/h	4	16	30	613	745	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	17	33	666	810	12
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1215	411	822	0	-	0
Stage 1	816	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	174	590	803	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	167	590	803	-	-	-
Mov Cap-2 Maneuver	287	-	-	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.6	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	287	590	-	-
HCM Lane V/C Ratio	0.041	-	0.015	0.029	-	-
HCM Control Delay (s)	9.7	-	17.7	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	0.1	-	-

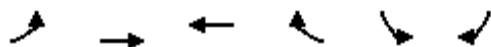
HCM 6th TWSC
13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Portage Creek TIS
Build Out 2024 _ Original PM Peak

Intersection							
Int Delay, s/veh	0.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	25	43	19	618	691	70	
Future Vol, veh/h	25	43	19	618	691	70	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	75	0	50	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	75	75	93	93	81	81	
Heavy Vehicles, %	2	2	0	0	1	1	
Mvmt Flow	33	57	20	665	853	86	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	1269	470	939	0	-	0	
Stage 1	896	-	-	-	-	-	
Stage 2	373	-	-	-	-	-	
Critical Hdwy	6.84	6.94	4.1	-	-	-	
Critical Hdwy Stg 1	5.84	-	-	-	-	-	
Critical Hdwy Stg 2	5.84	-	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.2	-	-	-	
Pot Cap-1 Maneuver	160	540	738	-	-	-	
Stage 1	359	-	-	-	-	-	
Stage 2	666	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	156	540	738	-	-	-	
Mov Cap-2 Maneuver	270	-	-	-	-	-	
Stage 1	349	-	-	-	-	-	
Stage 2	666	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	15.3		0.3		0		
HCM LOS	C						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	738		-	270	540	-	-
HCM Lane V/C Ratio	0.028		-	0.123	0.106	-	-
HCM Control Delay (s)	10		-	20.2	12.5	-	-
HCM Lane LOS	B		-	C	B	-	-
HCM 95th %tile O(veh)	0.1		-	0.4	0.4	-	-

HCM Unsignalized Intersection Capacity Analysis 15: Centre Ave/Centre Ave (PB) & Site Dr

Portage Creek TIS
Build Out 2024 _ Original PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		4↑↑↑	↑↑		↑	↑		
Traffic Volume (veh/h)	69	973	1075	32	39	59		
Future Volume (Veh/h)	69	973	1075	32	39	59		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95		
Hourly flow rate (vph)	73	1024	1168	35	41	62		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLTL					
Median storage (veh)			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.82				0.82	0.82		
vC, conflicting volume	1203				1588	602		
vC1, stage 1 conf vol					1186			
vC2, stage 2 conf vol					402			
vCu, unblocked vol	802				1273	67		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	89				86	92		
cM capacity (veh/h)	668				301	806		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	219	293	293	293	779	424	41	62
Volume Left	73	0	0	0	0	0	41	0
Volume Right	0	0	0	0	0	35	0	62
cSH	668	1700	1700	1700	1700	1700	301	806
Volume to Capacity	0.11	0.17	0.17	0.17	0.46	0.25	0.14	0.08
Queue Length 95th (ft)	9	0	0	0	0	0	12	6
Control Delay (s)	4.6	0.0	0.0	0.0	0.0	0.0	18.8	9.8
Lane LOS	A						C	A
Approach Delay (s)	0.9				0.0		13.4	
Approach LOS							B	
Intersection Summary								
Average Delay			1.0					
Intersection Capacity Utilization			59.2%		ICU Level of Service			B
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	210	231	208	220	293	330	276	234	343	174	291	292
Average Queue (ft)	94	130	107	130	233	237	129	140	140	52	172	179
95th Queue (ft)	174	193	167	239	312	312	243	220	266	142	271	274
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)	1	0	0	0	13	17					4	7
Queuing Penalty (veh)	1	1	0	0	65	85					16	31
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	13		1			0	17	
Queuing Penalty (veh)				1	24		1			1	12	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	52	30	50	138	31	181	188	344	153	153
Average Queue (ft)	6	12	12	88	4	90	85	96	55	65
95th Queue (ft)	26	34	38	134	22	160	166	193	110	124
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)							0			
Queuing Penalty (veh)							0			
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						1				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	312	310	200	411	330	112	82	117	115	156	259
Average Queue (ft)	32	194	198	87	170	144	67	17	59	50	81	101
95th Queue (ft)	116	284	274	161	299	259	109	55	100	94	127	201
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		3	2									
Queuing Penalty (veh)		13	11									
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)		11			8		4	0	3	1		
Queuing Penalty (veh)		3			12		3	0	4	1		

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	30	76
Average Queue (ft)	1	9	10
95th Queue (ft)	10	32	39
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	SB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (ft)	53	74	31	116	130
Average Queue (ft)	20	28	6	7	13
95th Queue (ft)	48	56	27	49	71
Link Distance (ft)		222		310	310
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75		50		
Storage Blk Time (%)		1	0		
Queuing Penalty (veh)		0	0		

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	114	164	78
Average Queue (ft)	38	47	32
95th Queue (ft)	91	128	53
Link Distance (ft)	80		354
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		150	
Storage Blk Time (%)		6	
Queuing Penalty (veh)		4	

Zone Summary

Zone wide Queuing Penalty: 287

HCM 6th TWSC
10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Portage Creek TIS
Build Out 2024 _ Scenario #1 AM Peak

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	9	11	352	300	2
Future Vol, veh/h	25	9	11	352	300	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	10	12	383	326	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	543	164	328	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	470	852	1228	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	465	852	1228	-	-	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.2	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1228	-	549	852	-	-
HCM Lane V/C Ratio	0.01	-	0.049	0.011	-	-
HCM Control Delay (s)	8	-	11.9	9.3	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0	-	-

HCM 6th TWSC
10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Portage Creek TIS
Build Out 2024 _ Scenario #1 PM Peak

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	11	30	605	745	11
Future Vol, veh/h	14	11	30	605	745	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	12	33	658	810	12
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1211	411	822	0	-	0
Stage 1	816	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	175	590	803	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	168	590	803	-	-	-
Mov Cap-2 Maneuver	287	-	-	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.1	0.5		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	287	590	-	-
HCM Lane V/C Ratio	0.041	-	0.053	0.02	-	-
HCM Control Delay (s)	9.7	-	18.2	11.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile O(veh)	0.1	-	0.2	0.1	-	-

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	52	52	29
Average Queue (ft)	19	12	3
95th Queue (ft)	45	38	17
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	30	31
Average Queue (ft)	10	9	6
95th Queue (ft)	33	30	26
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM 6th TWSC
10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Portage Creek TIS
Build Out 2024 _ Scenario #2 AM Peak

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	19	11	350	300	2
Future Vol, veh/h	35	19	11	350	300	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	21	12	380	326	2
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	541	164	328	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	471	852	1228	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	466	852	1228	-	-	-
Mov Cap-2 Maneuver	550	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	11.1		0.2		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT SBR
Capacity (veh/h)	1228		-	550	852	- -
HCM Lane V/C Ratio	0.01		-	0.069	0.024	- -
HCM Control Delay (s)	8		-	12	9.3	- -
HCM Lane LOS	A		-	B	A	- -
HCM 95th %tile O(veh)	0		-	0.2	0.1	- -

HCM 6th TWSC
10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Portage Creek TIS
Build Out 2024 _ Scenario #2 PM Peak

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	16	30	603	745	11
Future Vol, veh/h	19	16	30	603	745	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	17	33	655	810	12
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1210	411	822	0	-	0
Stage 1	816	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	175	590	803	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	168	590	803	-	-	-
Mov Cap-2 Maneuver	287	-	-	-	-	-
Stage 1	379	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.2	0.5		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	287	590	-	-
HCM Lane V/C Ratio	0.041	-	0.072	0.029	-	-
HCM Control Delay (s)	9.7	-	18.5	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile O(veh)	0.1	-	0.2	0.1	-	-

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	53	30	31
Average Queue (ft)	26	17	2
95th Queue (ft)	52	41	15
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	72	52	53
Average Queue (ft)	18	18	15
95th Queue (ft)	48	44	43
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM 6th Signalized Intersection Summary

2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

02/06/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	192	590	221	182	788	27	187	416	217	67	537	132
Future Volume (veh/h)	192	590	221	182	788	27	187	416	217	67	537	132
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	1856	1856	1856	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	202	621	0	192	829	28	225	501	261	80	639	157
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	1	1	1	1	1	1	1	1	1
Cap, veh/h	302	1458		413	1462	49	223	604	313	204	680	167
Arrive On Green	0.07	0.41	0.00	0.02	0.14	0.14	0.08	0.26	0.26	0.06	0.24	0.24
Sat Flow, veh/h	1767	3526	1572	1795	3535	119	1795	2280	1183	1795	2851	699
Grp Volume(v), veh/h	202	621	0	192	420	437	225	393	369	80	401	395
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1795	1791	1864	1795	1791	1672	1795	1791	1759
Q Serve(g_s), s	7.5	14.4	0.0	7.0	25.2	25.2	9.5	23.8	23.9	3.8	25.3	25.3
Cycle Q Clear(g_c), s	7.5	14.4	0.0	7.0	25.2	25.2	9.5	23.8	23.9	3.8	25.3	25.3
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.71	1.00		0.40
Lane Grp Cap(c), veh/h	302	1458		413	741	771	223	475	443	204	427	420
V/C Ratio(X)	0.67	0.43		0.46	0.57	0.57	1.01	0.83	0.83	0.39	0.94	0.94
Avail Cap(c_a), veh/h	302	1458		413	741	771	223	475	443	251	428	421
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	24.0	0.0	19.5	40.0	40.0	36.1	39.8	39.9	32.1	43.0	43.0
Incr Delay (d2), s/veh	5.6	0.9	0.0	0.8	3.1	3.0	62.1	11.6	12.8	1.2	28.6	29.4
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(50%),veh/ln	3.5	6.1	0.0	3.1	12.7	13.2	8.6	11.8	11.2	1.7	14.4	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	24.9	0.0	20.3	43.1	43.0	98.2	51.4	52.6	33.3	71.6	72.4
LnGrp LOS	C	C		C	D	D	F	D	D	C	E	E
Approach Vol, veh/h	823				1049				987			
Approach Delay, s/veh	25.6				38.9				62.5			
Approach LOS	C				D				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	36.0	14.0	53.1	15.0	32.9	14.0	53.1				
Change Period (Y+Rc), s	5.5	5.5	6.5	5.5	5.5	5.5	6.5	5.5				
Max Green Setting (Gmax), s	9.5	27.5	7.5	47.5	9.5	27.5	7.5	47.5				
Max Q Clear Time (g_c+I1), s	5.8	25.9	9.5	27.2	11.5	27.3	9.0	16.4				
Green Ext Time (p_c), s	0.0	0.8	0.0	5.3	0.0	0.1	0.0	4.5				

Intersection Summary

HCM 6th Ctrl Delay 49.2

HCM 6th LOS D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

02/06/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	7	6	9	15	6	336	4	602	11	351	732	313
Future Volume (veh/h)	7	6	9	15	6	336	4	602	11	351	732	313
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	12	10	15	18	7	400	4	640	12	394	822	352
Peak Hour Factor	0.60	0.60	0.60	0.84	0.84	0.84	0.94	0.94	0.94	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	251	203	356	350	127	441	254	1577	30	573	1400	598
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.01	0.44	0.44	0.14	0.57	0.57
Sat Flow, veh/h	709	740	1299	1059	464	1610	1795	3597	67	1795	2445	1044
Grp Volume(v), veh/h	20	0	17	25	0	400	4	319	333	394	601	573
Grp Sat Flow(s),veh/h/ln	1253	0	1495	1523	0	1610	1795	1791	1873	1795	1791	1697
Q Serve(g_s), s	0.0	0.0	0.9	0.3	0.0	24.6	0.1	12.5	12.5	11.6	22.2	22.3
Cycle Q Clear(g_c), s	0.8	0.0	0.9	1.1	0.0	24.6	0.1	12.5	12.5	11.6	22.2	22.3
Prop In Lane	0.61		0.87	0.72		1.00	1.00		0.04	1.00		0.61
Lane Grp Cap(c), veh/h	400	0	410	478	0	441	254	785	821	573	1025	972
V/C Ratio(X)	0.05	0.00	0.04	0.05	0.00	0.91	0.02	0.41	0.41	0.69	0.59	0.59
Avail Cap(c_a), veh/h	601	0	656	727	0	706	678	785	821	757	1025	972
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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	27.4	27.4	0.0	36.0	16.2	19.7	19.7	12.6	14.1	14.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.0	0.0	10.2	0.0	1.6	1.5	1.7	2.5	2.6
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(50%),veh/ln	0.4	0.0	0.3	0.5	0.0	10.8	0.1	5.3	5.6	4.4	8.9	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	0.0	27.4	27.5	0.0	46.2	16.2	21.2	21.2	14.3	16.6	16.8
LnGrp LOS	C	A	C	C	A	D	B	C	C	B	B	B
Approach Vol, veh/h		37			425			656			1568	
Approach Delay, s/veh		27.4			45.1			21.2			16.1	
Approach LOS		C			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.5	50.0		33.1	5.8	63.8		33.1				
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s	25.0	45.0		45.0	25.0	45.0		45.0				
Max Q Clear Time (g_c+1.6), s	13.6	14.5		26.6	2.1	24.3		2.9				
Green Ext Time (p_c), s	1.0	4.2		1.5	0.0	8.2		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			22.1									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

02/06/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	723	138	160	790	114	122	145	121	117	161	17
Future Volume (veh/h)	27	723	138	160	790	114	122	145	121	117	161	17
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	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	28	761	145	168	832	120	142	169	141	143	196	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.86	0.86	0.86	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	254	1100	210	249	1161	167	511	701	313	575	327	35
Arrive On Green	0.02	0.12	0.12	0.06	0.37	0.37	0.19	0.20	0.20	0.19	0.20	0.20
Sat Flow, veh/h	1781	2978	567	1795	3141	453	1795	3582	1598	1795	1674	179
Grp Volume(v), veh/h	28	454	452	168	474	478	142	169	141	143	0	217
Grp Sat Flow(s),veh/h/ln	1781	1777	1768	1795	1791	1804	1795	1791	1598	1795	0	1853
Q Serve(g_s), s	0.0	28.2	28.2	1.3	26.1	26.1	0.0	4.6	9.0	0.0	0.0	12.3
Cycle Q Clear(g_c), s	0.0	28.2	28.2	1.3	26.1	26.1	0.0	4.6	9.0	0.0	0.0	12.3
Prop In Lane	1.00		0.32	1.00		0.25	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	254	657	653	249	662	667	511	701	313	575	0	363
V/C Ratio(X)	0.11	0.69	0.69	0.68	0.72	0.72	0.28	0.24	0.45	0.25	0.00	0.60
Avail Cap(c_a), veh/h	418	657	653	413	662	667	511	701	313	575	0	363
HCM Platoon Ratio	0.33	0.33	0.33	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.1	44.2	44.2	47.5	31.1	31.1	33.8	39.0	40.8	28.2	0.0	42.1
Incr Delay (d2), s/veh	0.2	5.9	5.9	3.2	6.5	6.5	0.3	0.8	4.6	0.2	0.0	7.1
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(50%),veh/ln	0.7	14.5	14.4	4.7	12.2	12.3	3.3	2.1	3.9	3.0	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	50.1	50.1	50.7	37.6	37.6	34.1	39.9	45.4	28.5	0.0	49.3
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	A	D
Approach Vol, veh/h	934			1120			452			360		
Approach Delay, s/veh	49.8			39.6			39.8			41.0		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	48.0	27.5	27.0	12.5	48.0	27.5	27.0				
Change Period (Y+Rc), s	5.5	5.5	5.5	4.5	5.5	5.5	5.5	4.5				
Max Green Setting (Gmax), s	17.5	42.5	11.5	22.5	17.5	42.5	11.5	22.5				
Max Q Clear Time (g_c+1.3), s	13.3	30.2	2.0	11.0	2.0	28.1	2.0	14.3				
Green Ext Time (p_c), s	0.4	4.5	0.2	1.1	0.0	5.2	0.2	0.7				

Intersection Summary

HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	16	30	611	745	11
Future Vol, veh/h	6	16	30	611	745	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	17	33	664	810	12

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1214	411	822
Stage 1	816	-	-
Stage 2	398	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	174	590	803
Stage 1	395	-	-
Stage 2	647	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	167	590	803
Mov Cap-2 Maneuver	287	-	-
Stage 1	379	-	-
Stage 2	647	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	287	590	-	-
HCM Lane V/C Ratio	0.041	-	0.023	0.029	-	-
HCM Control Delay (s)	9.7	-	17.8	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-

HCM 6th TWSC
13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

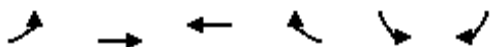
02/06/2023

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	45	19	616	691	70
Future Vol, veh/h	25	45	19	616	691	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	93	93	81	81
Heavy Vehicles, %	2	2	0	0	1	1
Mvmt Flow	33	60	20	662	853	86
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1267	470	939	0	-	0
Stage 1	896	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.1	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.2	-	-	-
Pot Cap-1 Maneuver	161	540	738	-	-	-
Stage 1	359	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	157	540	738	-	-	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.2	0.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	738	-	271	540	-	-
HCM Lane V/C Ratio	0.028	-	0.123	0.111	-	-
HCM Control Delay (s)	10	-	20.1	12.5	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.4	-	-

HCM Unsignalized Intersection Capacity Analysis

15: Centre Ave/Centre Ave (PB) & Site Dr

02/06/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑↔		↖	↗		
Traffic Volume (veh/h)	69	973	1075	32	30	59		
Future Volume (Veh/h)	69	973	1075	32	30	59		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95		
Hourly flow rate (vph)	73	1024	1168	35	32	62		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type		None	TWLT					
Median storage veh			2					
Upstream signal (ft)			319					
pX, platoon unblocked	0.81				0.81	0.81		
vC, conflicting volume	1203				1588	602		
vC1, stage 1 conf vol					1186			
vC2, stage 2 conf vol					402			
vCu, unblocked vol	787				1261	47		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	89				89	92		
cM capacity (veh/h)	672				304	825		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1	SB 2
Volume Total	219	293	293	293	779	424	32	62
Volume Left	73	0	0	0	0	0	32	0
Volume Right	0	0	0	0	0	35	0	62
cSH	672	1700	1700	1700	1700	1700	304	825
Volume to Capacity	0.11	0.17	0.17	0.17	0.46	0.25	0.11	0.08
Queue Length 95th (ft)	9	0	0	0	0	0	9	6
Control Delay (s)	4.5	0.0	0.0	0.0	0.0	0.0	18.2	9.7
Lane LOS	A						C	A
Approach Delay (s)	0.9				0.0		12.6	
Approach LOS							B	
Intersection Summary								
Average Delay			0.9					
Intersection Capacity Utilization			59.2%		ICU Level of Service			B
Analysis Period (min)			15					

Intersection: 2: Shaver Rd (PB)/Shaver Rd (PB) & Centre Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	T	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	204	262	241	220	312	293	252	234	240	174	309	311
Average Queue (ft)	83	140	138	126	228	246	122	146	146	50	202	207
95th Queue (ft)	174	202	211	226	311	329	222	218	240	133	324	329
Link Distance (ft)	210	210	210		220	220		504	504		209	209
Upstream Blk Time (%)	0	1	1	0	13	18					19	20
Queuing Penalty (veh)	0	1	1	0	67	92					81	85
Storage Bay Dist (ft)				316			275			150		
Storage Blk Time (%)				0	13					0	28	
Queuing Penalty (veh)				0	24					0	20	

Intersection: 7: Shaver Rd (PB) & Fire Station Dr/S. Westnedge Ave (PB)

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	30	30	54	136	31	180	184	128	173	223
Average Queue (ft)	4	10	16	86	3	77	79	72	56	73
95th Queue (ft)	19	33	46	125	18	150	166	117	124	156
Link Distance (ft)	457	457	484	484		207	207	868	868	868
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)					150					
Storage Blk Time (%)						1				
Queuing Penalty (veh)						0				

Intersection: 8: S. Westnedge Ave (PB) & Centre Ave/Center Ave (PB)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	TR
Maximum Queue (ft)	174	308	312	200	350	272	124	161	158	77	138	203
Average Queue (ft)	29	197	222	111	189	144	73	36	61	42	65	87
95th Queue (ft)	100	286	307	204	308	240	120	108	129	72	115	166
Link Distance (ft)		240	240		855	855		178	178		342	342
Upstream Blk Time (%)		3	5					0				
Queuing Penalty (veh)		14	22					0				
Storage Bay Dist (ft)	150			175			100			100		
Storage Blk Time (%)	0	10		1	7		7	0	3			
Queuing Penalty (veh)	0	3		6	12		5	0	4			

Queuing and Blocking Report

Build Out 2024

02/06/2023

Intersection: 10: Shaver Rd/Shaver Rd (PB) & North Site Dr

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	31	30	68
Average Queue (ft)	5	9	11
95th Queue (ft)	22	31	39
Link Distance (ft)	507		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	125
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Shaver Rd (PB)/Shaver Rd & Walgreens Dr

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	100	237	72	153	175	220	255
Average Queue (ft)	29	60	14	8	0	40	45
95th Queue (ft)	89	176	47	61	0	163	175
Link Distance (ft)		222		209	209	310	310
Upstream Blk Time (%)		12					
Queuing Penalty (veh)		0					
Storage Bay Dist (ft)	75		50				
Storage Blk Time (%)	21	14	8				
Queuing Penalty (veh)	12	4	27				

Intersection: 15: Centre Ave/Centre Ave (PB) & Site Dr

Movement	EB	EB	SB	SB
Directions Served	LT	T	L	R
Maximum Queue (ft)	141	80	94	71
Average Queue (ft)	50	3	30	31
95th Queue (ft)	116	27	73	55
Link Distance (ft)	80	80		354
Upstream Blk Time (%)	5	0		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: Dummy #1 & Centre Ave (PB)/Centre Ave

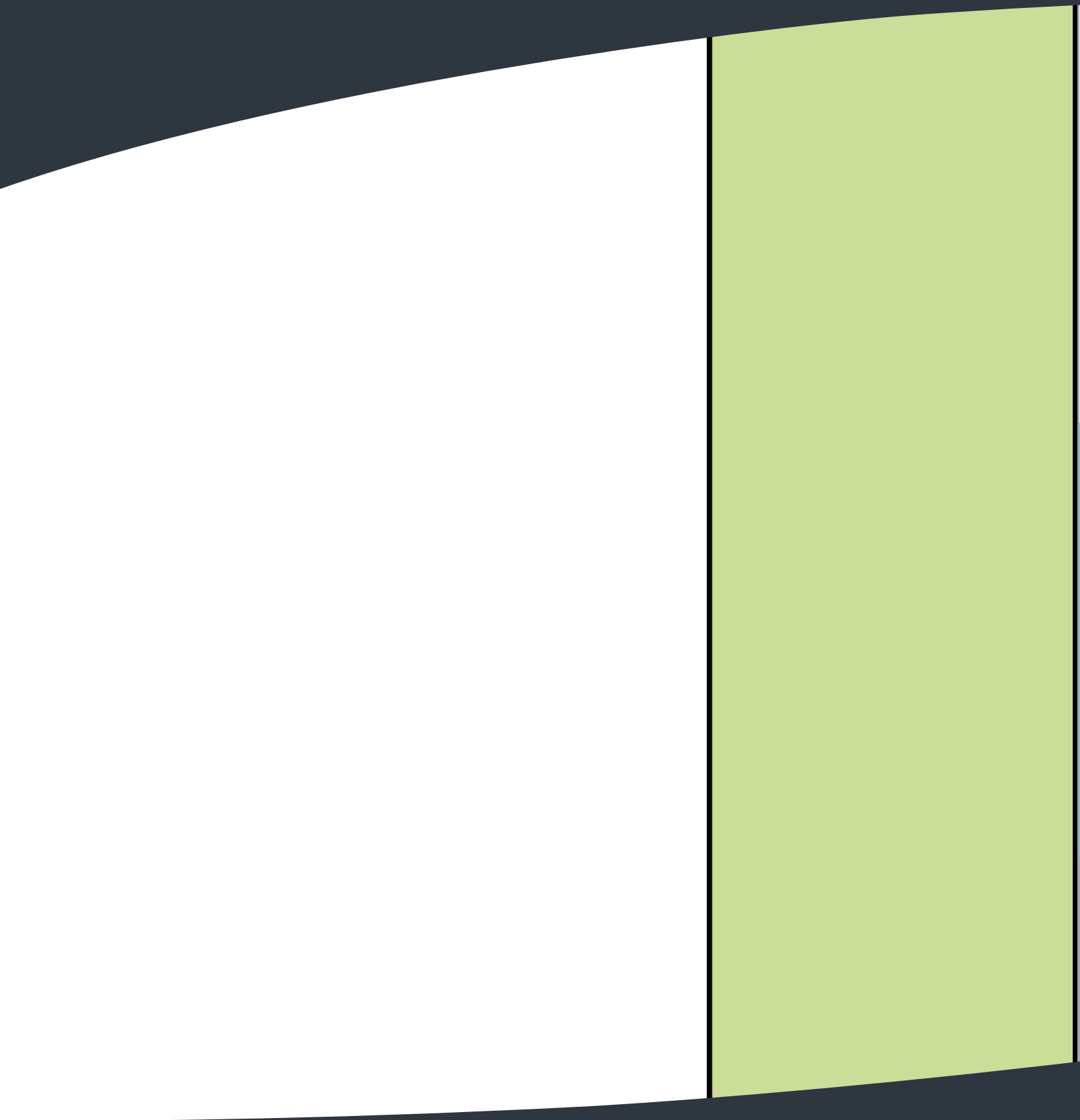
Movement	EB	WB	WB	NB	SB
Directions Served	TR	T	TR	R	R
Maximum Queue (ft)	37	139	121	30	92
Average Queue (ft)	1	16	14	10	37
95th Queue (ft)	12	74	53	33	73
Link Distance (ft)	220	240	240	140	132
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: S. Westnedge Ave (PB) & Dummy #2

Movement	WB
Directions Served	R
Maximum Queue (ft)	55
Average Queue (ft)	29
95th Queue (ft)	48
Link Distance (ft)	248
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 481



CITY OF PORTAGE PLANNING COMMISSION

Thursday, January 19, 2023

7:00 PM Portage

City Hall Council Chambers

The City of Portage Planning Commission meeting of January 19, 2023, was called to order by Chair Corradini at 7:00 p.m.

IN ATTENDANCE

- Eric Feldt, City Senior Planner
- Biqi Zhao, Deputy Director of Planning and Zoning
- Kelly Peterson, Director of Community Development
- Catherine Kaufman, City Attorney

ROLL CALL

Mr. Feldt called the role: Chairman Corradini (yes); Vice Chair Joshi (yes); Fries (yes); Pezzoli (excused); Baldwin (yes); Adams (yes); Youngs (excused); Kasper (yes); and Freiman (yes).

Vice Chair Joshi motioned to excuse Commissioners Pezzoli and Youngs; Commissioner Baldwin supported the motion. Motion carried 7-0.

APPROVAL OF MINUTES

Motion by Commissioner Baldwin, seconded by Vice Chair Joshi to approve the Planning Commission Meeting Minutes of December 15, 2022, as submitted. Motion carried 7-0.

PUBLIC HEARINGS

1. Tentative Plan and Rezoning Application (#22/23-7), from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road.

Mr. Feldt provided a presentation of the project called 'River Caddis', stating that the proposal consists of six three-story apartment buildings, one community building, two 'live/ work' buildings with apartments above, and various site amenities. Further, he indicated that the development would connect to city water and sewer, and private on-site stormwater system. The development showed three proposed access points: two along Shaver Road and one along W. Centre Avenue. The applicant is responsible for obtaining necessary agreements to use these three access points. Mr. Feldt presented the applicant's site drawings and illustrations and recent pictures of the site, and explained pertinent code sections. He indicated that the recommended traffic impact study was recently submitted but not fully reviewed by city staff in time for the Commission meeting, and the applicant would seek approvals from the State to develop within mapped wetlands and 100-year flood zone. Mr. Feldt stated that the applicant is seeking Commission approval for a lower parking requirement of 1.5 spaces/ unit instead of 2 spaces/ unit, and higher density from 7 units/ acre to 21.5 units/ acre.

Mr. Feldt stated that the proposed Tentative Plan and Rezoning were found to substantially meet applicable zoning regulations and are consistent with the City's Comprehensive Plan. Due to the pending review of the traffic study, he recommended two options for the Planning Commission consideration. Option 1 is that the Commission accepts the application and recommends approval of the Tentative Plan and Rezoning with conditions to City Council. Mr. Feldt stated that under this

option, if any substantial changes to the application are not in substantial compliance with the original Tentative Plan, the application shall be reviewed again by the Commission for Tentative Plan approval. Option 2 is that the Commission determines the application is incomplete and requests the submittal of a city staff's full review of the traffic impact study.

Applicant and property owner representative, John McGraw, 700 Mall Drive, Portage, MI, presented his company, other similar projects in Michigan and other states, and described the subject site and project. He explained the 'live/ work' element and floor plan and shared various factors in support of the project. Mr. McGraw indicated that the project fulfills housing needs in the Portage community and is supported by a market study.

The applicant's architect, Mike Corby, Integrated Architecture, explained the details of the site plan, indicated that the plan is a tentative drawing, and mentioned that the project helps address housing demand and Council's strategic goals. Mr. Corby explained that the project would achieve the desired number of housing units and building heights. He further explained that the project's parking plan reflects a similar lower parking demand at the State and national level. He generally described the underground stormwater system, indicated that they will do a soil testing, and that Hurley & Stewart will be part of the overall development team to assist in the design of the project. Mr. Corby described the architectural design of the proposed buildings in the back will have a residential feel, and the architectural design of the front buildings will feel more commercial.

Chair Corradini asked Mr. Corby about the 'live/ work' units.

Mr. Corby stated that these are becoming popular, listing examples in Grand Rapids. The 'work' portion is attractive to entrepreneurs, and other users such as architect's office.

Vice Chair Joshi asked Mr. Corby about 'live/ work' traffic counts. Mr. Corby answered they are typically lower than typical retail because the 'work' may not be open during general operating hours of a typical retail use.

Mr. Corby indicated that none of the residential units will be studios. It will be a mix of 1- and 2-bedroom units. Further, he stated that the smallest 1-bedroom unit will be 570 – 825 square feet; and the two-bedrooms between 950-1050 square feet. The 'work/ live' are 1,000 square feet. There is no wall between the 'work' and 'live' areas - designed for user flexibility.

Commissioner Fries asked why the development did not propose taller buildings and more units. Mr. McGraw stated that the 3-story building height was preferred to maximize cost effectiveness.

Commissioner Kasper asked about adding more parking and if parking could be provided inside any of the buildings. Mr. Corby indicated that it would increase costs and constructing carports/ garages would increase costs, too.

Chair Corradini expressed concerns about Fire Department activity nearby impacting future tenants of the development. Mr. McGraw indicated that they are aware of it and will address it later as the project moves to Final PD Plan.

Chair Corradini asked about the traffic impact study. Mr. Corby indicated that the road system was set up for a lot of traffic. The traffic engineer recommended minor changes to the traffic light timing. No substantial improvements to the streets were recommended.

Chair Corradini opened public hearing.

Public testimony as follows:

- Jonnie Richards, 2016 Woodbine Avenue, voiced concerns about how the overall project should be classified. Mr. Richards alleges that the zoning code does not specify 'live/ work' in the 'Planned Development' zoning district. He had additional concerns about perceived traffic. Further, he spoke against the proposed density increase and reduction of parking, and questioned the requested rezoning to 'Planned Development' instead of RM Multifamily. Mr. Richards further spoke about the need of housing affordability, area median income, and did not believe this project would provide affordable housing.

No other public testimony was received.

Commissioner Fries motioned to close public hearing; motion was supported by Commissioner Baldwin. Motion carried 7-0 upon a voice vote.

Vice Chair Joshi motioned to adjourn deliberation on the project to the 2/2/23 Planning Commission meeting to receive staff's full review comments on the traffic impact study, 2016 rental needs study, housing units added since 2016, and further Commission deliberation. Motion supported by Commissioner Freiman. Vice Chair Joshi asked Mr. Feldt if all materials can be provided in time for the Commission meeting on 2/2/23. Mr. Feldt said yes, but additional time to gather the requested information would be appreciated. Vice Chair Joshi then amended her motion to table deliberation to a future Commission meeting. The amendment was seconded by Commissioner Freiman. Motion carried 6-1 upon a voice vote, with Commissioner Adams voting no.

Commissioner Fries commented about supporting a lower parking requirement than what is required in the code due to overall lower parking demand. He also indicated support for higher density housing.

Commissioner Kasper asked if the draft Master Plan is addressing density and reclassifying concerns of density? Mr. Feldt stated yes but did not have details at this time.

Chair Corradini stated support for density due to limited land availability and support of taller buildings to help achieve high density levels. The higher density also supports the Council's Attainable Housing Plan.

Commissioner Adams stated support for the project due to low impact to neighbors, minimal impact to traffic, and lower parking requirement. He also indicated that people are now buying few cars, driving fewer miles, and that the city should plan for that lower automobile need. Mr. Adams indicated that the city should position the community for the future.

Chair Corradini spoke about pedestrian circulation in the area, car and pedestrian crashes at nearby street intersections, and asked Mr. Feldt if a bike path down Shaver Road is feasible to provide access to non-motorized users. Mr. Feldt indicated that the City Centre Plan will need to strategically plan for non-motorized users, examine street and railroad crossings for non-motorized users, and address overall non-motorized transportation in the draft Master Plan.

Kelly Peterson, Community Development Director, added to Mr. Feldt's comments by indicating that many streets in Portage have been designed with a vehicular priority, but recognized that these streets should be designed for all users. She further indicated a need for street intersection signaling to be designed for non-motorized users.

Chair Corradini remarked on the lack of continuous sidewalks along both sides of W. Centre Avenue, the residential neighborhoods along W. Centre Avenue that could use those sidewalks, and the nearby Central Portage Public Schools complex, which is within walking/ bicycle distance to nearby residential neighborhoods.

SITE/FINAL PLANS

None.

NEW BUSINESS

1. 2023 City Council Priorities
2. City of Portage Attainable Housing Plan

Director Peterson updated the Commission on City's Attainable Housing Plan of December 2022 and Council Priorities of January 10, 2023. These will lead future planning items for the Commission review and consideration. She listed planning items such as housing strategies, implementing the Lake District Plan, addressing future conditions of the Crossroads Mall area, zoning changes, form-based zoning, and mentioned a series of public updates, updating the Master Plan, public education with future changes.

Director Peterson indicated that at the upcoming Commission meeting on either the 2/2/23 or 2/16/23 the Commission would further deliberate on the River Caddis project and then enter a workshop to discuss upcoming ordinance updates on the items mentioned within the City Council's housing plan and priorities.

OLD BUSINESS

None.

STATEMENT OF CITIZENS

Jonny Richards, 2016 Woodbine Avenue, stated he did not see anything about the River Caddis project or other general support for electric vehicular charging stations.

STATEMENT OF COMMISSIONERS

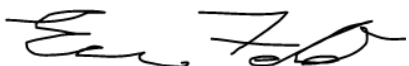
Vice Chair Joshi stated that the city should position itself now to plan for the future. She indicated a need to fully analyze the River Caddis project to ensure a comprehensive review and indicated support of the 'live/ work' scenario and lower parking requirement.

Chair Corradini thanked everyone for attendance. He asked if any Commissioner will be absent for the 2/2/23 and 2/16/23 Commission meetings. No Commissioners indicated their future absence.

ADJOURNMENT:

There being no further business to come before the Commission, Chair Corradini adjourned the meeting at 9:07 p.m.

Respectfully submitted,



Eric Feldt, AICP, CFM
City Senior Planner

**FIRST READING
CITY OF PORTAGE, MICHIGAN
NOTICE**

TO: THE RESIDENTS AND PROPERTY OWNERS OF THE CITY OF PORTAGE AND ALL OTHER INTERESTED PERSONS.

NOTICE IS HEREBY GIVEN, that an Ordinance to amend Article 4 (Zoning) of Chapter 42 of the Codified Ordinances of Portage, Michigan, was introduced for first reading at a regular meeting of the City Council held on _____, 2023, and that the Council will hold a public hearing on the proposed amendment at the Portage City Hall in said City on _____, 2023, at 7:00 p.m. or as soon thereafter as may be heard.

NOTICE IS FURTHER GIVEN that the proposed amendment to Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan reads as follows:

THE CITY OF PORTAGE ORDAINS:

That Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan, Official Zoning Map, be amended as follows:

<u>Street Address</u>	<u>Parcel ID Numbers</u>
412 W. Centre Avenue.	00016-740-E
7860 Shaver Road	06451-001-O

PART OF THE SE 1/4 OF SEC 16-3-11; Commencing at the South 1/4 Post of Section 16; thence North 89 degrees 58 minutes 40 seconds East 1493.62 feet; thence North 00 degrees 01 minutes 20 seconds West 459.88 feet to the point of beginning; thence North 00 degrees 00 minutes 25 seconds West 308 feet; thence North 24 degrees 37 minutes 11 seconds West 134.38 feet; thence North 17 degrees 48 minutes 06 seconds East 452.67 feet; thence South 89 degrees 55 minutes 18 seconds East 278 feet more-or-less to a reference point 'A' and the centerline of Portage Creek; thence Southeasterly along the centerline of Portage Creek 195 feet more-or-less to a point which is 189.62 feet South 49 DEG 9' 53" W OF SAID reference point 'A'; thence South 65 degrees 35 minutes 20 seconds East 503 feet; thence South 24 degrees 18 minutes 40 seconds West 279.04 feet; thence North 65 degrees 35 minutes 20 seconds West 10.78 feet; thence South 24 degrees 31 minutes 48 seconds West 309.29 feet; thence North 65 degrees 33 minutes 56 seconds West 113.72 feet; thence South 64 degrees 11 minutes 12 seconds West 102.52 feet; thence South 89 degrees 58 minutes 40 seconds West 226.09 feet to the point of beginning. approximately 9.47 Acres SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

PORTAGE CREEK LANDINGS CITY CENTRE UNIT #1SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

From Commercial Planned Development (CPD) District to Planned Development (PD) District.

PLEASE TAKE FURTHER NOTICE that if the owners of at least twenty percent (20%) of the area of land included in the proposed zoning change, or if the owners of at least twenty percent (20%) of the area of land included within an area extending outward one hundred feet (100') from any point on the boundary of the land included in the proposed change, excluding public right-of-way or other publicly owned land, file a written protest petition against the proposed amendment presented to the City Council before final legislative action on the amendment, a two-thirds vote of the City Council will be required to pass the amendment.

Dated: **APPROVED AS TO FORM**

DATE 5/14/2023

Catherine A. Kasper
CITY ATTORNEY

Erica Eklov, City Clerk

**ADOPTION OF ZONING ORDINANCE
CITY OF PORTAGE, MICHIGAN
NOTICE**

TO: THE RESIDENTS AND PROPERTY OWNERS OF THE CITY OF PORTAGE AND ALL OTHER INTERESTED PERSONS.

NOTICE IS HEREBY GIVEN, that an Ordinance to amend Article 4 (Zoning) of Chapter 42 of the Codified Ordinances of Portage, Michigan, was adopted by the City Council at a regular meeting held on the _____ day of _____, 2023, and will become effective _____, 2023.

NOTICE IS FURTHER GIVEN that Article 4 (Zoning) of Chapter 42, Land Development Regulations, of the Codified Ordinance of Portage, Michigan, has been amended as follows:

THE CITY OF PORTAGE ORDAINS:

That Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan, Official Zoning Map, be amended as follows:

Street Address
412 W. Centre Avenue.
7860 Shaver Road

Parcel ID Numbers
00016-740-E
06451-001-O

PART OF THE SE 1/4 OF SEC 16-3-11; Commencing at the South 1/4 Post of Section 16; thence North 89 degrees 58 minutes 40 seconds East 1493.62 feet; thence North 00 degrees 01 minutes 20 seconds West 459.88 feet to the point of beginning; thence North 00 degrees 00 minutes 25 seconds West 308 feet; thence North 24 degrees 37 minutes 11 seconds West 134.38 feet; thence North 17 degrees 48 minutes 06 seconds East 452.67 feet; thence South 89 degrees 55 minutes 18 seconds East 278 feet more-or-less to a reference point 'A' and the centerline of Portage Creek; thence Southeasterly along the centerline of Portage Creek 195 feet more-or-less to a point which is 189.62 feet South 49 DEG 9' 53" W OF SAID reference point 'A'; thence South 65 degrees 35 minutes 20 seconds East 503 feet; thence South 24 degrees 18 minutes 40 seconds West 279.04 feet; thence North 65 degrees 35 minutes 20 seconds West 10.78 feet; thence South 24 degrees 31 minutes 48 seconds West 309.29 feet; thence North 65 degrees 33 minutes 56 seconds West 113.72 feet; thence South 64 degrees 11 minutes 12 seconds West 102.52 feet; thence South 89 degrees 58 minutes 40 seconds West 226.09 feet to the point of beginning. approximately 9.47 Acres SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

PORTAGE CREEK LANDINGS CITY CENTRE UNIT #1SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

From Commercial Planned Development (CPD) District to Planned Development (PD) District.

PLEASE TAKE NOTICE that a copy of the Ordinance as amended may be purchased or inspected at City Hall on any business day except public and legal holidays from and after publication of this Notice from 8:00 a.m. to 5:00 p.m. local time. Further, a copy of a map showing the property rezoned is also available at the time and days noted above.

Dated: _____

Erica Eklov, City Clerk

APPROVED AS TO FORM

DATE 3-14-2023

Antoine P. Pappas

**AN ORDINANCE TO AMEND THE CODE OF ORDINANCES OF THE CITY OF
PORTAGE, MICHIGAN BY AMENDING ARTICLE 4 OF CHAPTER 42,
LAND DEVELOPMENT REGULATIONS OF THE CODIFIED ORDINANCES
OF PORTAGE, MICHIGAN**

THE CITY OF PORTAGE ORDAINS:

That Article 4 (Zoning) of Chapter 42, of the Codified Ordinances of Portage, Michigan, Official Zoning Map, be amended as follows:

<u>Street Address</u>	<u>Parcel ID Numbers</u>
412 W. Centre Avenue.	00016-740-E
7860 Shaver Road	06451-001-O

PART OF THE SE 1/4 OF SEC 16-3-11; Commencing at the South 1/4 Post of Section 16; thence North 89 degrees 58 minutes 40 seconds East 1493.62 feet; thence North 00 degrees 01 minutes 20 seconds West 459.88 feet to the point of beginning; thence North 00 degrees 00 minutes 25 seconds West 308 feet; thence North 24 degrees 37 minutes 11 seconds West 134.38 feet; thence North 17 degrees 48 minutes 06 seconds East 452.67 feet; thence South 89 degrees 55 minutes 18 seconds East 278 feet more-or-less to a reference point 'A' and the centerline of Portage Creek; thence Southeasterly along the centerline of Portage Creek 195 feet more-or-less to a point which is 189.62 feet South 49 DEG 9' 53" W OF SAID reference point 'A'; thence South 65 degrees 35 minutes 20 seconds East 503 feet; thence South 24 degrees 18 minutes 40 seconds West 279.04 feet; thence North 65 degrees 35 minutes 20 seconds West 10.78 feet; thence South 24 degrees 31 minutes 48 seconds West 309.29 feet; thence North 65 degrees 33 minutes 56 seconds West 113.72 feet; thence South 64 degrees 11 minutes 12 seconds West 102.52 feet; thence South 89 degrees 58 minutes 40 seconds West 226.09 feet to the point of beginning. approximately 9.47 Acres SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

PORTAGE CREEK LANDINGS CITY CENTRE UNIT #1SPLIT/COMBINED ON 05/18/2018 FROM 00016-740-C;

From Commercial Planned Development (CPD) District to Planned Development (PD) District.

FIRST READING:

SECOND READING:

EFFECTIVE DATE:

Patricia M. Randall, Mayor

STATE OF MICHIGAN)
) SS
COUNTY OF KALAMAZOO)

I do hereby certify that I am the duly appointed and acting City Clerk of the City of Portage and that the foregoing Ordinance was adopted by the City of Portage on the _____ day of _____, 2023.

Erica Eklov, City Clerk

Approved as to Form:

Date: 3/14/2023

By: Catherine Kaufman
City Attorney

CITY OF PORTAGE PLANNING COMMISSION

**Thursday, March 2, 2023
7:00 PM Portage
Portage City Hall Council Chambers**

The City of Portage Planning Commission meeting of March 2, 2023, was called to order by Chair Corradini at 7:00 p.m.

IN ATTENDANCE

- Biqi Zhao, Deputy Director of Planning and Zoning
- Jonathon Hallberg, Interim Director of Community Development
- Catherine Kaufman, City Attorney

ROLL CALL

Ms. Zhao called the roll: Chairman Corradini (yes); Vice Chair Joshi (yes); Fries (yes); Pezzoli (no); Baldwin (yes); Adams (yes); Youngs (yes); Kasper (yes); and Freiman (yes).

Motion by Commissioner Youngs, seconded by Commissioner Baldwin to excuse Commissioner Pezzoli. Motion carried 8-0.

APPROVAL OF MINUTES

1. Minutes dated February 16, 2023.

Motion by Commissioner Fries, seconded by Vice Chair Joshi to approve the Planning Commission Meeting Minutes of February 16, 2023, as submitted. Motion carried 8-0.

PUBLIC HEARINGS

1. Rezoning application No. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attached Residential for future duplex developments.

Ms. Zhao presented and summarized the proposed rezoning application, stated various elements of the subject site and neighborhood, showed various pictures of the site, and a survey of a recently-approved land division of the subject site. She showed a table indicating differences between the existing R-1B district and proposed R-1T district. Also, she showed required R-1T development standards. Ms. Zhao indicated that the proposed rezoning requires Planning Commission recommendation and City Council vote, both at public hearings. Ms. Zhao presented staff's analysis indicating consistency with the Comprehensive Plan, and alignment with the Council's goals of attracting residential development. Ms. Zhao stated that the City has not received any public comments on this proposal until the day of this meeting (3/2/23). She concluded with the recommended action: "If no additional public comment is requested and the Commission is supportive of the proposed rezone request, staff advises the Planning Commission to recommend to City Council the approval of rezoning application no. 22/23-8 to R-1T Attachment Residential to expand residential development opportunities."

The applicant, Mike West, presented and summarized the overall size and shape of the lot; indicated that the subject site has been divided; indicated that there are multiple utility leads serving the property from Lovers Lane. He stated a conceptual development of a future duplex with a density of 1.8 units per acre, less than the maximum density of R-1T district. Mr. West addressed that he believes the proposal is compatible with the City's Comprehensive Plan; it is adjacent to other similar attached housing proposal; and requests Planning Commission support.

Chair Corradini opened public hearing. Public testimonies are as follows:

- 1) Mike Ashby, 7416 Lovers Lane. Indicated concerns about size of lot to accommodate future housing, preservation of natural vegetation for wildlife, and opposes the rezoning.
- 2) George Gerth, 7426 Lovers Lane. Indicated concerns about perceived growth impact on open space around his property, concerns about lack of site maintenance of subject site, and opposes the rezoning.
- 3) Colleen Poot, 7402 Lovers Lane. Indicated concerns about aesthetics of street corner with future development, concerns about perceived increased traffic and headlight impact from the rezoning, concerns about perceived impact to wildlife in the area, concerns about perceived future redevelopment creep in the neighborhood, and opposes the rezoning.

Motion by Commissioner Adams, seconded by Vice Chair Joshi to close public hearing. Motion carried 8-0.

Chair Corradini clarified that the Planning Commission's action on the rezoning is a recommendation. And the rezoning proposal will be forwarded to the City Council where another public hearing will be provided, and the Council will vote on the rezoning proposal.

Motion by Vice Chair Joshi, seconded by Commissioner Fries to recommend to City Council the approval of rezoning application no. 22/23-8 to rezone 7438 Lovers Lane from R-1B One-Family Residential to R-1T Attachment Residential to expand residential development opportunities. Ms. Zhao called the roll for the motion: Chairman Corradini (yes); Vice Chair Joshi (yes); Fries (yes); Pezzoli (no); Baldwin (yes); Adams (yes); Youngs (yes); Kasper (yes); and Freiman (yes). Motion carried 8-0.

2. An additional accessory building space for a proposed pole barn at 10042 Terry Ln (parcel no: 04741-041-A) and 520 Bacon Ave. (parcel no: 04740-001-B).

Ms. Zhao presented and summarized the proposal, stated various elements of the subject site and neighborhood, showed various pictures of the site, provided a table of all existing and proposed buildings, and summarized the total existing accessory building space and proposed total accessory building space. She explained the applicable zoning code regulation for Planning Commission consideration. Ms. Zhao provided staff's analysis of the replacement of an existing accessory detached building with a proposed pole barn. She also stated that the project is consistent with the intent of the underlying zoning district and applicable sections of Comprehensive Plan. Ms. Zhao indicated that the City has received two recent public comments supporting the project, as well as the applicant's submittal of adjacent property owners' signatures of support. She concluded with the recommended action "If no additional public comment is requested and the Commission is supportive of the proposed project, staff recommends Planning Commission approval of the additional accessory building space of 1,799 square feet at 10042 Terry Lane and 520 Bacon Avenue with the following condition: Lots of 10042 Terry Lane and 520 Bacon Avenue be combined."

The applicant, Garth Whitehill, 10043 Terry Lane, presented and summarized the overall project, and stated that the project will help keep personal belongings inside a building, and spoke with adjacent neighbors about the project. He indicated that the lot combination application has been submitted to the City.

Commission Fries indicated support to streamline projects similar to this.

Chair Corradini supported the applicant's effort in contacting neighbors in the area.

Chair Corradini opened public hearing. No public hearing received. Vice Joshi made the motion, and Commissioner Baldwin supported a motion to close public hearing. Motion carried 8-0.

Commissioner Fries motioned, supported by Commissioner Adams approval of the additional accessory building space of 1,799 square feet at 10042 Terry Lane and 520 Bacon Avenue with the following condition: Lots of 10042 Terry Lane and 520 Bacon Avenue be combined. Motion carried 8-0.

SITE/FINAL PLANS

None.

NEW BUSINESS

None.

OLD BUSINESS

1. A Tentative Plan and Rezoning Application (#22/23-7), from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road.

Ms. Zhao stated that the project was continued from the January 19, 2023 Planning Commission meeting. She summarized the project site layout, conceptual building elevations, and overall number of dwelling units. Ms. Zhao explained applicable zoning regulations of the 'Planned Development' standards, applicable Comprehensive Plan elements, and relevant City Council's housing goals. She addressed the applicant's additional project request of seeking a lower parking plan and higher density. Ms. Zhao showed a chart of other proposed, existing high density residential developments throughout Portage. She addressed the Commission's pending items from the January 19, 2023, meeting and pending traffic study review and recommendation; indicating that the traffic study has been accepted by the City; and that no significant project changes were recommended. Ms. Zhao concluded with the recommended action "Staff advises the Planning Commission to recommend to City Council the approval of the Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road with the following conditions:

- 1) a written confirmation of rights to use the condominium common parcels for potential parking and access, which shall be submitted to the city prior to the Final PD Site Plan review and approval.
- 2) if the proposed parking on the common area is not allowed, to approve the submitted alternative plan for contingency parking.
- 3) the proposed 'live/ work' units shall be consistent with the requirements of Building Code Section 419 'Live/ Work Units' and Zoning Code Sec. 42-137 'Work/ Live Accommodations'.
- 4) An updated site plan shall be submitted for Final PD Site Plan review showing the northern driveway along Shaver Road be designed with a dedicated left-turn and right-turn egress lanes."

Commissioner Freiman expressed concerns about the development impacting wetlands and perceived impacts from the adjacent Fire Department and its operational uses. He did state support of the development, including creating a need for housing, the development being located close to amenities, and having walkable, bikeable elements.

The applicant (attended virtually), John McGraw, stated that a wetlands delineation was established in 2006 which showed no mapped wetlands within the developing area. However, current wetland map shows an increase in wetland area which stretches in the area of proposed buildings. Mr. McGraw indicated this development plan is tentative, and discussions with the State Environmental Great Lakes and Energy Department (EGLE) are underway.

Chair Corradini stated concerns about traffic increase and turning movements at access points along W. Centre Avenue and Shaver Road; indicated concerns about reducing parking allowance; stated concerns about impact to the mapped floodplain and raising flood waters encroaching onto the subject site; indicated concerns about the adjacent Fire Department operations and access impacting the proposed development and vice versa; and stated concerns about the project's considerable higher density than what is allowed under the 'Planned Development' regulation and its effect on traffic levels. He also stated the City should examine a comprehensive pedestrian network for the underlying City Centre Plan; needed sidewalk improvements along Centre Street; and add public improvements to the City's Capital Improvement Program (CIP).

Commissioner Baldwin expressed concerns about the Fire Department operations impacting the development; concerns about internal traffic circulation between the proposed development and existing development in the neighborhood.

Commissioner Kasper stated that she shares concerns about parking and desired more parking to be provided but indicating that the development would meet the needs of the area.

Vice Chair Joshi stated that she is not fully convinced of the walkability of the site and had concerns about flooding.

Commissioner Youngs expressed concerns about the high density, parking, and access points.

Commissioner Fries stated that other development in the greater neighborhood were required to install sidewalks and shared concerns about needing a plan for addressing pedestrian network in the area.

Commissioner Fries motioned, seconded by Commissioner Adams the Planning Commission to recommend to City Council the approval of the Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road with the following conditions:

- 1) a written confirmation of rights to use the condominium common parcels for potential parking and access, which shall be submitted to the city prior to the Final PD Site Plan review and approval.
- 2) if the proposed parking on the common area is not allowed, to approve the submitted alternative plan for contingency parking.
- 3) the proposed 'live/ work' units shall be consistent with the requirements of Building Code Section 419 'Live/ Work Units' and Zoning Code Sec. 42-137 'Work/ Live Accommodations'.
- 4) An updated site plan shall be submitted for Final PD Site Plan review showing the northern driveway along Shaver Road be designed with a dedicated left-turn and right-turn egress lanes.

Motion carried 8-0

STATEMENT OF CITIZENS

George Gerth recalled historic road conditions in Portage and land ownership around 7438 Lovers Lane.

STATEMENT OF COMMISSIONERS/ STAFF

Commissioner Freiman expressed sympathetic concerns with public testimony regarding the rezoning of 7438 Lovers Lane on the agenda, stated the rezoning process and the purpose of the Comprehensive Plan, and indicated a growing demand for housing for the community. He also stated that many wildlife and trees are located on private property and can be development as allowed under City processes. Further, he indicated that those natural settings could be generally preserved if purchased for non-development purposes.

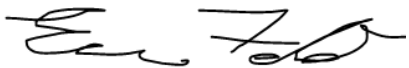
Chair Corradini commended local and regional staff response during the recent ice storm.

Ms. Zhao reminded the public and Commission about the City's Master Plan visioning workshop on Monday, March 20th at 5:30pm at the Portage Zhang Senior Center.

ADJOURNMENT

There being no further business to come before the Commission, Chair Corradini adjourned the meeting at 8:44 p.m.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Eric Feldt".

Eric Feldt, AICP, CFM
City Senior Planner

TO: Honorable Mayor and City Council

FROM: City of Portage Planning Commission

DATE: March 16, 2023

SUBJECT: Rezoning and Tentative Plan Application # 22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road.

At the January 19, 2023, the Planning Commission discussed Tentative Plan and Rezoning Application #22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road. The applicant representative, John McGraw, River Caddis Development, LLC, and the applicant's architect, Mike Corby, Integrated Architecture, were present to support the proposed application and explain the project details. One member of the public provided testimony and expressed opposition to the project due to perceived concerns about the impacts on traffic. He further spoke against density increase and reduction of parking, questioned the requested rezoning to Planned Development instead of RM Multifamily, and questioned the proposed apartments affordability. The Planning Commission determined no further discussion was needed and voted to close the public hearing.

After careful consideration, the Planning Commission voted 6-1 to adjourn deliberation on the project to a future Planning Commission meeting to receive staff's full review comments on the traffic impact study, 2016 rental needs study, determination of housing units added since 2016, and further Commission deliberation.

At the March 2, 2023 meeting, the Planning Commission continued the deliberation on Rezoning and Tentative Plan Application # 22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development. The applicant, John McGraw, River Caddis Development, LLC, and the applicant's architect, Mike Corby, Integrated Architecture, attended virtually to support the proposed rezoning and tentative plan, and answered the Commission's questions.

After careful consideration, the Planning Commission voted 8-0 (unanimously) to recommend to City Council the approval of the Rezoning and Tentative Plan Application # 22/23-7, from Commercial Planned Development (CPD) to Planned Development (PD) for a proposed mixed-use development at 412 W. Centre Avenue and 7860 Shaver Road with the following conditions:

1. A written confirmation of rights to use the condominium common parcels for potential parking and access, which shall be submitted to the City prior to the Final PD Site Plan review and approval.
2. If the proposed parking on the common area is not allowed, approve the submitted alternative plan for contingency parking.



Department of Community Development

3. The proposed 'live/work' units shall be consistent with the requirements of Building Code Section 419 'Live/ Work Units' and Zoning Code Sec. 42-137 'Work/ Live Accommodations'.
4. An updated site plan should be submitted for Final PD Site Plan review showing the northern driveway along Shaver Road as being designed with dedicated left-turn and right-turn egress lanes.

Sincerely,

CITY OF PORTAGE PLANNING COMMISSION

Dan Corradini
Chairman

Attachments: January 19, 2023 Planning Commission meeting minutes
March 2, 2023 Planning Commission meeting minutes

TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: Computer Replacement

SUPPORTING PERSONNEL: Devin Mackinder, Director of Technology Services

ACTION RECOMMENDED: Approve the purchase of computing devices, monitors and accessories from CDW-G under the Michigan Master Computing MiDEAL competitive bid process in the amount of \$121,435.27 and authorize the City Manager to execute all documents related to this action.

The Technology Services Department maintains an industry-standard replacement schedule of three-five years for all city computing devices, monitors, and accessory equipment in order to avoid repair costs, lost productivity, and incompatibility with modern software applications. The recommended purchase represents the replacement of approximately one-third of the city's computing equipment. If approved by City Council, the computing equipment will be purchased under the Michigan Master Computing-MiDEAL competitive bid process - Contract (071B6600110).

It is recommended that City Council approve the purchase of computing devices, monitors, and accessories from CDW-G under the Michigan Master Computing MiDEAL competitive bid process in the amount of \$121,435.27 and authorize the City Manager to execute all documents related to this action.

FUNDING: Funds are available and budgeted for this planned expense.

Attachments: 1. CDW-G Quote



Thank you for choosing CDW. We have received your quote.

Hardware

Software

Services

IT Solutions

Brands

Research Hub

Review and Complete Purchase

MAURICE HUDSON,

Thank you for considering CDW•G for your technology needs. The details of your quote are below. **If you are an eProcurement or single sign on customer, please log into your system to access the CDW site.** You can search for your quote to retrieve and transfer back into your system for processing.

For all other customers, click below to convert your quote to an order.

Convert Quote to Order

QUOTE #	QUOTE DATE	QUOTE REFERENCE	CUSTOMER #	GRAND TOTAL
NDRZ592	1/10/2023	LVO REFRESH	6652704	\$121,435.27

QUOTE DETAILS				
ITEM	QTY	CDW#	UNIT PRICE	EXT. PRICE
LVO T16 I7-1255U W10P MC00089766 Mfg. Part#: 21BWS37J00-MC00089766 Contract: Michigan Master Computing-MiDEAL (071B6600110)	20	7246817	\$1,354.10	\$27,082.00
Lenovo ThinkPad Universal USB-C Dock - docking station - USB-C - HDMI, 2 x Mfg. Part#: 40AY0090US Contract: Michigan Master Computing-MiDEAL (071B6600110)	1	6536318	\$192.50	\$192.50
LVO X12 I7-1160G7 W11P MC00089766 Mfg. Part#: 20UVS5FU00-MC00089766 Contract: Michigan Master Computing-MiDEAL (071B6600110)	1	7246824	\$1,751.20	\$1,751.20
LVO P360 I7-12700K W10P MC00089766 Mfg. Part#: 30FNS55Q00-MC00089766 Contract: Michigan Master Computing-MiDEAL (071B6600110)	1	7246828	\$2,740.10	\$2,740.10
LVO P360 I5-12600K W10P MC00089766 Mfg. Part#: 30FNS55P00-MC00089766 Contract: Michigan Master Computing-MiDEAL (071B6600110)	1	7246832	\$2,528.90	\$2,528.90
LVO P360 I7-12700 W10P MC00089766 Mfg. Part#: 30G2S17P00-MC00089766 Contract: Michigan Master Computing-MiDEAL (071B6600110)	9	7246837	\$1,793.00	\$16,137.00
Lenovo ThinkVision T27i-30 - LED monitor - Full HD (1080p) - 27" Mfg. Part#: 63A4MAR1US Contract: Michigan Master Computing-MiDEAL (071B6600110)	2	7133095	\$224.51	\$449.02
Lenovo ThinkVision T24i-20 - LED monitor - Full HD (1080p) - 23.8"	5	6058764	\$203.06	\$1,015.30

QUOTE DETAILS (CONT.)

Mfg. Part#: 61F7MAR1US

Contract: Michigan Master Computing-MiDEAL (071B6600110)

[LVO M70S I7-12700 W10P MC00089766](#)

60

7246841

\$1,127.50

\$67,650.00

Mfg. Part#: 11T7S3NY00-MC00089766

Contract: Michigan Master Computing-MiDEAL (071B6600110)

[LVO X1YOGA I7-1255U W10P MC00089766](#)

1

7246845

\$1,889.25

\$1,889.25

Mfg. Part#: 21CES41G00-MC00089766

Contract: Michigan Master Computing-MiDEAL (071B6600110)

SUBTOTAL \$121,435.27**SHIPPING** \$0.00**SALES TAX** \$0.00**GRAND TOTAL** **\$121,435.27****PURCHASER BILLING INFO****Billing Address:**CITY OF PORTAGE
FINANCE DEPARTMENT
7900 S WESTNEDGE AVE
PORTAGE, MI 49002-5117**Phone:** (269) 324-9262**Payment Terms:** Net 30 Days-Govt State/Local**DELIVER TO****Shipping Address:**CITY OF PORTAGE
FINANCE DEPARTMENT
7900 S WESTNEDGE AVE
PORTAGE, MI 49002-5117**Phone:** (269) 324-9262**Shipping Method:** UPS Ground (1- 2 day)**Please remit payments to:**CDW Government
75 Remittance Drive
Suite 1515
Chicago, IL 60675-1515**Sales Contact Info****Dave Engmark** | 800.808.4239 | davieng@cdwg.com**LEASE OPTIONS**

FMV TOTAL	FMV LEASE OPTION	BO TOTAL	BO LEASE OPTION
\$121,435.27	\$3,222.89/Month	\$121,435.27	\$3,731.71/Month

Monthly payment based on 36 month lease. Other terms and options are available. Contact your Account Manager for details. Payment quoted is subject to change.

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- Bundle Costs. You can combine hardware, software, and services into a single transaction and pay for your software licenses over time! We know your challenges and understand the need for flexibility.

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TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: Substantial Amendment to the CDBG Program FY2021-2

SUPPORTING PERSONNEL: Jonathon Hallberg, Interim Director of Community Development

ACTION RECOMMENDED: Approve the FY 2021-22 Annual Action Plan Substantial Amendment and allocate \$110,341 to Housing Resources, Inc., to support housing stabilization due to COVID-19 for eviction prevention and rapid rehousing, and to allow families to remain in their homes.

The Human Services Board met regarding the allocation of the \$237,041 CDBG-CV3 grant received from the U.S. Department of Housing and Urban Development (HUD) to prepare for, respond to, and prevent the spread of coronavirus. This is the second CDBG-CV grant to be awarded to the city. The first grant of \$130,474 was awarded to two subrecipients by the City of Portage: Housing Resources, Inc., and Portage Community Center. The primary purpose of the grant funds is to benefit Portage residents, emphasizing low and moderate-income persons who have been adversely affected by the COVID-19 pandemic.

In accordance with HUD requirements, a Substantial Plan Amendment to the CDBG Program FY2021-22 Annual Action Plan is required. The Human Services Board conducted a public hearing on the Substantial Plan on March 2, 2023. No public comments were received during the 30-day period. As a result, the Human Services Board recommends that City Council approve the FY 2021-22 Annual Action Plan Substantial Amendment and allocate \$110,341 to Housing Resources, Inc., to support housing stabilization due to COVID-19 for eviction prevention and rapid rehousing, and to allow families to remain in their homes.

FUNDING: Not Applicable

Attachments:

1. HSB memo to Council - CDBG Substantial Amendment
2. Substantial Amendment Summary_Portage_CV_Reallocation_Final



TO: Honorable Mayor and City Council

FROM: Human Services Board

DATE: March 8, 2023

SUBJECT: Substantial Amendment to the CDBG Program FY2021-22 Annual Action Plan

On July 22, 2021, the Human Services Board met regarding allocation of the \$237,041 CDBG-CV3 grant received from the U.S. Department of Housing and Urban Development (HUD) to prepare for, respond to and prevent the spread of the corona virus. This is the second CDBG-CV grant to be awarded to the city. The first grant of \$130,474 was awarded to two subrecipients by the City of Portage; Housing Resources, Inc. and the Portage Community Center. The primary purpose of the grant funds is to benefit Portage residents, with emphasis towards low- and moderate-income persons who have been adversely affected by the COVID-19 pandemic.

In accordance with HUD requirements, a Substantial Plan Amendment to the CDBG Program FY2021-22 Annual Action Plan is required. The Human Services Board conducted a public hearing on the Substantial Plan Amendment on March 2, 2023, following a 30-day comment period from January 26, 2023 through February 25, 2023. No public comment was received during the 30-day period. As a result, the Board is recommending that City Council approve the FY2021-22 Annual Action Plan Substantial Amendment and that \$110,341 be allocated to Housing Resources, Inc. to support housing stabilization due to COVID-19 for eviction prevention and rapid rehousing, and to allow families to remain in their homes.

If the Council has any questions regarding this matter, please contact me at your earliest convenience.

Sincerely,

A handwritten signature in black ink that reads "Brooke Kolodzieczyk". The signature is fluid and cursive, with the first name "Brooke" and last name "Kolodzieczyk" clearly legible.

Brooke Kolodzieczyk
Chairperson



Kalamazoo Gazette

LEGAL AFFIDAVIT

AD#: 0010560756

Total

\$348.25

State of Michigan, ss
County of Kalamazoo)

Nancy Block being duly sworn, deposes that he/she is principal clerk of MLive Media Group; that Kalamazoo Gazette is a public newspaper published in the city of Kalamazoo, with general circulation in Kalamazoo county, and this notice is an accurate and true copy of this notice as printed in said newspaper, was printed and published in the regular edition and issue of said newspaper on the following date(s):

Kalamazoo Gazette 01/29/2023

RECEIVED

FEB 07 2023

PORTAGE
CITY CLERK

Nancy Block
Principal Clerk of the Publisher

Sworn to and subscribed before me this 30th day of January 2023

Teasha R Payne
Notary Public

TEASHA R. PAYNE
NOTARY PUBLIC, STATE OF MI
COUNTY OF MECOSTA
COMMISSION EXP FEB 24 2026
ACTING IN COUNTY OF Portage



NOTICE OF PUBLIC HEARING

The City of Portage Human Services Board will hold a public hearing on Thursday, March 2, 2023 at 5:30 p.m. in Conference Room 2, Portage City Hall, 7900 South Westnedge Avenue, Portage, Michigan to discuss comments on an amendment to the Community Development Block Grant (CDBG) Program FY 2021-22 Annual Action Plan. The amendment proposes to reallocate \$110,341 of the \$237,041 CDBG-CV3 Grant received from the U.S. Department of Housing and Urban Development. This allocation was authorized by the Coronavirus Aid, Relief and Economic Security Act (CARES Act) to prevent, prepare for and respond to the COVID-19 pandemic. The reallocation amount will move \$107,041 from housing, including rehabilitation, and \$3,300 from grant administration, to support housing stabilization due to COVID such as eviction prevention and rapid rehousing. This will allow families to remain in their homes. The draft document is available for review at the following locations:

- Department of Community Development, City of Portage, 7900 South Westnedge Avenue, Portage, MI 49002
- Portage District Library, 300 Library Lane, Portage, MI 49002
- Portage Community Center, 325 East Centre Avenue, Portage, MI 49002
- City of Portage web site (<http://www.portagemi.gov/180/Human-Services-Board>)

All interested persons are encouraged to attend. Comments can be submitted in writing on or before February 25, 2023 to the City of Portage, Department of Community Development, for discussion at the public hearing. Subsequent to the public hearing, a 30-day public comment period will be provided beginning January 26, 2023 and ending February 25, 2023. Citizens desiring additional information should contact the City of Portage Department of Community Development, (269) 329-4477 for additional information.

Department of Community Development
Kelly Peterson, Director

Dated: January 24, 2023

10560756-01



NOTICE OF PUBLIC HEARING

The City of Portage Human Services Board will hold a public hearing on Thursday, March 2, 2023 at 5:30 p.m. in Conference Room 2, Portage City Hall, 7900 South Westnedge Avenue, Portage, Michigan to discuss comments on an amendment to the Community Development Block Grant (CDBG) Program FY 2021-22 Annual Action Plan. The amendment proposes to reallocate \$110,341 of the \$237,041 CDBG-CV3 Grant received from the U.S. Department of Housing and Urban Development. This allocation was authorized by the Coronavirus Aid, Relief and Economic Security Act (CARES Act) to prevent, prepare for and respond to the COVID-19 pandemic. The reallocation amount will move \$107,041 from housing, including rehabilitation, and \$3,300 from grant administration, to support housing stabilization due to COVID such as eviction prevention and rapid rehousing. This will allow families to remain in their homes. The draft document is available for review at the following locations:

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Department of Community Development
Kelly Peterson, Director

Dated: January 24, 2023

10560756-01

CITY OF PORTAGE HUMAN SERVICES BOARD

Minutes of the Meeting – March 2, 2023

5:30 p.m. Conference Room 1

CALL TO ORDER: The City of Portage Special Human Services Board meeting of March 2, 2023, was called to order by Chair Brooke Kolodzieczyk at 5:34 p.m. in Conference Room 1, Portage City Hall, 7900 S. Westnedge Avenue, Portage MI.

MEMBERS PRESENT: Chair Brooke Kolodzieczyk, Vice Chair Jihan Young, Effie Kokkinos, John Dillworth, Justin Phan, Chelsea Huber, and Sue Beasley.

MEMBERS ABSENT: Bridget Lane, Monica Lloyd

OTHERS PRESENT: Ludim Torres, Chris Buckley, Marilyn Storch & Don Jones

STAFF PRESENT: Tina Perry, Neighborhood & Housing Specialist

APPROVAL OF MINUTES: The Minutes of February 2, 2023 were approved by a motion made by Jihan Young and supported by Effie Kokkinos. The motion was unanimously approved, 7-0.

NEW BUSINESS:

CDBG Public Hearing for Substantial Plan Amendment in the CDBG-CV program. An amendment in the FY2021-22 Annual Action Plan proposes to reallocate \$110,341 of the \$237,041 CDBG-CV3 grant received from the U.S. Department of Housing & Urban Development. This reallocation will support timely spending that prevents, prepares for, and responds to the COVID-19 pandemic. Housing Resources Inc. will receive the reallocated funding to support housing stabilization due to COVID, such as eviction prevention, rapid re-housing, and utility assistance.

Chairperson Brooke Kolodzieczyk noted no written comments have been received and requested a motion to OPEN the public hearing to any Public Comments. Jihan Young made a motion to Open the public hearing, Effie Kokkinos supported the motion, and it was supported the motion and it unanimously passed 7-0. No public comments were received. Chairperson Brooke Kolodzieczyk requested a motion to Close the Public Hearing to receive comments about the reallocation of CDBG CV funds. John Dillworth made a motion to Close the public hearing, Chelsea Huber supported the motion and it unanimously passed 7-0.

Fair Housing month. A Proclamation is being forward to City Council at their March 21, 2023 meeting to declare April, 2023 a Fair Housing Month. Perry requested HSB volunteers may want to attend and read the proclamation. Vice Chairperson Jihan Young successfully did this on her own in the past and supported the “more the merrier” support of this request inviting all HSB that are willing to attend to read a portion of the Proclamation at the meeting.

In support of April being Fair Housing Month, a representative from the Center of Fair Housing of Southwest Michigan is attending the April 6 regular HSB meeting to provide an update of current affairs of Fair Housing.

OLD BUSINESS:

Human/Public Services funding process subcommittee: Chairperson Brooke Kolodzieczyk proposed the HSB utilize the quieter spring HSB meeting months to review the human service application process, application, and scoring, in preparation of the next cycle beginning in November.

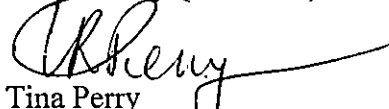
Regular meeting dates and times, beginning in May, 2023 where no formal business is needed, will be cancelled, and utilized for members to conduct their review.

STATEMENT OF CITIZENS:

Chairperson Brooke asked if there were any citizen comments. Don Jones indicated he and Marilyn work with the Prince of Peace Lutheran Church programs that they offer to the public including Portage citizens. They are entertaining submission of an application to the HSB for funding support. Don had met with staff Tina Perry to receive an overview, the process and information including the application previously used. They have with some clarification questions. HSB commented their questions can be forwarded to Tina Perry to forward to the HSB to review during their upcoming review and preparation of the FY24-25 application with the HAB for discussion. Chris Buckley with Portage Community Center commented their origination is seeing a huge increase in the food pantry due to the reduction of SNAP food benefits. These benefits were increased due to COVID and are now being reduced causing unusually higher usage compared to previous years. PCC has the VITA program currently operating at PCC on Fridays for income tax assistance. PCC is well into their annual fundraising planning and things are going well there. Chris requested the Human Services funding application format be changed to one that can more easily be fillable. John Dillworth suggests surveying other organizations' formats.

ADJOURN: Motion to adjourn was made by John Dillworth, second by Effie Kokkinos and unanimously supported. 7-0.

Respectfully Submitted,



Tina Perry
Neighborhood and Housing Specialist
Community Development, City of Portage

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Introduction

The FY 2020-21 Annual Action Plan, Strategy for Housing and Community Development Needs, includes activities and programs to fulfill identified needs outlined in the 2016-2020 Consolidated Plan. The five-year Consolidated Plan and the Annual Action Plan elements are required in order to apply for and receive Community Development Block Grant (CDBG) entitlement program funds from the U.S. Department of Housing and Urban Development (HUD), which have been awarded to the City since the mid-1970s.

The FY 2020-21 Annual Action Plan was approved by City Council on May 12, 2020, and subsequently submitted to the Detroit HUD Field Office on May 9, 2020 for review and approval.

In response to the Coronavirus Pandemic (COVID-19) the United States Department of Housing and Urban Development (HUD) notified the City of Portage that it had been allocated \$130,474 of Community Development Block Grant Program –Coronavirus Response funds (CDBG-CV1) to be used to prevent, prepare for, and respond to COVID-19. This allocation was authorized by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), Public Law 116-136, which was signed by President Trump on March 27, 2020, to respond to the growing effects of this historic public health crisis. Then in July of 2021, the City of Portage amended the FY 2020-21 Annual Action Plan to incorporate an additional allocation of Community Development Block Grant Program – Coronavirus Response funds (CDBG-CV3) in the amount of \$237,041.

The 2020-21 Annual Action Plan was substantially amended in October 2020 due to the first tranche of CDBG-CV funding. In July 2021, the 2020-2021 Annual Action Plan was amended for a second time due to the third tranche of CDBG-CV funding.

The Activities and expenditures of CDBG funds must meet three national objectives:

1. Benefit low- and/or moderate-income persons,
2. Aid in the prevention or elimination of blight, and
3. Meet urgent community development needs.

In order to meet these national objectives, the approved FY 2020-21 Annual Action Plan includes five inter-related activities pertaining to three goals to be carried out during the program year. The table below lists the goals, the program activity, an activity description, and the planned objectives and outcomes.

Goal Name	Category	Geographic Area	Needs Addressed	Funding	Goal Outcome Indicator
Affordable Owner Housing	Affordable Housing	City-wide	Affordable Owner Housing	CDBG: \$192,896	-Homeowner Housing Rehabilitation: 12 Household/ Housing Units -Direct Financial Assistance to Homebuyers: 3 Households Assisted
Neighborhood Improvement	Non-Housing Community Development	Low- and Moderate-Income Areas	Neighborhood Improvement	CDBG: \$64,366	Housing Code Enforcement/Foreclosed Property Care: 350 Household/Housing Units
Public Services	Homeless, Non-Homeless Special Needs	City-wide	Public Services	CDBG: \$44,618	Public Service Activities for Low/Moderate Income Housing Benefit: 4,000 Households Assisted

The approved FY 2020-21 Annual Action Plan also allocated \$44,914 towards Grant Planning/Administration, which includes preparation of HUD-required plans and reports, Environmental Review, Fair Housing education and enforcement activities, and an update of the 2016-2020 Consolidated Plan.

Proposed 3rd Substantial Amendment to the FY 2020-21 Annual Action Plan

The City seeks to amend the FY 2020-21 Annual Action Plan again to internally reallocate funds in an effort to make the most effective use of the CDBG-CV funds in the amount of \$110,341. The reallocation amount will move \$107,041 of CDBG-CV funding from housing, including rehabilitation, and \$3,300 from grant administration, to support housing stabilization due to COVID such as eviction prevention and rapid rehousing. This will allow families to remain in their homes.

As noted above, the City of Portage's federal Annual Action Plan details the funding strategy for the Community Development Block Grant (CDBG) program each year. The Annual Action Plan implements a jurisdictions multi-year Consolidated Plan and is developed through significant citizen participation, analysis, and planning.

Funding Reallocation Requests – Amendment to the FY 2020-21 Annual Action Plan

Below is a summary of the proposed budget. Through a substantial Amendment process, the City proposes including the following activities into the FY 2020-21 Annual Action Plan:

Project Name: Public Services (\$160,341)

National Objective: Low- and Moderate-Income Limited Clientele (LMC)
CDBG Eligible Activity: Public Services
Project Description: Funds will be used for emergency subsistence payments for qualifying low- and moderate-income individuals.
Explanation: Funding amount to be increased from \$50,000 to \$160,341. This is an increase of \$110,341.

Project Name: Housing (\$0; eliminated due to inactivity)

National Objective: Low- and Moderate-Income Housing Activities (LMH)
CDBG Eligible Activity: Rehabilitation and Property Acquisition
Project Description: Rehabilitation of owner-occupied housing, and/or the acquisition of vacant property for the future development of affordable housing in partnership with a nonprofit or housing agency for low- and moderate-income qualifying residents.
Explanation: Remaining \$107,041 to be reallocated from “Low- and Moderate-Income Housing Activities” for rehabilitation and property acquisition to be closed out as service provider has undertaken no projects to date.

Project Name: Public Facilities Improvements (\$50,000)

National Objective: Low- and Moderate-Income Area Benefit (LMA)
CDBG Eligible Activity: Public Facilities and Improvements
Project Description: Development of an outdoor trail in the Lexington-Green Park.
Explanation: No Change

Project Name: Administration/Planning (\$26,700)

National Objective: Not Applicable
CDBG Eligible Activity: General Administration
Project Description: Planning and Administration of CDBG-CV3 funding.
Explanation: Reducing Administration/Planning budget by \$3,300.

Public Process

The City of Portage held one public hearing regarding the substantial amendment and reallocation of CDBG-CV funds with the Human Services Board on March 2, 2023. The purpose of said meeting was to receive input from Board members and citizens about the proposed amendment involving the use of CDBG-CV funds. The meeting was held in City Council Chambers at the Portage City Hall, 7900 South Westnedge Avenue, Portage, Michigan. A copy of the meeting minutes is attached as Appendix A. Please call 269-329-4477 between the hours of 8:00 am and 5:00 pm for instructions on providing additional public comment.



**CITY OF PORTAGE, KALAMAZOO COUNTY, MI
2020-2021 ANNUAL ACTION PLAN
SUBSTANTIAL AMENDMENT EXECUTIVE SUMMARY
CDBG-CV Funding**

The City of Portage will provide a public notice advertising a 30-day public comment (Appendix B) period as part of the Public Participation Plan requirements.

The City of Portage will accept public comment during the thirty (30) day public comment period beginning on March 2, 2023 through April 1, 2023. Citizens are asked to provide comment on the Substantial Amendment to the FY 2020-21 Annual Action Plan, the proposed reallocation of CDBG-CV funds, and the proposed amendment to the Public Participation Plan.

A copy of the 2020-21 Annual Action Plan CDBG-CV Substantial Amendment Summary and Public Participation Plan will be made available to review and posted on the City's website beginning on March 2, 2023.

The draft document is available for review at the following locations:

- Department of Community Development, City of Portage, 7900 South Westnedge Avenue, Portage, MI 49002
- Portage District Library, 5528 Portage Road, Portage, MI 49002
- Portage Community Center, 325 East Centre Avenue, Portage, MI 49002
- City of Portage web site (<http://www.portagemi.gov/180/Human-Services-Board>)

Public comments can be e-mailed to the Department of Community Development at forthc@portagemi.gov or can be mailed to the City of Portage Department of Community Development, located at 7900 S Westnedge Avenue, Portage, MI 49002. For more information call 269-329-4474.

It is anticipated the City of Portage City Council will take action on the proposed Amendments to the 2020-21 Annual Action Plan and Public Participation Plan at a meeting scheduled for March 7, 2023. For more information on how to access this meeting please call 269-329-4474.

The City will provide technical assistance to citizens and groups representative of persons of low- and moderate-income that request such assistance in the review of program activities and program amendments. In addition, the City will make adequate and reasonable provisions to assist non-English speaking residents in interpreting program opportunities and provisions on a case-by-case basis, as well as provide auxiliary aides and services for individuals with disabilities. Requests for special accommodations must contact the City Clerk's Office at 269-329-4511.

TO: Honorable Mayor and City Council

FROM: Pat McGinnis, City Manager

SUBJECT: AVB Contract for Housing Development at 9617 Portage Road

SUPPORTING PERSONNEL: Jonathon Hallberg, Interim Director of Community Development

ACTION RECOMMENDED: Approve the selection of AVB, Inc., for a public-private partnership to develop a housing development at 9617 Portage Road and authorize the City Manager to commence negotiations related to the remaining elements of the development on behalf of the city.

The City of Portage adopted the 2022 Attainable Housing Plan to guide strategic and comprehensive approaches to creating additional housing opportunities within the city and to ensure that supply meets demand, and is safe, attractive, and well-maintained. To this end, the City of Portage purchased a 14-acre parcel at 9617 Portage Road from Colonial Engineering Inc. on September 10, 2021, for \$265,000. The land was acquired with the intent of developing a high-value residential development and the goal of presenting all the units for sale to households in the MSHDA 80-120% Area Median Income (AMI) bracket. On December 20, 2022, the city contracted with Wightman for infrastructure development. The firm has since completed a topographic study of the site, has begun the Phase I Environmental Site Assessment, and is currently waiting for the city to contract with a private developer to begin drafting a site plan including street layout and utilities.

On September 22, 2022, the City of Portage released a Request for Statements of Qualifications (RSFQ) and received responses from the following groups:

- Roberts Development Group, Inc.
- AVB, Inc.
- JTB Homes & Interra Homes
- Meyer C. Weiner Company
- PlazaCorp

Subsequently, on November 21, 2022, the City of Portage released a Request for Proposals to invite developers, lenders, attorneys, engineers, architects, contractors, and sub-contractors to partner with the City of Portage to develop and/or construct residential housing on the Portage Road site. Responses were received from the following groups:

- Allen Edwin
- AVB, Inc.
- JTB Homes & Interra Homes

A seven-member selection committee was established to evaluate the proposals and was comprised of:

- City Staff:
 - Pat McGinnis, City Manager
 - Adam Herringa, Deputy City Manager
 - Jonathon Hallberg, Interim Director of Community Development
- Valued Local Housing Partners:
 - Beth McCann, Executive Director, Kalamazoo Neighborhood Housing Services (KNHS)
 - Matt Milcarek, Director of Construction Services, KNHS
 - Zac Bauer, Executive Director, Local Initiative Support Corporation (LISC) Kalamazoo
 - Emily Petz, Community Development Coordinator, WE Upjohn Institute

On February 8, 2023, the selection committee members convened at City Hall to evaluate and score each proposal based on responsiveness to each of the selection criteria provided in the Request for Proposals document. Following this initial meeting, two contractors, AVB and JTB Homes/Interra Homes, were invited to present proposals and clarify concerns and/or questions to the committee in-person at City Hall on February 28, 2023. Both meetings, and the process, were facilitated and moderated by the city's Purchasing Manager, Victoria Barboza.

Summary of Proposal Evaluations

A summary of each proposal evaluation by the Selection Committee is provided below.

AVB, Inc.

AVB has more than 50 years of real estate experience and 40+ years of residential construction experience. AVB is a Portage-based company and, having constructed numerous developments within the City of Portage, the firm is familiar with the people, expectations, regulations, and infrastructure involved. Additionally, AVB has partnered with Wightman for more than 25 years.

The AVB team was found to provide added value and exceed the expectations and requirements of the Request for Proposal with respect to each of the selection criteria. The proposal was detailed, comprehensive, innovative, and versatile.

The project proposal submitted by AVB demonstrates a deep understanding of the funding gap between the project cost and affordability for the 80%-120% AMI housing brackets that the project is meant to serve. The firm has identified a combination of sources and methods to secure the appropriate funding to bridge this gap. AVB has had success in securing funding from incentive programs in the past, including the Tall Timbers and the Trade Centre developments. The proposal also exceeded committee expectations for a realistic, yet relatively short, project timeline. AVB recommends a two-phase approach, with approximately 34 homes to be completed by 2026 and an additional 44 homes by 2029. In summary, the AVB project plan proposes the development of 78 homes in six years with a total concept project cost of \$24,115,600. Of this total, the infrastructure cost is estimated at \$3,250,000, and the building cost is estimated at \$20,865,600. A breakdown of the proposed funding plan includes the following sources:

Homeowner Down Payments (3%)	\$440,841.00
Homeowner Mortgages	\$14,253,846.00
TIF Recapture	\$3,276,000.00
NEZ Property Tax Reduction	\$1,950,000.00

Total Funding \$19,920,687.00

This leaves a total funding gap of \$4,194,914 that must be reconciled through value engineering of additional revenue sources.

JTB Homes & Interra Homes

JTB Homes & Interra Homes (JTB/Interra) provided a detailed proposal that exceeded many of the criteria evaluated by the selection committee. The team has vast experience in residential housing development. To date, most of the firm's work has been in the Grand Rapids area, leaving them less familiar with the infrastructure, zoning, and codes for the Portage area.

For the team at JTB/Interra, this would have been the first project with a significant funding gap between affordability and cost, rendering them inexperienced with the various incentive programs and funding opportunities available for the targeted 80%-120% AMI group. However, JTB/Interra has contracted with Ryan Kilpatrick, Lead Consultant for Housing Next and Owner of Flywheel Companies, to partner on attainable housing projects. The selection committee felt that JTB/Interra would have much to offer in regard to future projects.

The JTB/Interra project proposal demonstrates great thought for integrating the development into the existing environment regarding architecture, landscape, and vehicular/pedestrian access. The total concept project cost for this proposal was lower than that of AVB, at \$18,427,820. However, the plan would result in the development of only 64 homes.

Allen Edwin

The proposal submitted by Allen Edwin proposed the greatest number of housing units at 99. The concept also had the lowest vertical cost projections at \$16,317,000. The team has significant experience in developing housing for the projected 80%-120% AMI brackets. When evaluated by the selection committee, the overall proposal scored below expectations in several categories. The committee felt that Allen Edwin failed to provide a project narrative that demonstrated a clear methodology, process, means, services, and financial mechanisms to complete the development.

It is recommended that City Council approve the selection of AVB, Inc. for a public-private partnership to develop a housing development at 9617 Portage Road and authorize the City Manager to commence negotiations related to the remaining elements of the development on behalf of the city.

FUNDING: The purpose of this communication is to recommend a development partner. Methods and amounts of compensation remain to be determined.

Attachments:

1. 2022 RFSQ Housing Development
2. Housing Development RFP Document
3. AVB Response to City of Portage Workforce Housing RFP 1.20.2023

Request for Statements of Qualifications (RFSQ) – Housing Development

The City of Portage is seeking Statements of Qualifications (SOQ) from developers, lenders, attorneys, engineers, architects, contractors and sub-contractors to partner with the City of Portage to develop and/or construct residential housing initiatives.

Firms found to be qualified to provide these services as a result of this RFSQ will be placed on a list to be eligible to participate in subsequent Requests for Bids (RFB), Requests for Proposals (RFP), or informal solicitations.

The City of Portage is engaged in a strategic, comprehensive approach to creating additional housing opportunities. To this end, the City has acquired various properties and is seeking private partners to facilitate the development of new residential housing initiatives in the City. Specifically, the City owns a 14 acre parcel at 9617 Portage Road, and has developed preliminary concepts to best develop a high-value, residential development with a goal of presenting all of the units for sale to households in the MSHDA 80 – 120% AMI income brackets.

To be considered, please submit your Statement of Qualifications no longer than 10 pages to Victoria Barboza, Purchasing Manager, before 5:00 p.m. on October 20, 2022. Include, at a minimum, the following detail in your submission:

1. Name, address, email and phone number of primary contact.
2. Team members assigned to project and their experience and qualifications
3. Partners on project (developers, lenders, legal, engineers, architects, contractors and sub-contractors)
4. Examples of single and/or multi-family construction project built in Michigan in past five years
5. Experience in developing attainable, workforce housing in Michigan
6. Any other information that may be helpful

The Firm's experience, resources, qualifications, experience and ability of the assigned staff will all be significant factors in the selection process.

Questions and requests for clarification related to definition or interpretation of this RFSQ shall be submitted in writing prior to **5:00 p.m.** local time on **October 14, 2022** by email to:

Victoria Barboza, Purchasing Manager
purchasing@portagemi.gov

No questions will be accepted via telephone and oral explanations or instructions shall not be considered binding on behalf of the City. An addendum will be issued via email in response to questions.

The City of Portage thanks you for your interest and participation.

Request for Proposals (RFP) – Housing Development

The City of Portage is requesting proposals (RFP) from developers, lenders, attorneys, engineers, architects, contractors and sub-contractors to partner with the City of Portage to develop and/or construct residential housing initiatives.

The City of Portage is engaged in a strategic, comprehensive approach to creating additional housing opportunities. To this end, the City has acquired various properties and is seeking private partners to facilitate the development of new residential housing initiatives in the City. Specifically, the City owns a 14 acre parcel at [9617 Portage Road](#), and is requesting proposals for how to best develop a high-value, residential development with a goal of presenting all of the units for sale to households in the MSHDA 80 – 120% AMI income brackets.

To be considered, please submit proposals on or prior to **Friday, January 6, 2023 at 3 pm** via BidNet at the following website: [MITN Purchasing Group](#). Please call the MITN Purchasing Group support department toll free 1-800-835-4603 option #2 for any questions related to registering with BidNet or submitting a response via BidNet. Include, at a minimum, the following detail in your submission:

1. Name, address, email and phone number of primary contact.
2. Summary of team members assigned to project and their experience and qualifications
3. Summary of partners on project (developers, lenders, legal, engineers, architects, contractors and sub-contractors)
4. Site Concept Plan
 - a. Site Concept Plan must include proposed layout of units, multimodal access points open space/common space, stormwater infrastructure locations, general landscaping/screening, parking, and sidewalks.
 - b. Respondents may provide more than one/an alternative concept if desired
5. Project Narrative
Please include a description of the project, an overview of the methodology, processes, means, services and financial mechanisms that will be used to render the development. Describe how the proposal meets project requirements, aligns with connectivity and character of the area, consistency with the [Lake Center District Corridor and Placemaking plan](#), incorporates innovation and sustainability elements, and details maintenance plans.
6. Cost Proposal
Respondents may provide more than one/alternative pricing scenario if desired. Please include at a minimum:
 - a. Price Proposal and Pro-Forma, including contingency
 - b. Price per Lot (overall, and per housing type)
 - c. Total Project Cost
 - d. Use of Subcontractors -if work is anticipated to be subcontracted, please note work that will be subcontracted.

Format: Please provide in Excel and transmit in the original file format (not PDF).
7. Summary Table of Total Units Delivered
 - a. There is an expectation that the project will include different price points that all fit within the 80-120% AMI range.
 - b. Please provide a detailed breakdown of the proposed number of units in each income band (e.g., 10% of units in the 100-110% AMI band)
 - c. Please provide how many units are anticipated to be delivered in each phase of the project.
 - d. For purposes of the proposal, please use MSHDA's 2022 figures for 80-120% AMI in Kalamazoo County, keeping in mind these figures are updated annually in April.

Format: Please provide in Excel and transmit in the original file format (not PDF).
8. Project Timeline and Delivery Phasing
Provide an anticipated timeline for project development, including a phasing schedule and map that include the number of units expected to be delivered in each phase.
9. Any other information that may be helpful

PROPOSAL REQUIREMENTS

1. Zoning

This project is anticipated to occur by means of a rezoning to [Planned Development](#) (PD). The general intent is for the project to follow PD zoning requirements. However, if the respondent can offer or demonstrate positive value to the future homeowner(s) through the following elements, flexibility in the PD requirements, including density, may be considered.

2. Multimodal or trail connections
3. Site preservation/ tree preservation
4. Energy efficiency– such as building materials, appliances, EV charging stations, etc.
5. Placemaking opportunities – such as playground, homes with front porches
6. Maximum street length
7. Parking requirements

For purposes of this project, and consistent with the PD and [Subdivision](#) platting regulations, the following elements will be required: two types of housing, sidewalks on both sides of the street, one street tree per lot, and street dimensions consistent with subdivision regulations (flexibility may be considered for maximum street length). For reference, Subdivision Improvements and Design Standards within the Subdivision code section are linked [here](#). It is expected that the development will connect to city water and sewer, and the streets will be public.

Ownership / Affordability

All units must be offered within the annual MSHDA 80-120% AMI range and must be owner-occupied.

The Proposal's concept plan, pro-forma, delivery schedule and overall responsiveness to the RFP, in addition to team qualifications and expertise, will be significant factors in the selection process.

PRE-PROPOSAL QUESTIONS

Questions and requests for clarification related to the definition or interpretation of this RFP or the Planned Development (PD) code shall be submitted in writing to the Deputy City Manager, Michael Carroll, at carrollm@portagemi.gov before 5:00pm on **Thursday, December 22, 2022**. **Due to the holiday, responses to questions will be posted on December 27th at the earliest.**

Queries or Alternatives/Scenarios not in line with the Planned Development (PD) code requirements may be presented during the preparation of proposals prior to proposal deadline. The City may consider these alternatives and an addendum will be issued in response to these queries and proposed alternatives, which will only be available by downloading from the BidNet website.

PROPOSAL OPENING

Proposals will be opened via WebEx on **Friday, January 6, 2023 at 3 pm**. Please find the meeting information below:

Proposal Opening for 2022 RFP Housing Development
Hosted by Purchasing Webex

<https://portagemi.webex.com/portagemi/j.php?MTID=m35d6d9358d0617c2d87b058c8b8fd8af>

Friday, Jan 6, 2023 3:00 pm | 1 hour | (UTC-05:00) Indiana (East)

Meeting number: 2300 877 7030

Password: BXRbPYj656

Join by video system

Dial 23008777030@portagemi.webex.com

You can also dial 173.243.2.68 and enter your meeting number.

Join by phone

+1-415-655-0002 US Toll

Access code: 230 087 77030



BUILD SOMETHING BETTER.

request for proposals for:



WORKFORCE HOUSING DEVELOPMENT

Designs are for layout, density and spacing purposes and are not intended to be the final designs.

Table of Contents



The Enclave Townhome Community

SECTION	PAGE
OPENING LETTER	3
AVB INFORMATION	4
TEAM MEMBER'S EXPERIENCE & QUALIFICATIONS	5
PRIMARY CONTACT	5
PARTNERS	7
PROJECT NARRATIVE	8
SITE CONCEPT PLAN	9
COST PROPOSAL	18
SUMMARY TABLE OF TOTAL UNITS DELIVERED	19
PROJECT TIMELINE AND DELIVERY PHASING	20
SITE CONCEPT PHASING MAP	21
ADDITIONAL INFORMATION	22



January 20, 2023

Ms. Victoria Barboza
Purchasing Manager
City of Portage
7900 South Westnedge Avenue
Portage, MI 49002

RE: Request for Proposals - Workforce Housing Development

Dear Ms. Barboza,

Turning off Stanely Avenue into Portage's new master-planned community, you're welcomed with well-designed single-family homes and townhomes with lush landscaping, encouraging you to settle in and lay down roots in your new home in the City of Portage. This sense of arrival and thoughtful design is what your AVB, Byce & Associates, and Wightman team will bring to life in this new housing community. Our team offers a unique blend of experience, capabilities, and services to meet the needs of your impactful project and assist your team, including:

- **An Owner's Perspective:** Our first-hand owner experience puts our team in your mindset. Understanding the importance of supporting a thoughtful community design, staying on budget, delivering each home on time, and ensuring the construction of the community and every home provides long-lasting quality and sustainability.
- **Consistent Team:** We believe a consistent team eliminates the opportunity for miscommunication. Your expert team will be there throughout the entire process.
- **Commitment after Completion:** Our goal is to create long-term satisfied clients. To accomplish this we commit to standing behind our quality work after our contract has ended.

We are 100% committed to being your partners for this new workforce housing community. We look forward to continuing to meet with you to show you how we can meet and exceed your expectations. You may call me at (269) 217-2057 or email me at jack@avbinc.com with any questions.

Sincerely,

Jack Gesmundo



Whisper Rock Condominium Community
Portage, MI

AVB Information

At AVB, our passion is creating great places to live and work. This commitment to building homes of the highest caliber possible is stronger than ever. Our 50+ years of real estate development and 40+ years of residential construction experience bring expertise throughout the entire process, from innovative design and materials to top-notch client communication and customer service.

Our talent-based team has been curated using a thorough selection and evaluation process based on our five core values: Be Client Focused, Be a Team Player, Do the Right Thing, Have a Positive Attitude, and Be Proud of What You Do. AVB's core values lead our daily approach to business. Additionally, our team is focused on building long-term satisfied clients, one at a time.

QUICK FACTS

We encourage you to scan or click the QR code below to get to know AVB better.



Team Member's Experience and Qualifications



JACK GESUMNDO PROJECT EXECUTIVE

1990 - Present

As Project Executive, Jack will directly participate in your project to ensure AVB exceeds your high expectations. This hands-on approach has helped AVB deliver its very best work for clients with the most demanding expectations. He will monitor project communications and adherence to schedule and budget.

With residential development experience in a wide range of project types, Jack has an expansive knowledge of the best way to manage a project, from inception through completion. Jack has managed numerous challenging and difficult projects throughout his career. His experience as a Project Executive, Senior Project Manager, and Owner's Representative gives him a 360-degree perspective of the entire development and construction process. He looks forward to the opportunity to listen to your team to ensure that AVB is achieving your desired goals.

EDUCATION

Western Michigan University

B.B.A. Finance & Marketing

University of Notre Dame

Executive Management

ACTIVE REGISTRATIONS

- Licensed Builder
- Certified Green Builder
- Licensed Real Estate Broker
- Board member on 7 Home Owner Associations

PRIMARY CONTACT

Address: 4200 W. Centre Ave.
Portage, MI 49024

Email: jack@avbinc.com

Phone: (269) 217-2057



JOHN BAKOS PRESIDENT OF CONSTRUCTION

2000 - Present

John will lead the construction team on this project. His role as President of Residential construction is to oversee and manage the construction of the project from bidding through construction, paying particular attention to cost and schedule. John works closely with the Owner and Architect teams to meet and exceed project requirements.

With over 30 years of project management experience, focusing on single-family and multi-family residential projects, John has a depth of practical knowledge in producing exceptional projects. His leadership strength, open communication style, and construction expertise combine to make John a valuable asset to construction teams and owners, alike.

EDUCATION

Michigan State University

B.S. Building Construction Management

ACTIVE REGISTRATIONS

- OSHA 30-Hour Certification
- First Aid, CPR, AED Certified
- Treasurer for Home Builders Association of Western Michigan board of directors

30+ YEARS OF RESIDENTIAL & MULTI-FAMILY CONSTRUCTION EXPERIENCE

Team Member's Experience and Qualifications



DAVE TIMMER SENIOR ESTIMATOR

1984 - Present

Dave will be responsible for preconstruction estimating, as well as the development of the trade contractor bid documents and purchasing. He will support the development of the full project budget and schedule working closely with the entire project team. Dave will oversee the complete contract administration, cost controls, and budget analysis to ensure that the project satisfies contract, schedule, and budget requirements.

Dave's extensive project experience enhances his estimating and planning abilities by providing first-hand knowledge of the complete construction process. Over the course of Dave's 35 years, he has overseen over \$500 Million of purchasing for residential projects. He fosters strong relationships with subcontractors and keeps abreast of changing market conditions to bring the best value to AVB's clients.

EDUCATION

Kalamazoo Valley Community College

Associates Degree

ACTIVE REGISTRATIONS

- First Aid, CPR, AED Certified

**40+ YEARS OF
RESIDENTIAL PURCHASING AND
ESTIMATING EXPERIENCE**



MIKE BARGY SENIOR PROJECT MANAGER

2003 - Present

Senior Project Manager, Mike Bargy, will work to ensure that the project objectives are met. He will have day-to-day responsibility for the project team and its performance and will remain as Project Manager for the entire duration of the work. Mike will oversee the complete construction progress including development, infrastructure, procurement of all building permits, inspections, and utility coordination. He will ensure quality and coordinate all required inspections including foundation, frame, plumbing, HVAC, electrical, energy audit, and final inspection. Additionally, Mike is responsible for providing all updates, following up on any issues, and running the milestone walks throughout the construction process. Mike has worked on several other similar projects and has worked closely with each of our other team members as well.

Mike's extensive field experience enhances his management abilities by providing first-hand knowledge of the complete construction process. He fosters strong relationships with subcontractors and keeps abreast of changing market conditions to bring the best value to his clients.

EDUCATION

Lansing Community College

**A.A.S. in Emergency
Medical Services**

Purdue University

**B.S. in Construction
Management**

ACTIVE REGISTRATIONS

- OSHA 30-Hour Certification
- Licensed Builder
- Asbestos Abatement Specialist
- Soil Erosion & Sediment Control
- First Aid, CPR, AED Certified

**20+ YEARS OF RESIDENTIAL
INFRASTRUCTURE &
CONSTRUCTION EXPERIENCE**

Partners

Our proposed team of AVB and [Byce and Associates](#) have experience working on single-family, multi-family, and workforce housing projects, both as individual firms and as a team. We are highly familiar with the City of Portage's requirements, people, and expectations. Our team has collaborated on previous projects such as the Charles & Lynn Zhang Portage Community Senior Center for the City of Portage. Our extensive experience also leads to our deep understanding of maximizing the City's value by ensuring this new development is high quality, well-designed, and value-conscious. Additionally, we have over 25 years of experience working with Wightman.

Our team has deep roots in our community and a good understanding of the City's mission, processes, and master plan. With our combined extensive knowledge of the City's regulations and infrastructure, we are able to understand the big picture and allow our design to reflect this.

Further, we have strong relationships with local lenders, such as Horizon Bank, First National Bank, and Mercantile Bank, and local legal providers, such as Honigman and Miller Johnson. We have the depth of experience necessary, the lender, and the legal relationships to make your project a success.

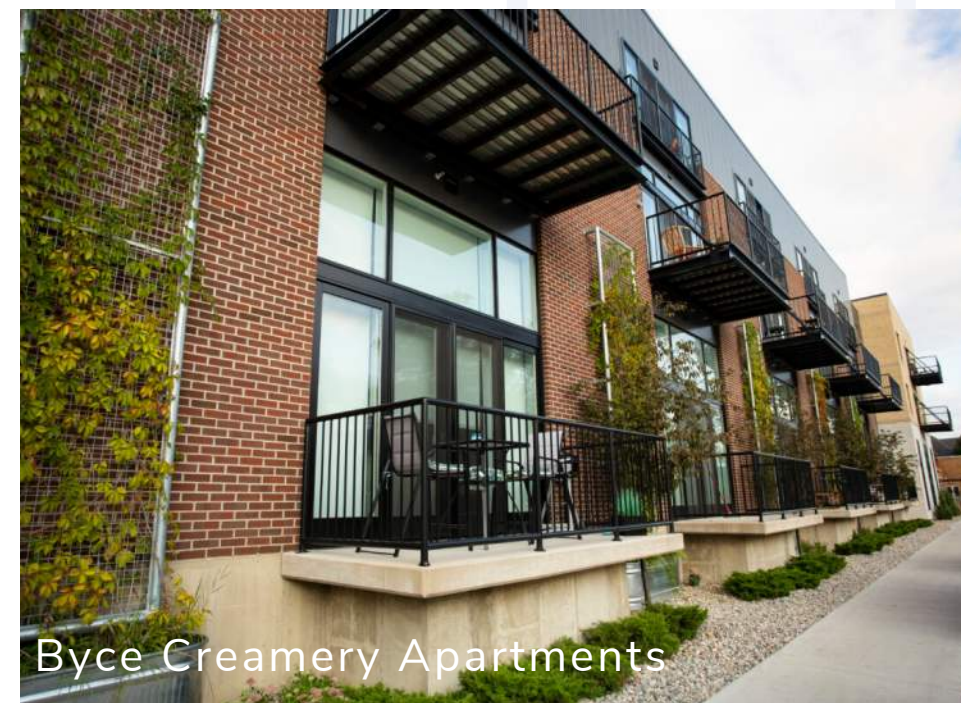
Ultimately, our goal is to bring our significant experience as developers, designers, and home builders to your project to create the best possible project within the budget. Through engagement, unsurpassed client focus, and creative solutions, we look forward to the opportunity to “Build Something Better” for The City of Portage.



AVB Enclave Community



AVB & Byce Portage Community Senior Center



Byce Creamery Apartments



Byce Prairie Gardens Development

Project Narrative

At AVB, we are passionate about creating places with lasting value for people to live and grow for generations. Our focus is developing first-class communities that are thoughtfully designed to create a sense of arrival while preserving and embracing natural features. Examples of this work can be viewed in any of our popular City of Portage communities, including Whisper Rock, The Homestead, Oakland Hills, and Woodbridge Hills.

We used this same focus when we developed Our Plan for this workforce housing development, which we believe is consistent with the City's vision. Our Plan is to develop your 14-acre property with 34 two-story single-family homes and 44 two-story townhomes at 5.6 homes to the acre, 78 homes total. We have also provided an Example Alternate plan that presents 16 additional homes.

Throughout our proposal, you will find Our Plan meets project requirements by adhering to Planned Development (PD) zoning, is multimodal with sidewalks on both sides of the street, and preserves the natural setting of the site. Additionally, Our Plan offers two housing types, each with energy-efficient potential, placemaking opportunities, and available parking. Most importantly, we have strived to show you how AVB can best develop a high-value residential development and how we can help you sell each home to households within MSHDA's 80%, 100%, and 120% Area Median Income (AMI) brackets.

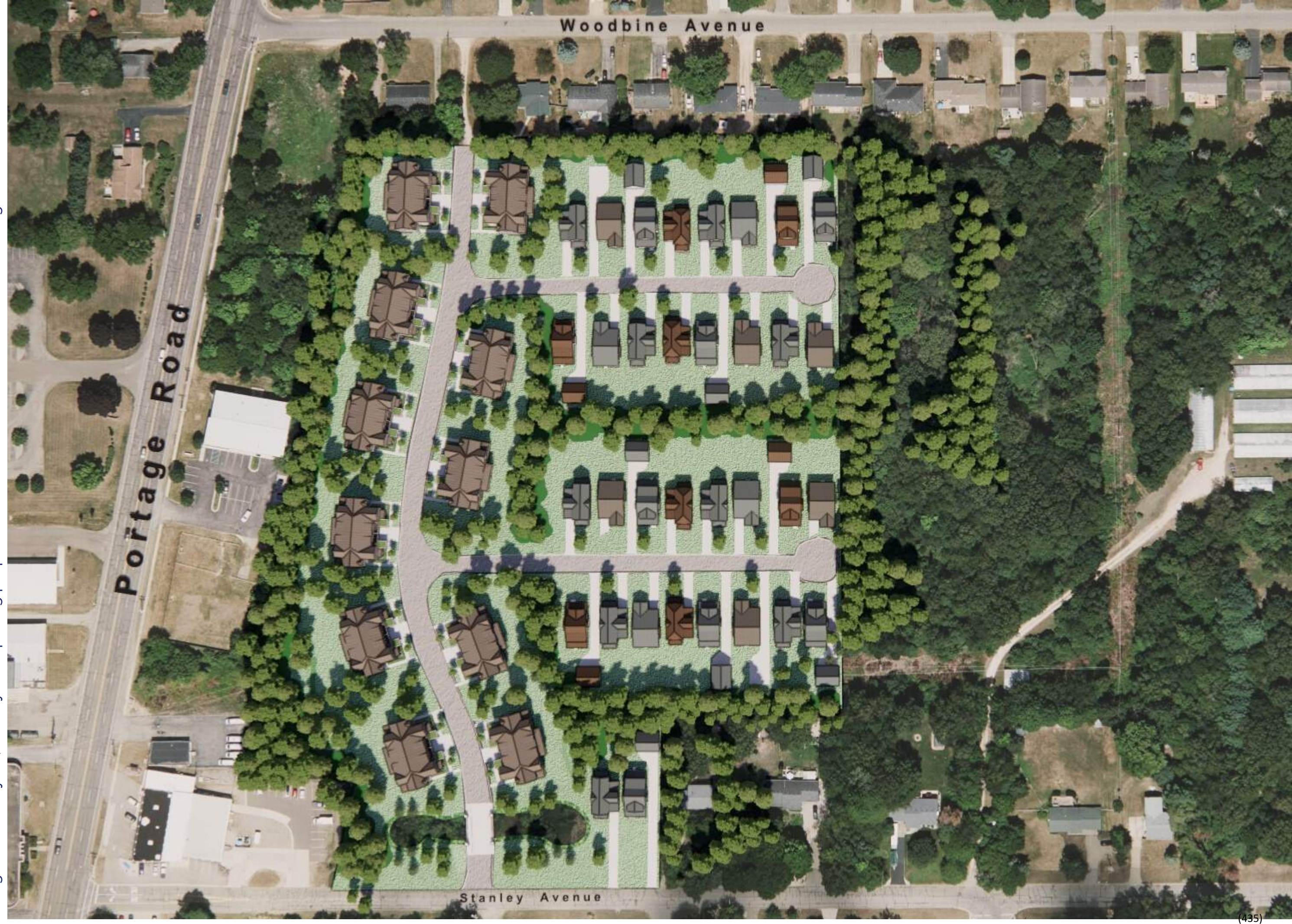
The Enclave Townhome Community



Our Plan

Concept Site Plan

Designs are for layout, density and spacing purposes and are not intended to be the final designs.



AVB's Processes, Means, Services, and Financial Mechanisms To Render the Development

Our extensive experience in designing, developing, building, and marketing communities will help ensure the City of Portage receives maximum benefit from engaging with our team on this new home community. We have developed a proven program to help guide the City and its partners through a successful residential development project. Our specific program includes the following steps:

- Overall community design and financial plan
- Rezoning
- Site plan approval
- Definition and approval of housing scope (home styles, elevations, floor plans, materials, colors, and pricing)
- Infrastructure construction phase 1 and phase 2 (grading, utilities, roadways, etc.)
- Single-family home and townhome construction
- Milestone walks throughout the construction process of the development and homes
- Construction draws
- Client interfacing including walkthroughs and delivering completed new homes
- Customer service after home completion



Development Details

- **Existing Conditions:** The property is currently a wooded vacant site with a large Consumers Energy power line. We intend to preserve the woodland around the perimeter of the community and recommend relocating the Consumers Energy line within the development (funding for relocating the Consumers line has not been included in our projected costs and needs to be grant funded or included in the proposed TIF capture).
- **Manmade Features:** We have included a beautiful entry statement, additional landscaped features, and two landscaped cul-de-sacs.
- **Utilities:** All homes will be served by municipal sanitary sewer, water, underground gas, electric, and communication lines.
- **Building Requirements:** The proposed setbacks, minimum square footage, and home-style are consistent with other similar neighborhoods with Planned Development zoning:
 - Front yard – 25'
 - Side yard minimum distance between foundations - 20', detached garages - 5'
 - Rear yard – 10' to 30'
 - Minimum Square footage - 1,100
 - Style – two-story single-family homes and two-story attached townhomes.
- **Stormwater Plan:** The stormwater system within the roadways will be constructed in accordance with City of Portage standards and dedicated to the City. Our design accommodates stormwater within the new development, creating a water feature at the community entry as illustrated on the site plan.

Connectivity and Character of the Area



- **Access:** We plan to develop two entry's into the community, the main entrance would be located along Stanley Avenue, and the secondary entry located along Woodbine Avenue. Additionally, we've included two access points to the east for potential future development. We have designed the community so that all single-family home driveways access will be from the side streets, while higher-density townhome driveways access will be from the main roadway.
- **Roadways:** It is our intent to develop this community with public streets. We are proposing 28'-32' wide streets excluding curb and gutter. Additionally, the streets will be posted for parking on one or both sides depending on street width, excluding the cul-de-sacs. Parking will also be provided in the garages and will be allowed in the driveways of each home.
- **Entry Statement:** The entry statement will create a beautiful sense of arrival to the new housing community. Our plan is to develop extensive landscaping, including irrigation.
- **Sidewalk:** We are proposing to extend the public sidewalk throughout the community on both sides of the roadway, linking to Stanley Avenue, Woodbine Avenue, and Portage Road. We plan to develop the internal sidewalk system as we construct each home.
- **Common Elements:** The proposed common elements, including the entry statement, stormwater retention areas, and cul-de-sacs would be owned and maintained by the Association.

Consistency with the Lake Center District

The proposed new housing community will play an integral part in the Lake Center District Corridor and Placemaking Plan. With this parcel of land located in a prime area near Lakeview Park, Lake Center Elementary, the Lake Center Isthmus, and Ramona Park, the thoughtfully planned community would provide both connectivity and placemaking to the area. Our curvilinear main roadway, with sidewalks that runs through the heart of the community, provides both safe and enjoyable space for pedestrian and bike traffic. In addition, the preservation of green space and natural landscaping will provide a welcoming environment for residents and encourages exploration of the neighborhood and surrounding area. By combining a mix of single-family homes and townhomes, this community provides new, modern options that are flexible intergenerational and meets the needs of various demographics. This will entice migrating home buyers to the area as it provides an opportunity that is currently lacking in the Lake Center housing market.



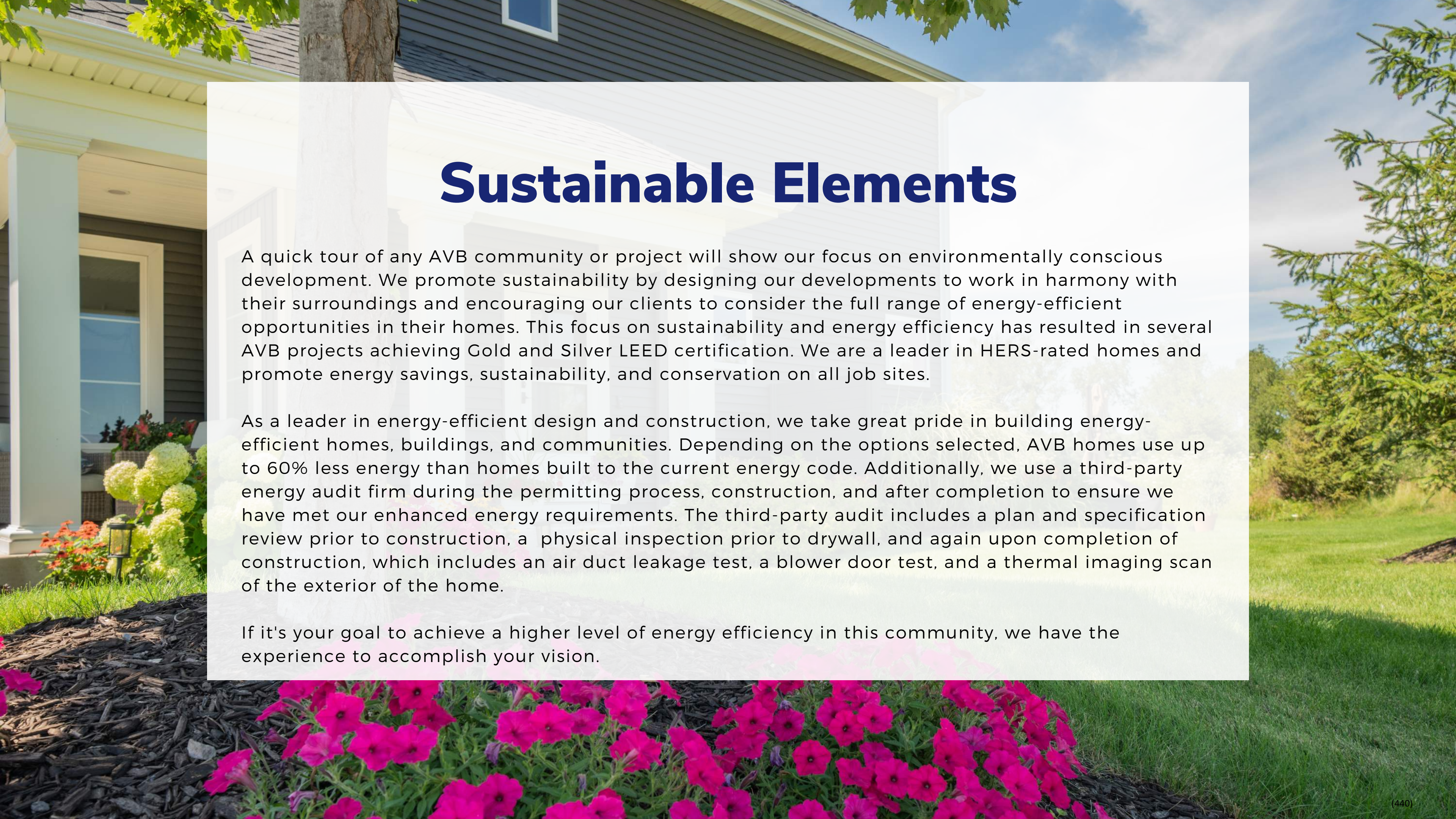
Lakeview Park



Lake Center Elementary



Ramona Park



Sustainable Elements

A quick tour of any AVB community or project will show our focus on environmentally conscious development. We promote sustainability by designing our developments to work in harmony with their surroundings and encouraging our clients to consider the full range of energy-efficient opportunities in their homes. This focus on sustainability and energy efficiency has resulted in several AVB projects achieving Gold and Silver LEED certification. We are a leader in HERS-rated homes and promote energy savings, sustainability, and conservation on all job sites.

As a leader in energy-efficient design and construction, we take great pride in building energy-efficient homes, buildings, and communities. Depending on the options selected, AVB homes use up to 60% less energy than homes built to the current energy code. Additionally, we use a third-party energy audit firm during the permitting process, construction, and after completion to ensure we have met our enhanced energy requirements. The third-party audit includes a plan and specification review prior to construction, a physical inspection prior to drywall, and again upon completion of construction, which includes an air duct leakage test, a blower door test, and a thermal imaging scan of the exterior of the home.

If it's your goal to achieve a higher level of energy efficiency in this community, we have the experience to accomplish your vision.

Maintenance Plans

- **Master Deed:** AVB is recommending the new housing community as a site condominium with a mix of housing types to appeal to different market segments. A Master Deed will be recorded to create this community and will include the requirements to maintain the common elements, including entry statement, retention areas, landscaping features, and cul-de-sac islands, through an Association.
- **Association:** Similar to other AVB communities, we recommend implementing an association to represent the interests of this new community. Made up of members of the community who are elected to serve on the board of directors, the board will work to set goals, create policies and regulations, as well as plan and implement programs and activities that foster a sense of community and pride.
- **Affiliated Architecture Review Committee:** The affiliated AVB architectural review committee is in place to review plans for proposed changes to a building or landscape within a given community. The committee's aim is to ensure that the changes adhere to any local zoning and design standards and fit in with the overall aesthetic of the neighborhood. The committee provides valuable input and feedback, helping to ensure that changes are beneficial to the community and reflect the shared values of the people who live in it.



Understanding the Gap Between Cost & Affordability

To achieve the vision outlined within the above response, we are anticipating each home investment will start in the \$309,000 range and will require additional financial assistance to meet the desired 80%, 100%, and 120% Area Median Income (AMI) brackets. To help clarify the reason a gap between cost and affordability exists (why additional financial assistance will be required), we've included two tables below. The first shows the average affordability for a new home for a household within the 80%, 100%, and 120% AMI brackets. The second illustrates the cost to build new housing in today's market. The last row of each chart demonstrates the gap.

Affordability				Cost			
	80% AMI	100% AMI	120% AMI		2-Story Single Family Home	Townhome	3-Story Walk-Up Condominium (optional home type)
Average Wages Earned / Hour	\$23.85	\$29.81	\$35.77	Square Footage per Home	1,400	1,400	1,200
Average Annual Income	\$49,608	\$62,000	\$74,400	Home Construction Cost	\$260,400	\$273,000	\$194,400
30% of Monthly Income less taxes, utilities, and insurance, applied to a Mortgage	\$326	\$636	\$946	Development of Homesite Cost	\$49,000	\$36,000	\$36,000
Maximum Purchase Price of a New Home without Assistance	\$54,325	\$105,938	\$157,551	Total Cost	\$309,400	\$309,000	\$230,400

Bridging the Gap

We have worked to identify the costs associated with this development plan as well as the potential methods that can bridge the gap between buyers (future homeowners) with incomes at 80%, 100%, and 120% of AMI, and the costs we have identified. The gap can be filled with a combination of the following sources and approaches:

- Kalamazoo County Housing for All Millage Request – estimated at \$1,600,000/year for six years
- Neighborhood Enterprize Zone (NEZ) – the establishment of a NEZ will allow for lower tax payments in the first 15 years of home ownership and therefore allow homeowners to have more dollars available for financing a home
- TIF District – partnering with the Kalamazoo Land Bank would allow property taxes to be captured to repay the investment of site development costs, thereby lowering the total cost of each home.

As noted above, to help further bridge the gap, we recommend the City enter into a development agreement between AVB, the City of Portage, and the Kalamazoo County Land Band. This arrangement of the new housing community will allow each homeowner to become eligible for incremental tax capture for TIF. We believe that most, if not all in some cases, of the \$36,000 - \$49,000 site development cost per home can be reimbursed to the City of Portage, thereby helping to bridge the funding gap for each homeowner. Further, we are confident this community will also be eligible for funds through NEZ, which can reduce the gap of each house by approximately \$25,000.

AVB has extensive experience securing incentive programs for other developments, such as Tall Timbers and the Trade Centre development. We will work with the City and other vested partners to make this project successful by identifying any additional available incentive sources such as Brownfield Tax Credits. While the Brownfield Tax Credits are of substantial value for this project, the site development costs need to be funded in advance and paid back over time by tax capture. We would request that the City fund the site development costs initially, to be paid back over time by TIF. AVB will also pursue Consumers Energy rebates, additional grants, and potential affordable housing property tax incentives; some of which are still under consideration by the Michigan Legislature.

Finally, we have included an Example Alternate site concept to demonstrate how the gap could be bridged with a mix of mostly townhomes (92) and two single-family homes. The additional density afforded by this product reduces site development costs per unit while still providing a very functional living arrangement for individuals and families.

AVB is confident that by using the creative strategies outlined above we can provide housing within the 80%, 100%, and 120% AMI brackets to current and future residents of the City of Portage. We look forward to the opportunity to further delineate our plan to provide a completely turn-key solution together with you.

Cost Proposal

A. Price Proposal & Pro-Forma

Per the RFP instructions, please see the original file format (excel document) attached to the submission email, titled "Portage Workforce Housing - Estimate Absorption Funding". Please note a 2.5% design contingency has been incorporated into our project prosal.

B. Price Per Lot/Price Per Home Type

C. Total Project Cost

	Price Per Lot (Land Development Only)	Price Per Home Type (Construction Cost Only)	Total Project Cost
Single Family Home (no garage included)	\$49,000	\$260,400	\$309,400
Townhome (2-car garage included)	\$36,000	\$273,000	\$309,000
Total Cost for Our Plan	\$3,250,000	\$20,865,600	\$24,115,600
Total Cost for Example Alternate	\$3,410,000	\$25,636,800	\$29,046,800

D. Use of Subcontractors

AVB will subcontract all construction elements. AVB extensively has used quality local sub contractors, since it's inception, to drive excellent workmanship and pricing into every home.

Summary Table of Total Homes Delivered

Per the RFP instructions, please see the original file format (excel document) attached to the submission email, titled "Portage Workforce Housing - Estimate Absorption Funding".

A. Total Homes Breakdown by Income Band

	80% AMI	100% AMI	120% AMI
Our Plan	33% (14 towns / 11 single-fam)	32% (15 towns / 11 single-fam)	35% (15 towns / 12 single-fam)
Example Alternate	32% (30 towns)	34% (31 towns / 1 single-fam)	34% (31 towns / 1 single-fam)

B. Total Homes Delivered by Project Phase

	Phase 1 (2023 - 2026)	Phase 2 (2026 - 2029)
Our Plan	34 homes (16 town/18 single-family)	44 homes (28 town/16 single-family)
Example Alternate	42 homes (40 town/2 single-family)	52 homes (52 towns)

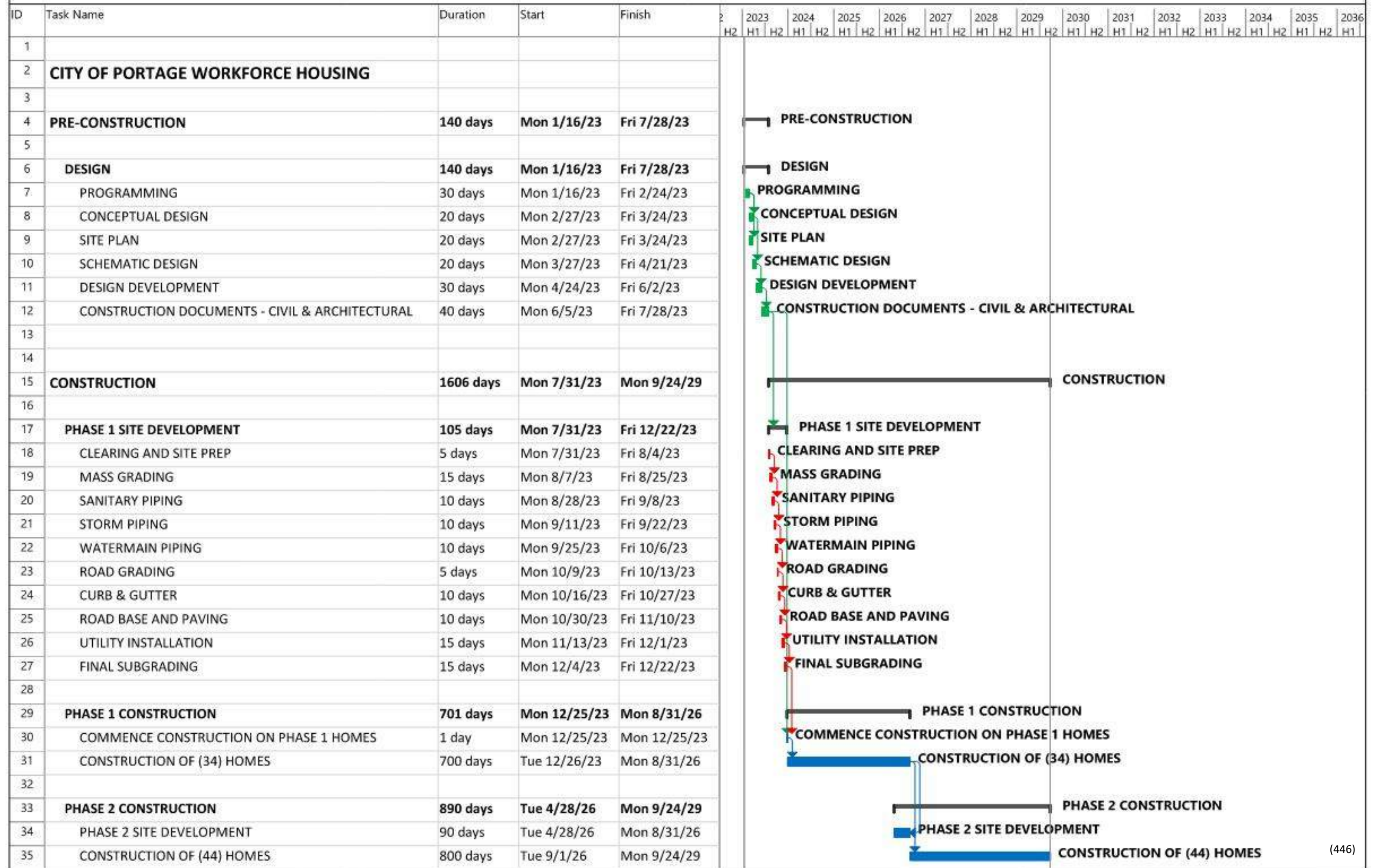
*Please see the Project Timeline and Delivery Phasing schedule on the following page for a thorough breakdown per year, accompanied by our "Absorption and Funding Schedule" breakdown which we've included in our Price Proposal & Pro Forma Excel documents attached to our submission email. Note the total AMI band amounts, Housing for All Funding, and construction costs are expected to increase annually relative to inflation.

As a local residential and commercial builder, we have the resources available to increase production as needed to meet an accelerated schedule if the City chooses. This would be reviewed with the City for specific conditions.

Our Plan

Project Timeline and Delivery

Phasing Schedule



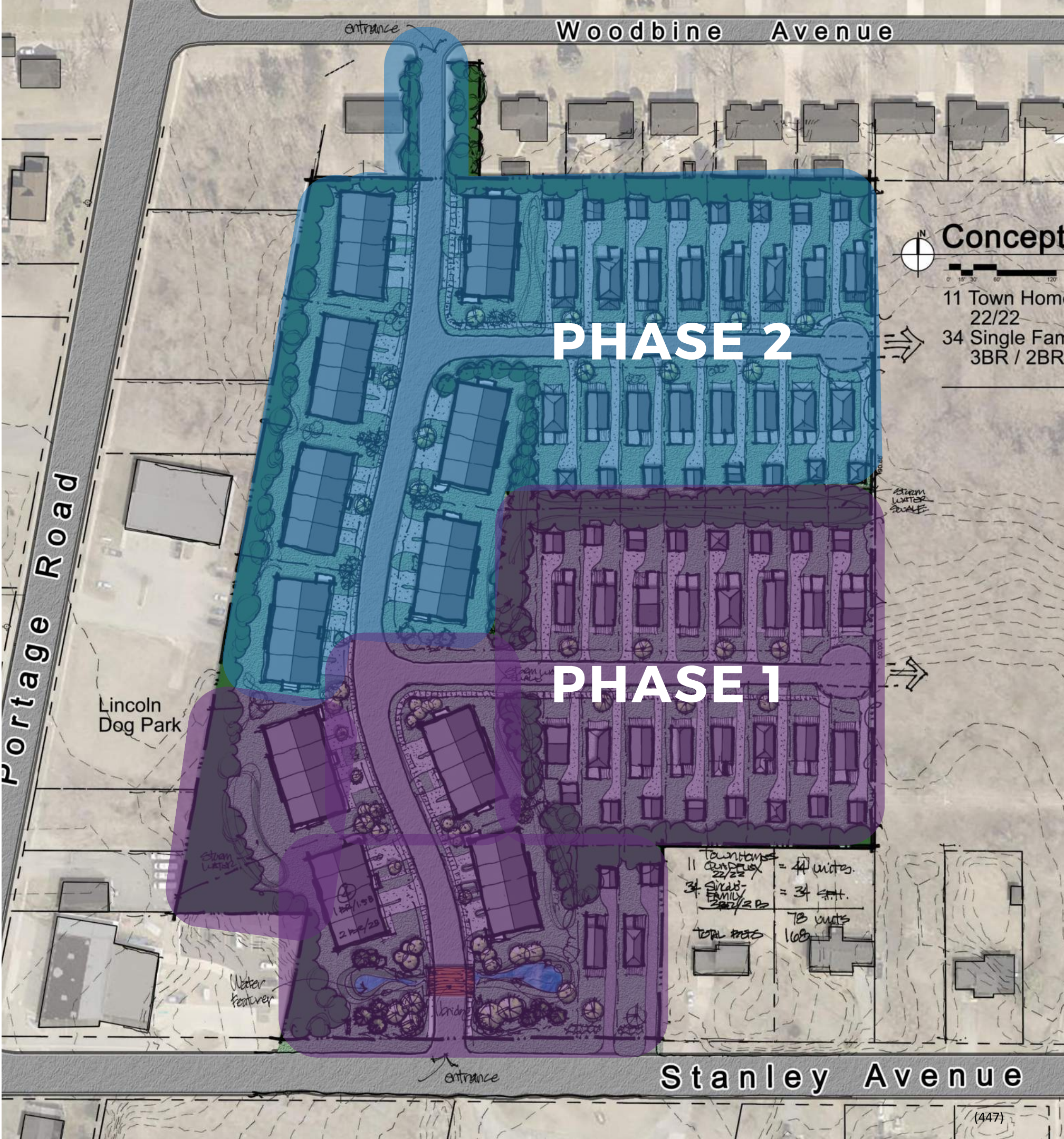
Our Plan

Site Concept Phasing Map

1 ENTRY STATEMENT &
34 HOMES DELIVERED

2 44 HOMES DELIVERED

Designs are for layout, density and spacing purposes and are not intended to be the final designs.



Considering Cost Along the Housing Continuum

To meet the requirements of the 80%-120% AMI affordability range, this project will require substantial financial assistance. We feel strongly this development will help provide the very much needed desirable and affordable workforce housing. In addition, it will provide a draw of new homeowners to the Portage Lake District Area. Our plan combines the best of new home options for those looking to move to homeownership with scaled levels of investment, lifestyle preferences, and maintenance responsibilities.

At AVB, we specialize in both single-family housing for market homeownership and multi-family housing for market rental or homeownership. With that in mind, there could be other options the City can consider to get this new development within the desired MSHDA income brackets. For example, a high-density community such as a three-story walk-up style building would not only decrease the cost of development but would also increase the number of families positively impacted by new housing. As development becomes higher-density, both the development costs and construction costs are substantially reduced per home. Understanding a three-story walk-up style housing solution, similar to the Tall Timbers development, is not the City's vision, we have provided a townhome example alternate that offers 94 total homes, made up of 92 townhomes and 2 two-story single-family homes. Please see the site concept and development phasing plan on the following pages and the cost implications in our attached excel document.

Partnering with AVB provides access to our extensive experience in building beautiful homes and developments at various points in the continuum. Our Proven Process and ability to value-engineer offer a unique advantage in creating and delivering on your exact needs. We look forward to working with you to create a new housing development that both meets your vision and your desired investment range.



Example Alternate

Site Concept Plan

Designs are for layout, density and spacing purposes and are not intended to be the final designs.

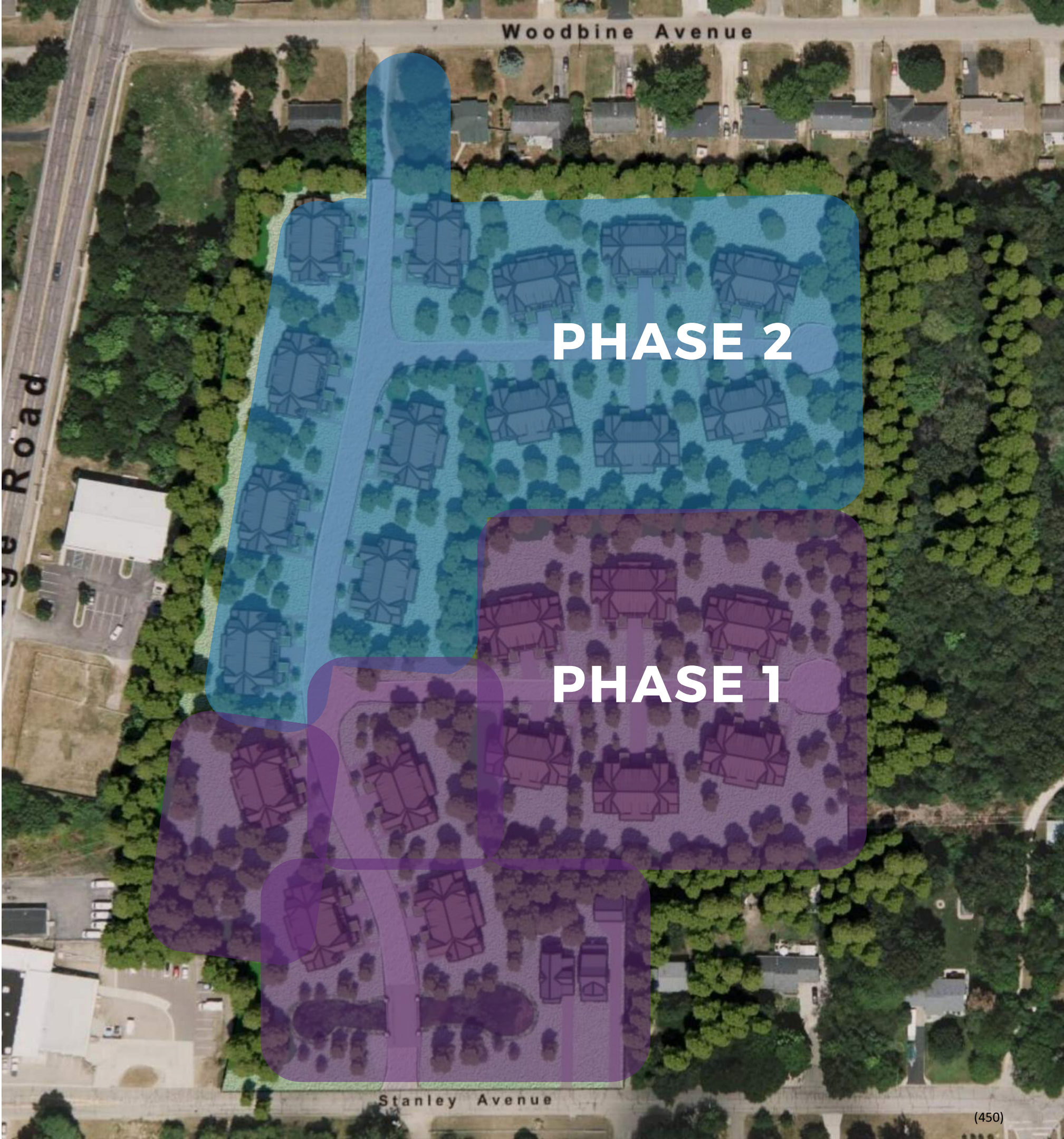


Example Alternate Site Concept Phasing Map

1 ENTRY STATEMENT &
42 HOMES DELIVERED

2 52 HOMES DELIVERED

Designs are for layout, density and spacing purposes and are not intended to be the final designs.



Minutes of Boards & Commissions

CITY OF PORTAGE ZONING BOARD OF APPEALS

Minutes of Meeting – January 9, 2023

The City of Portage Zoning Board of Appeals meeting was called to order by Chair Haddow at 7:00 p.m. four people were in the audience.

MEMBERS PRESENT: Linda Finch, Lynn Haddow, Michael Reedy, Winifred Kurtz, Linda Fry, Jay Eichstaedt, Ken Seybold

MEMBERS EXCUSED: Lena Jomaa

IN ATTENDANCE: Jeff Mais, Zoning & Codes Administrator; Josh Thall Assistant City Attorney.

APPROVAL OF THE MINUTES:

A motion was made by Finch, and seconded by Eichstaedt, to approve the December 12, 2022 minutes as submitted. Upon voice vote, motion passed 7-0.

NEW BUSINESS:

ZBA #22-07; 8911 Austin Court: Mais summarized the request for: a) an interpretation that a home occupation may be operated out of a garage; or b) a variance to operate a home occupation out of an accessory building at 8911 Austin Court. Mr. Peacock explained that they had gotten approval for a home occupation at their previous residence at 1555 Redstock Avenue in 1994. The applicant, Mr. Peacock, stated he was under the belief that in 1994 the city allowed home occupations in accessory buildings if that accessory building was part of the ‘principle building’ and code section 1240.08E at the time in his opinion reflected that. The applicant stated the language in the current code is not consistent between the medical marijuana section and other home occupation sections. Mr. Peacock added he thought the code definitions were confusing and did not think that ‘garage’ was defined in the code and that when they moved into the current residence at 8911 Austin Court he believed they were operating under the same approval granted in 1994 at 1555 Redstock Avenue. He asked the Board to consider that since his home occupation was not disturbing any neighbors that it should be considered consistent with the spirit and intent of the Zoning Ordinance. Mr. Peacock concluded by saying he was open to the Board imposing any conditions they saw fit to place on a variance in order to protect the neighborhood. Eichstaedt inquired if the medical marijuana section in paragraph C was applicable to paragraph A of Section 42-129. Mais responded paragraph C standards were not applicable to paragraph A and were worded differently to comply with State of Michigan’s marijuana laws. Haddow inquired if ZBA decisions were property specific or if they are transferrable between different properties. Attorney Thall stated Board decisions are property specific and not transferable. Eichstaedt inquired how deliveries occurred. The applicant stated mostly with personal vehicles but on rare occasions occurred with larger trucks. Eichstaedt inquired about business operations and how often deliveries occurred. The applicant stated deliveries were usually five or sometimes six days a week. Seybold inquired how the business had changed since 1994. Mr. Peacock stated that it now involved two people working part time instead of one. Finch inquired if the applicant had considered moving operations out of the garage and into the house. The applicant stated doing so would disrupt the living room and dining room. Eichstaedt inquired how many square feet the home occupation took up. Mr. Peacock responded the attached (576 square feet) garage. Reedy noted 576 square feet exceeded the maximum 25% of living area permitted.

A public hearing was opened. Sharon and Tammy Gildea, 8905 Austin Court, stated they found the home occupation deliveries to be disruptive and brought too much traffic into the dead end street. A letter of support from James Dreher, 2510 East Shore Drive was read into the record. A letter of opposition from Tammy Gildea-Bird, 8905 Austin Court was read into the record. A motion was made by Finch, seconded by Fry, to close the public hearing. Upon voice vote the motion passed 7-0.

After additional discussion, a motion was made by Eichstaedt, seconded by Finch, to make an interpretation that Section 42-129(A)(2) does not permit home occupations to operate out of a garage. Upon roll call vote: Eichstaedt-Yes, Fry-Yes, Haddow-Yes, Reedy-Yes, Seybold-Yes, Kurtz-Yes, Finch-Yes; the motion passed 7-0.

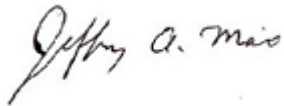
A motion was made by Seybold, and seconded by Eichstaedt to deny a variance to operate a home occupation out of an accessory building at 8911 Austin Court for the following reasons: there are no exceptional circumstances applying to the property that do not apply generally to other properties in the same zoning district; the variance is not necessary for the preservation and enjoyment of a substantial property right similar to that possessed by other properties in the same zoning district; the immediate practical difficulty was caused by the applicant; and the variance will materially impair the intent and purpose of the zoning ordinance. Upon roll call vote: Eichstaedt-Yes, Fry-Yes, Haddow-Yes, Reedy-Yes, Seybold-Yes, Kurtz-Yes, Finch-Yes; the motion passed 7-0.

OTHER BUSINESS: None

STATEMENT OF CITIZENS: None.

ADJOURNMENT: The meeting was adjourned at 8:25 pm.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Jeff A. Mais".

Jeff Mais
Zoning & Codes Administrator

CITY OF PORTAGE HUMAN SERVICES BOARD

Minutes of the Meeting – February 2, 2023

5:30 p.m. Conference Room 1

CALL TO ORDER: The City of Portage Special Human Services Board meeting of February 2, 2023, was called to order by Chair Brooke Kolodzieczyk at 5:35 p.m. in Conference Room 1, Portage City Hall, 7900 S. Westnedge Avenue, Portage MI.

MEMBERS PRESENT: Chair Brooke Kolodzieczyk, Vice Chair Jihan Young, Effie Kokkinos, Monica Lloyd, Justin Phan, Chelsea Huber, Bridget Lane, and Sue Beasley.

MEMBERS ABSENT: John Dillworth

OTHERS PRESENT: Ludim Torres

STAFF PRESENT: Tina Perry, Neighborhood & Housing Specialist

APPROVAL OF MINUTES: No Quorum was present at the January 5, 2023 meeting. The Minutes of December 1, 2022 were approved by a motion by Jihan Young and supported by Chelsea Huber. The motion was unanimously approved, 8-0.

NEW BUSINESS:

New Board member introductions. Sue Beasley and Bridget Lane were recently appointed to the HSB. Perry met and provided materials and an overview of the HSB. Brooke Kolodzieczyk welcomed and thanked them for their participation. HSB members introduced themselves.

CDBG Public Hearing to receive comments Annual Action Plan. The HSB held a Public Hearing to address comments on the Community Development Block Grant Notice of Request for Release of funds for the following projects:

- **Home Assistance Programs:** \$167,839 – Housing Rehabilitation Program Loans for Upgrades of Owner-Occupied Residences and Emergency repair grants for urgent home repair needs.
- **Homebuyer Down Payment Assistance program** \$3,000 – Loans to low-moderate-income first time homebuyers in the City of Portage.
- **Neighborhood Improvement** \$64,000 - Code Enforcement – Administration of the Community Quality Code, Housing/Property Maintenance Code, Zoning Code and/or Building Code in low/moderate income neighborhoods.
- **Human/Public Services** \$50,546 - Portage Community Center, Emergency, and Transportation assistance.
- **Administration** \$54,300 – General grant administration and Fair Housing Activities.

Chairperson Brooke Kolodzieczyk noted no written comments have been received and requested a motion to OPEN the public hearing to any Public Comments at the meeting. Jihan Young made a motion to Open the public hearing, Chelsea Huber supported the motion and it unanimously passed 8-0. No public comments were received. Chairperson Brooke Kolodzieczyk requested a motion to Close the Public Hearing for the Request for Release of Funds from HUD. Monica Lloyd made a motion to Close the public hearing, Chelsea Huber supported the motion and it unanimously passed 8-0.

OLD BUSINESS:

Human/Public Services Funding Applications review: Perry previously provided the Human Service funding applications that were received, the ranking order of applications derived from the average of HSB individual rankings. Perry provided a funding spreadsheet listing any current year funding, all

current requests and the average funding based on HSB individual funding amounts. Tina Perry shared comments regarding two of the applications received for initial discussion. Senior Care Partners PACE application requests a significant portion of the overall funding. The PACE program received a COVID grant that enabled them to purchase tablet for seniors to better assist them during the pandemic, when inhouse visits were very restricted. The tablets require costly maintenance, which is the request for this funding. It is stated in the application they will be seeking more affordable equipment to replace the costly tablets by mid-2024. A HSB comment received indicated that when funds in the GF are short, it is hard to invest in an outmoded technology that they're not going to use after this year. HSB agreed that while it's a great program with a worthy cause, the equipment maintenance should've been planned upon request of the COVID grant to purchase the equipment and would not be a good expenditure of GF's.

A HSB comment was also received that United Way's proposal is being staffed very lightly to accommodate the tax service that is being provided by PCC and the PZSC. HSB agreed that while it's a great program with a worthy cause, other organizations had been turned down for funding tax programs in the past due to the need already being met by other Portage organizations. Given the amount of funding available this would not be a good expenditure of GF's.

HSB spent significant reviewing the requests and is providing the following recommendations to City Council for review and approval:

GENERAL FUND FY2023-2024 \$205,400			
Applicant	Program	FY2023-2024 Request	HSB Recommended
Kalamazoo Literacy Council	ESL of SW MI	\$ 3,500	\$ 3,500.00
Kalamazoo Literacy Council	Comm Literacy Ctr @ Prince of Peace	\$ 1,500	\$ 1,500.00
Portage Community Center	Youth Development	\$ 35,000	\$ 32,000.00
Catholic Charities	Ark for Youth	\$ 17,000	\$ 10,000.00
Twelve Baskets	Free Store	\$ 10,000	\$ 5,000.00
Portage Community Center	Emergency Assistance	\$ 40,000	\$ 30,000.00
Twelve Baskets	Food Pantry	\$ 25,000	\$ 15,000.00
YWCA - Kalamazoo	Intimate Partner Domestic Assault Program	\$ 12,000	\$ 12,000.00
YWCA - Kalamazoo	Sexual Assault Program	\$ 7,000	\$ 7,000.00
YWCA - Kalamazoo	Human Trafficking Program	\$ 1,000	\$ 1,000.00
Milestone Senior Services	*Portage Critical Home Repair Program	\$ 25,000	\$ 15,000.00
Senior Care Partners PACE	GrandPad Tablet support	\$ 71,400	\$ -
Catholic Charities	Bread for Life	\$ 5,000	\$ -
Kalamazoo Valley Habitat for Humanity	*Critical Home Repair Program	\$ 25,000	\$ 20,000.00
Housing Resources, Inc.	Housing Stabilization Programs	\$ 30,000	\$ 25,000.00
Gryphon Place	2-1-1 Information & Referral	\$ 4,000	\$ 4,000.00
United Way	VITA Kalamazoo	\$ 10,000	\$ -
Portage Community Center	Community Collaboration	\$ 10,000	\$ 5,000.00
Disability Network Southwest MI	Ramp Up	\$ 20,000	\$ 12,000.00
Community Healing Centers	Childrens Early Intervention Program	\$ 10,000	\$ 7,400.00
Totals:		\$ 357,400	\$ 205,400.00

Chelsea Huber made a motion to recommend funding per the table, for review and approval by City Council. Justin Phan supported the motion. The motion was unanimously approved 8-0.

CDBG Annual Action Plan FY23-24 Funding

Perry commented that the CDBG application by PCC would be funded by CDBG; a separate budget was proposed for review by the HSB for the CDBG funding. Due to the amount Program Income received from loan repayments, the total budget for the CDBG FY23-24 program is greatly reduced to \$274,210 from the current budget of \$339,685.00. HUD requires the majority of funding to benefit low moderate persons and limits the amount of spending in the areas of Administration and Public Services

by instilling caps in those areas. Historically, administration has been well below the 20% cap at 8 to 12%. PCC received funding typically at the Public Services cap of 15%. With a greatly reduced budget, the Community Development department is recommending the following budget in the FY23-24 CDBG Annual Action Plan:

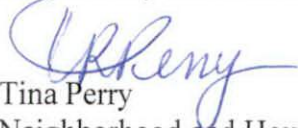
Neighborhood Improvement \$50,000
Housing Assistance Programs \$135,000 (w/\$50K reserve for strictly basic services)
Portage Community Center Transportation Assistance \$5,000
Administration \$34,210

Monica Lloyd made a motion to accept the Community Development staff recommended FY23-24 CDBG budget. Bridget Lane supported the motion and it unanimously passed 8-0.

STATEMENT OF CITIZENS: None

ADJOURN: 7:10 p.m. Motion to adjourn by Monica Lloyd, supported by Justin Phan and unanimously supported. 8-0.

Respectfully Submitted,



Tina Perry
Neighborhood and Housing Specialist
Community Development, City of Portage

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**City of Portage Environmental Board
Minutes for the Meeting on February 8, 2023**

Members present: Justin Gish, Jerry Kroehn, Lauren Tompkins, Jason Beasley, Thomas Schaffer, Loren Kimeldorf, Joseph Chamberlin, Jaime Harmon (ex officio)

7:02 p.m. Meeting called to order

- Thomas Schaffer made motion to start the meeting. Seconded by Justin G. Motion passed unanimously.

7:03 p.m. Welcome and Introduction of Guests

- No guests were present.

7:04 p.m. Public Comment

- No members of the public present to speak.

7:06 p.m. Approval of the January Minutes

- Jaime H. said she made edits for clarity but the substance remained the same.
- Lauren T. made motion to approve the minutes with edits. Jason B. seconded. Motion passed. Justin G. abstained as he was not present at January 2023 meeting.

7:07 p.m. New Tree Ordinance

- Jerry K. questioned if the intent was to bring back a previous tree ordinance discussion. For context, Loren K. explained the rationale behind the previously proposed ordinance. Thomas S. asked if the tree ordinance could be put into the upcoming master plan. Jerry K. suggested that if the intent behind this ordinance was to have more trees in Portage, why not encourage citizens to plant trees. Thomas S. suggested a targeted ordinance that would protect trees that would most benefit wildlife, especially birds as they relate to the Urban Bird Treaty. Jaime H. thought that it would be easier from the City's perspective to plant desired trees. Thomas S. suggested the city find a way to identify their trees to create a city-wide inventory of trees. It was thought that this would prove difficult, as expertise would likely be required, and it was not known if citizens have this expertise or the ability to hire an expert. Lauren T. suggested that the Board review existing ordinances to see what the city already requires regarding cutting of trees during development. Jason B. suggested looking at the policies of similar cities who are in Tree City programs and how they approach the tree issue being discussed. Lauren T. requested that board members familiarize themselves with the ordinances before next meeting, and Thomas S. suggested that board members keep the Urban Bird Treaty in mind as they explore the tree ordinance. Thomas S. made motion to table this discussion until next month so board members can educate themselves. Loren K. seconded. Motion passed.

7:35 p.m. Masterplan and Local Power Generation

- Thomas S. asked the board members for information that they pledged to research after last meeting. Lauren T. raised the point that there is really no incentive for individual citizens to decarbonize, pointing out that Michigan does not have good rebate programs to encourage citizens to put solar panels on their roof, or otherwise decarbonize. Loren K. suggested that the Portage City Council work to get the State Legislature to get incentives passed. Lauren T. suggested the city work on educational outreach to citizens teaching them about decarbonization and energy efficiency. Thomas S. asked Jaime H. if this could be put into the Portager. Jason B. raised a concern that advocacy and for energy efficiency could push developers away from creating affordable homes in the area. Loren K. suggested that developers need to see the value in energy efficiency, or they won't install these changes. Lauren T. volunteered to draft an educational piece for the Portager regarding decarbonization/energy efficiency. This will be submitted to the Board for their approval. Loren K. offered to coordinate an educational meeting for the board with local companies who can explain to the board more about the solar power and green energy. Lauren T. asked for a broader expert in renewable energy and all the policies, rather than a local solar company. Jamie H. will investigate who performed similar duties for the city and if they would be willing to speak to the Board. Loren K. will not reach out to the local solar company until he hears back from Jaime H.

8:27 p.m. Board Member Discussion on Upcoming Events

- Jerry K. asked about the Garlic Mustard Competition sponsored by the Portage Parks Department. The Board is not going to do a sponsored Garlic Mustard pull this year. Jerry K. thinks this is a terrible idea.

8:35 p.m. Motion to adjourn by Thomas S. Seconded by Jason B. Motion passed.

CITY OF PORTAGE PLANNING COMMISSION

**Thursday, February 16, 2023
7:00 PM Portage
City Hall Conference Room # 1**

The City of Portage Planning Commission meeting of February 16, 2023, was called to order by Chair Corradini at 7:00 p.m.

IN ATTENDANCE

- Eric Feldt, City Senior Planner
- Biqi Zhao, Deputy Director of Planning and Zoning
- Jonathon Hallberg, Interim Director of Community Development

ROLL CALL

Mr. Feldt called the roll: Chairman Corradini (yes); Vice Chair Joshi (yes); Fries (yes); Pezzoli (yes); Baldwin (yes); Adams (yes); Youngs (yes); Kasper (yes); and Freiman (yes).

APPROVAL OF MINUTES

1. Minutes dated January 19, 2023.

Motion by Commissioner Baldwin, seconded by Commissioner Kasper to approve the Planning Commission Meeting Minutes of January 19, 2023, as submitted. Motion carried 9-0.

PUBLIC HEARINGS

None.

SITE/FINAL PLANS

None.

NEW BUSINESS

1. Zoning Update Workshop

Director Hallberg and Mr. Feldt provided a workshop to the Commission, discussing current housing shortage, high demand housing needs, and conceptual zoning changes to increase future housing development. Director Hallberg presented the Kalamazoo County Housing Plan findings of current and proposed housing needs. He also presented the City of Portage Attainable Housing Plan and Council's Housing-related Priorities. He indicated that Council seeks staff and Planning Commission support in determining future zoning changes to meet Council's Housing. One future change Director Hallberg presented was Accessory Dwelling Units (ADU). He presented various images of ADUs and how it can provide various benefits to the greater housing needs, additional benefit to growing families, and opportunities to pay for housing. Director Hallberg also presented on-street parking needs relating to increased housing density. Along with those conceptual zoning changes, Mr. Feldt presented Form-based Code, its purpose, various illustrations, and how it influences urban-context design of housing, commercial, and mixed-use developments.

Director Hallberg provided a housing priority exercise for the Planning Commission, and asked them to rank 10 conceptual zoning code changes that support new future housing development opportunities in Portage. The top three items were:

- 1) Reduce minimum house size in the R-1A thru R-1D One-Family Residential Districts,
- 2) Reduce minimum lot size in the R-1A thru R-1D One-Family Residential Districts, and
- 3) Increase mixed-use districts.

Director Hallberg indicated that staff would explore and research these high ranked conceptual zoning code changes for future presentation and review by the Planning Commission.

OLD BUSINESS

None.

STATEMENT OF CITIZENS

None.

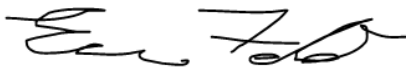
STATEMENT OF COMMISSIONERS/ STAFF

Mr. Feldt & Ms. Zhao informed the Planning Commission of a Master Plan Workshop scheduled for 4-5:30PM, Monday, March 20. The Commission will be tasked to provide feedback about existing conditions to reach an agreement on specific issues and concerns to be addressed moving forward, and it will serve as a foundation to further engagement with public. City staff and the consultant will host a public Community Visioning Workshop 5:30-8PM, Monday, March 20, and the Commission will be involved in facilitating the workshop.

ADJOURNMENT

There being no further business to come before the Commission, Chair Corradini adjourned the meeting at 8:49 p.m.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Eric Feldt".

Eric Feldt, AICP, CFM
City Senior Planner