

MAPS

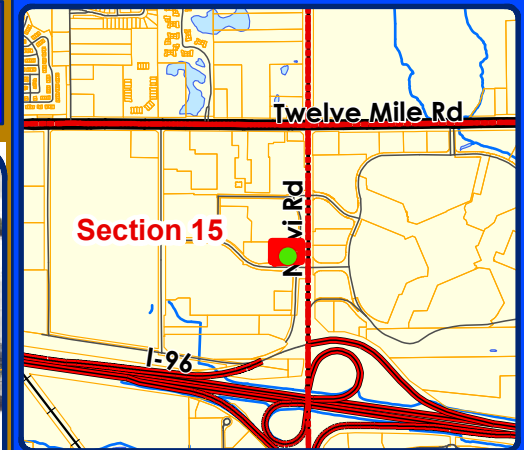
Location

Zoning

Future Land Use

Natural Features

CULVER'S LOCATION



 Subject Property

City of Novi

Dept. of Community Development
City Hall / Civic Center
45175 W Ten Mile Rd
Novi, MI 48375
cityofnovi.org

Map Author: James Hill
Date: 3/13/2024
Project: CULVER'S
Version #: 1

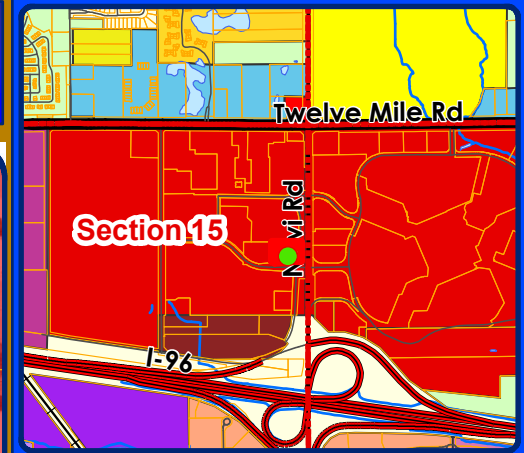
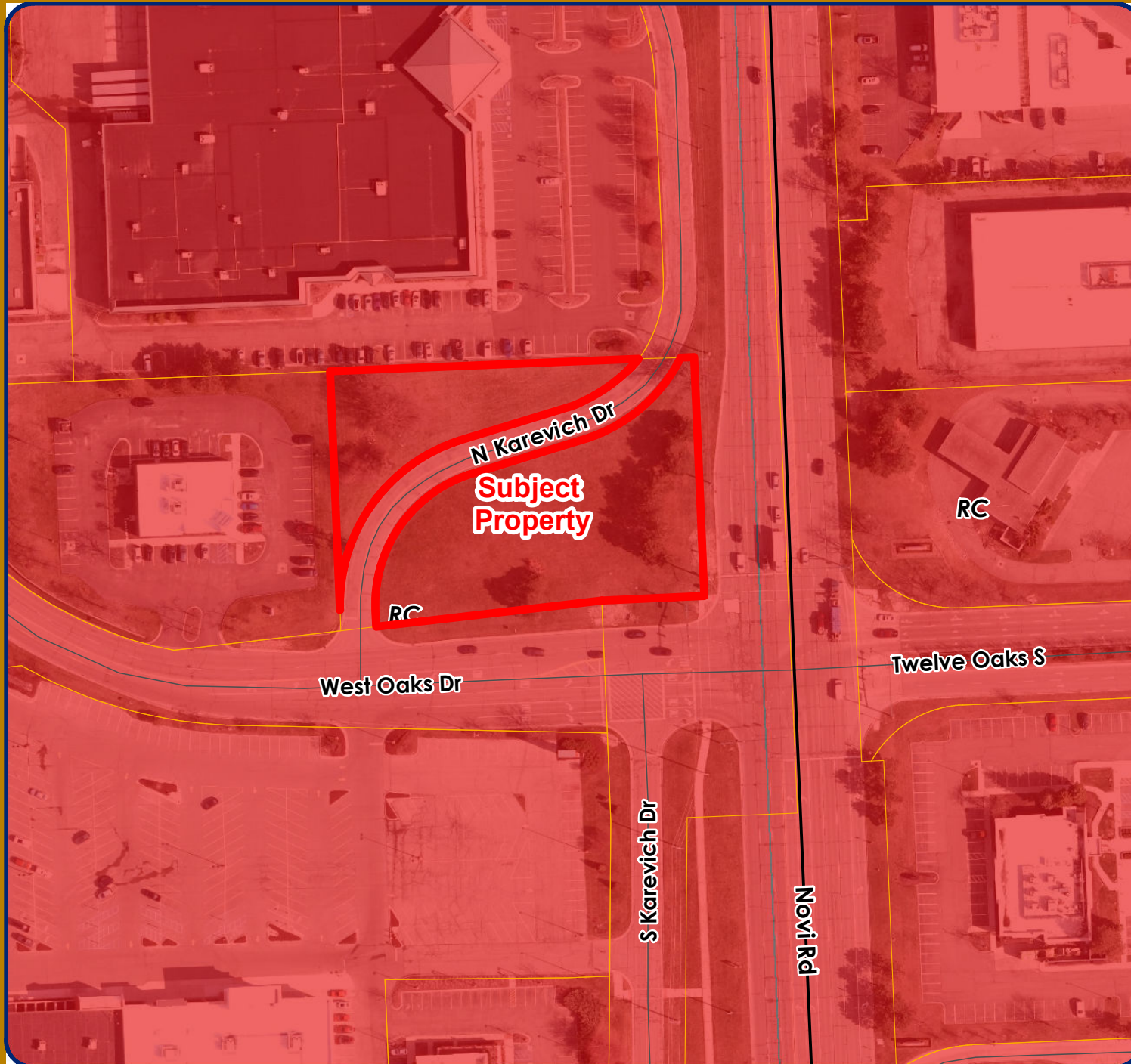
0 25 50 100 150 Feet
1 inch = 131 feet



MAP INTERPRETATION NOTICE

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

CULVER'S ZONING



 Subject Property

LEGEND

-  R-A: Residential Acreage
-  R-1: One-Family Residential District
-  R-4: One-Family Residential District
-  RM-1: Low-Density Multiple Family
-  B-3: General Business District
-  C: Conference District
-  I-1: Light Industrial District
-  I-2: General Industrial District
-  OS-1: Office Service District
-  OSC: Office Service Commercial
-  OST: Office Service Technology
-  RC: Regional Center District
-  TC: Town Center District

City of Novi

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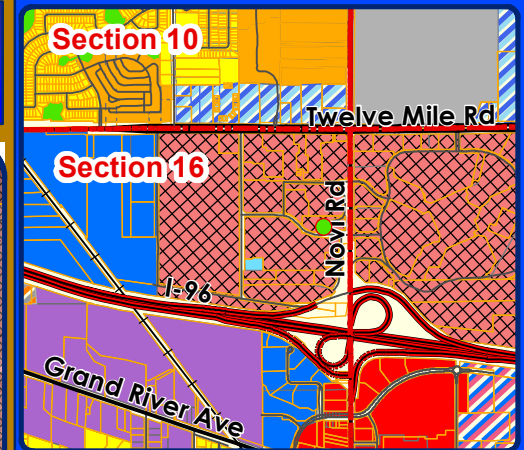
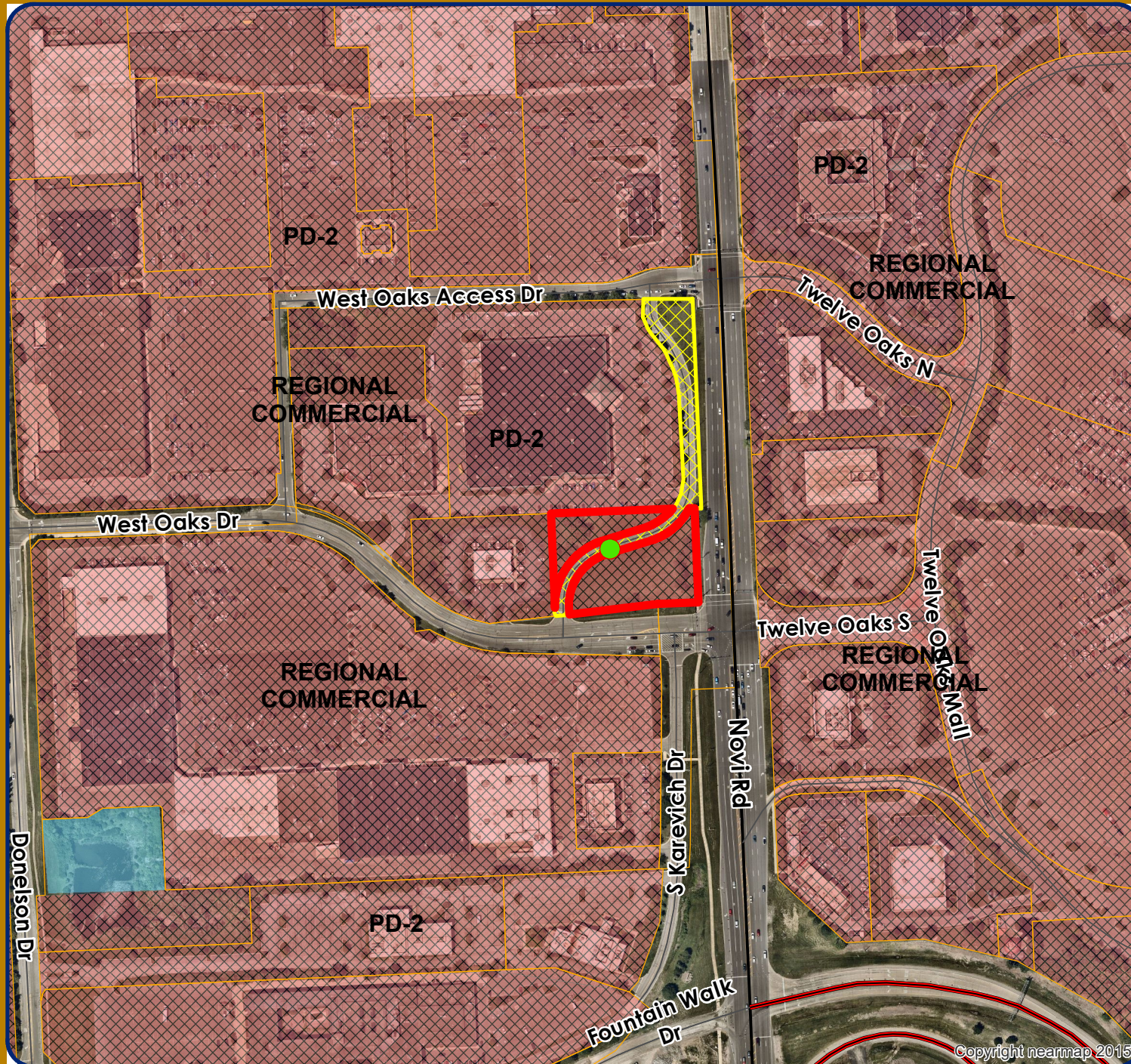
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JSP23-37 CULVER'S FUTURE LAND USE



Legend

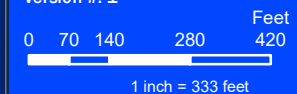
- Single Family
- Multiple-Family Residential
- Community Office
- Office, Research, Development and Technology
- Office Commercial
- Industrial, Research, Development and Technology
- Regional Commercial
- City West
- Town Center Commercial
- Town Center Gateway
- Public
- Public Park
- Cemetery



City of Novi

Dept. of Community Development
City Hall / Civic Center
45175 W Ten Mile Rd
Novi, MI 48375
cityofnovi.org

Map Author: Lindsay Bell
Date: 9/20/24
Project: CULVER'S
Version #: 1



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SITE PLAN

(Full plan set available for viewing at the Community Development Department)



CULVER'S NOVI
NOVI, MI | JULY 2024



CULVER'S NOVI - BUILDING ENLARGEMENT
NOVI, MI | JULY 2024



CULVER’S NOVI - SIDEWALK ENLARGEMENT
NOVI, MI | JULY 2024

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PRELIMINARY SITE PLANS

CULVER'S OF NOVI

W OAKS DR AT NOVI ROAD

NOVI, MI 48137

DEVELOPER/OWNER
UNION PACIFIC HOLDINGS LLC.
CHARLES PAISLEY
49169 ALPHA DRIVE
WIXOM, MI 48393
TEL: (248) 8600-8365

CIVIL ENGINEER
KIMLEY-HORN OF MICHIGAN, INC.
TYLER SMITH, P.E.
1000 TOWN CENTER, SUITE 1900
SOUTHFIELD, MI 48075
TEL: (313) 218-3272

LANDSCAPE ARCHITECT
KIMLEY-HORN OF MICHIGAN, INC.
AUTUMN MCNINCH
JOHN ACKERMAN, P.L.A.
1000 TOWN CENTER, SUITE 1900
SOUTHFIELD, MI 48075
TEL: (313) 572-1560

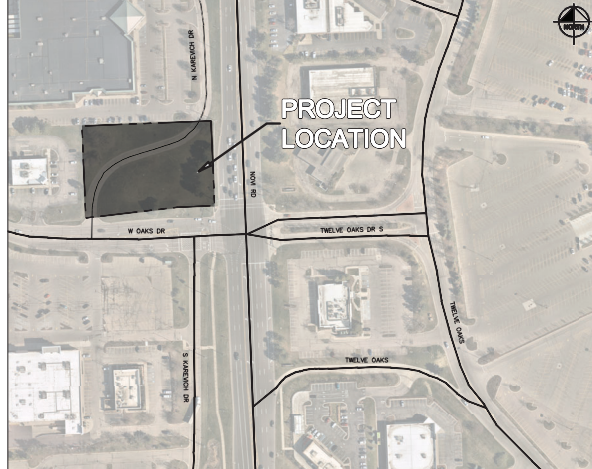
LAND SURVEYOR ENGINEER
NOWACK & FRAUS ENGINEERS
46777 WOODWARD AVENUE
PONTIAC, MI 48342
TEL: (248) 332-7931
EMAIL: RFRAUS@NFE-ENGR.COM

LEGAL DESCRIPTION

REFER TO SHEET V1.0

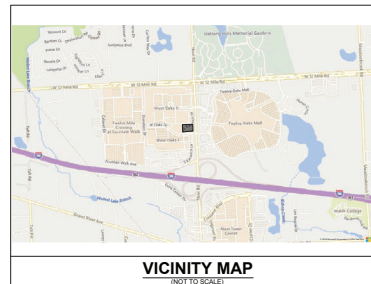
LOCATION MAP

(NOT TO SCALE)



OAKLAND

CONSTRUCTION OF A ± 4,100 SF RESTAURANT BUILDING FOR UNION PACIFIC HOLDINGS, LLC. PROJECT IS IN THE NE 1/4 OF SECTION 15, T1N, R8E IN OAKLAND COUNTY, MICHIGAN



VICINITY MAP

(NOT TO SCALE)

Sheet List Table

Sheet Number	Sheet Title
C0.0	TITLE SHEET
V1.0	ALTA SURVEY
C2.0	DEMOLITION PLAN
C3.0	SITE PLAN
C3.1	SITE PLAN
C4.0	GRADING PLAN
C4.1	DETAILED GRADING PLAN
C5.0	UTILITY PLAN - OVERALL
C5.1	UTILITY PLAN - STORM SEWER
C5.2	UTILITY PLAN - STORM SEWER PLAN AND PROFILE
C5.3	UTILITY PLAN- SANITARY
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C8.0	CIVIL DETAILS
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L1.0	EXISTING LANDSCAPE CONDITIONS & REMOVAL
L1.1	LANDSCAPE CALCULATIONS
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L1.3	LANDSCAPE DETAILS
IR-1	IRRIGATION PLANS



Know what's below.
Call before you dig.

CITY OF NOVI - RESUBMISSION	05/15/24	LF
SCALE: AS NOTED	DESIGNED BY: TJS	DRAWN BY: LJP
DESIGNED BY: TJS	DRAWN BY: LJP	CHECKED BY: TJS
DATE	REVISIONS	BY
No.		
Kimley-Horn of Michigan, Inc. 1000 TOWN CENTER, SUITE 1900 SOUTHFIELD, MI 48075 TEL: (313) 218-3272 WWW.KIMLEY-HORN.COM		
Culver's A Union Pacific Company		
TITLE SHEET		
CULVERS W OAKS DRIVE AT NOVI ROAD NOVI, MI 48137		
ORIGINAL ISSUE: 05/15/2024 KHA PROJECT NO. 268693000 SHEET NUMBER C0.0		

A MISS DIG TICKET NUMBER 20210905263, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS ENTERED FOR THE SURVEYED PROPERTY. DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEY MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON OCTOBER 12, 2023. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR IN THE FIELD OR AS DEPICTED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNERS AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.

PLEASE NOTE THAT DTE HAS NEW REGULATIONS THAT MAY IMPACT DEVELOPMENT OUTSIDE THEIR EASEMENT OR THE PUBLIC RIGHT OF WAY. CLIENT SHALL CONTACT DTE TO DETERMINE THE "NEW STRUCTURES AND POWER LINE" REQUIREMENTS AS THEY MAY APPLY TO ANY FUTURE BUILDING OR RENOVATION OF A STRUCTURE. DTE ENERGY CAN BE CONTACTED AT 800-477-4747

SITE AREA:
PARCEL 1: 41,566 SQUARE FEET OR 0.954 ACRES
PARCEL 2: 19,326 SQUARE FEET OR 0.444 ACRES
ZONED:
 RC, REGIONAL CENTER DISTRICT

PARKING SPACES:
NO PARKING SPACES (VACANT)

BUILDING SETBACKS:
FRONT: 100'
SIDES: 100'
REAR: 100'

MAX. BUILDING HEIGHT PERMITTED:
3 STORIES / 45 FEET

THE ABOVE ZONING AND ZONING REQUIREMENTS WERE OBTAINED FROM THE CITY OF NOVI ONLINE ZONING MAP AND ZONING ORDINANCE.

FRONT: THE SETBACKS & HEIGHT RESTRICTIONS NOTED ABOVE ARE FOR REFERENCE PURPOSES ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION AND SHOULD NOT BE USED TO DETERMINE COMPLIANCE. A SURVEYOR CANNOT MAKE A CERTIFICATION ON THE BASIS OF AN INTERPRETATION OR OPINION OF ANOTHER PARTY. A ZONING ENDORSEMENT LETTER SHOULD BE OBTAINED FROM THE CITY OF NOVI TO INSURE CONFORMITY AS WELL AS MAKE A FINAL DETERMINATION OF THE REQUIRED BUILDING SETBACK & HEIGHT REQUIREMENTS.

	SITE DISTURBANCE	
	PAVEMENT REMOVE	

--- SA ---	MANHOLE(MH)	---	SA ---	EXISTING SANITARY SEWER
--- SA ---	CO ---	---	SA ---	EXISTING SAN. CLEAN OUT
--- HYDRA(HYD) ---	GATE VALVE(GV)	---	W ---	EXISTING WATER MAIN
MANHOLE(MH) ---	CATCH BASIN(CB)	---	W ---	EXISTING STORM SEWER
--- ST ---	CB	---	ST ---	EX. REDEV. CATCH BASIN
UTILITY POLE GUY ST		---	UT ---	EX. OVERHEAD ELECTRIC
UT ---		---	UT ---	EX. UNDERGROUND (UG. E)
UG ---		---	UG ---	EX. UNDERGROUND (UG. G)
UG ---		---	UG ---	EXISTING GAS MAIN

LIGHT POLE
SIGN
ASPHALT
CONCRETE
FOUND
RETAINING WALL
RIGHT-OF-WAY
SET PK NAIL
TYPICAL
RECORD
MEASURED
CENTERLINE
PROPERTY LINE
GAS METER
ELECTRIC METER
LANDSCAPE
TRAFFIC POLE
FLAG POLE
HAND HOLE
ELECTRIC RISER
FIBER RISER
GUARD POST
SPRINKLER VALVE

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER.

ALL ELEVATIONS SHOWN HEREON ARE ON THE CITY OF NOWI DATUM (CITY OF NOWI BENCHMARK #1522, REFERENCED HEREON);
BEING THE SAME AS THE N.A.V.D. 88 DATUM (CORS).

THE BASIS OF BEARING FOR THIS SURVEY WAS ESTABLISHED BY THE RECORD DESCRIPTION AS SHOWN IN THE TITLE COMMITMENT AS REFERENCED BELOW:

THE LEGAL DESCRIPTION(S) AND ALL EXCEPTIONS SHOWN OR NOTED ON THIS SURVEY WERE OBTAINED FROM TITLE COMMITMENT NO. NCS-1183326-MICH, WITH A COMMITMENT DATE OF 06-20-2023, ISSUED BY FIRST AMERICAN TITLE INSURANCE COMPANY.

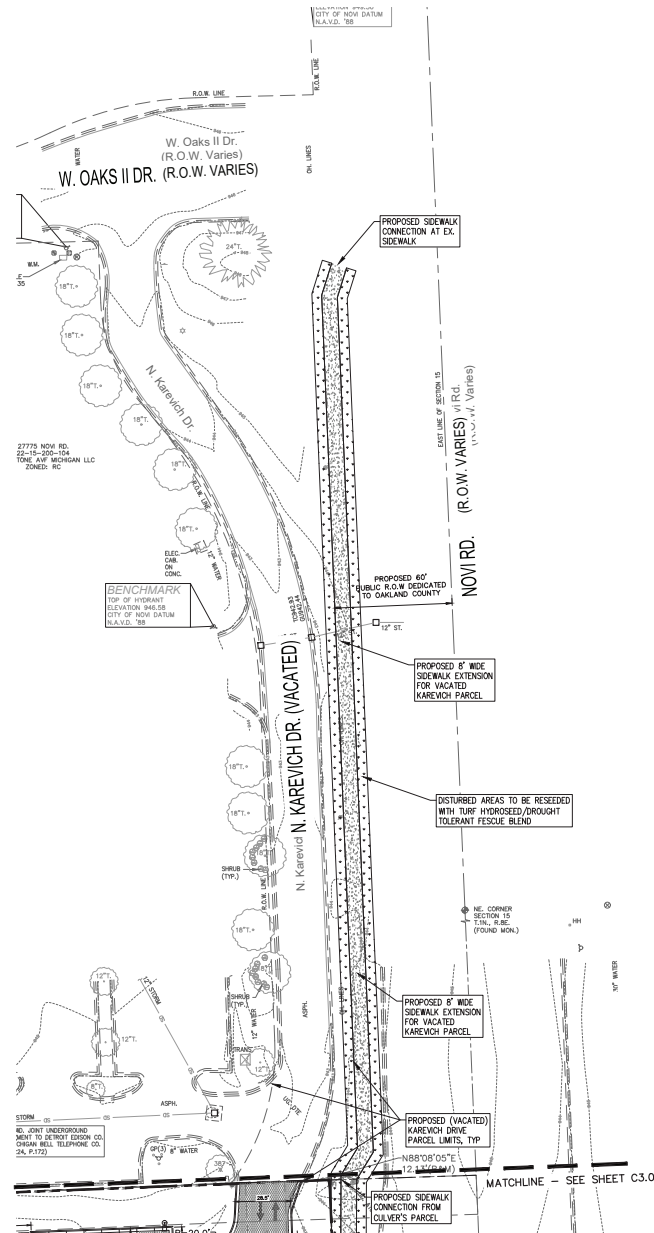
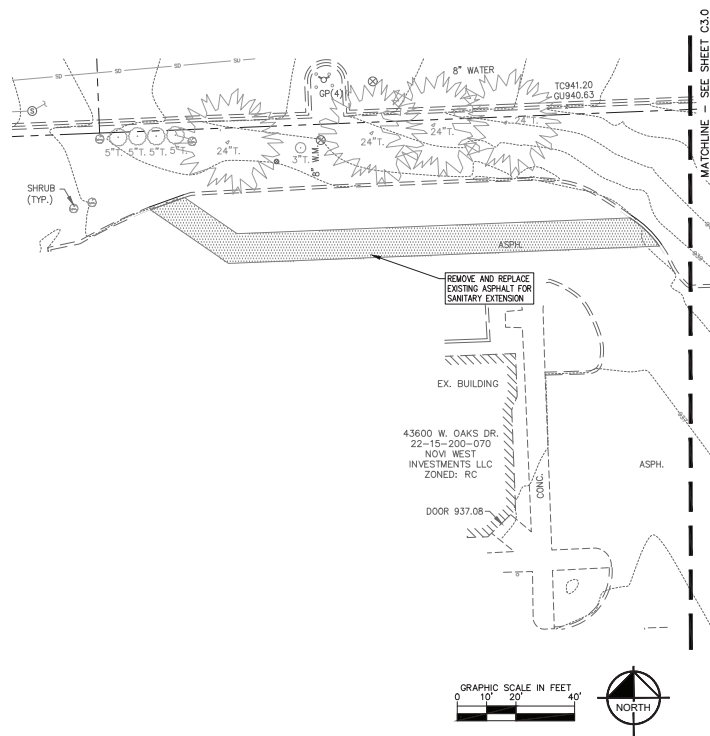
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DEMOLITION PLAN

CULVERS
 5 DRIVE AT NOVI
 NOVI, MI 48137

ORIGINAL ISSUE: 05/15/2024
KHA PROJECT NO. 268693000
SHEET NUMBER

C2.0



LEGEND

- | | |
|---|----------------------------------|
|  | PROPOSED LIGHT POLE |
|  | PROPOSED STORM INLET |
|  | PROPOSED STORM MANHOLE |
|  | PROPOSED ADS BARRICADE STRUCTURE |
|  | PROPOSED SANITARY SEWER MANHOLE |
|  | PROPOSED CLEANOUT |
|  | PROPOSED HYDRANT |
|  | PROPOSED WATER VALVE |
|  | PROPOSED WATERMAIN REDUCER |

- | | |
|---|--|
|  | STANDARD DUTY ASPHALT PAVEMENT
SEE CONSTRUCTION DETAILS FOR
PAVEMENT SECTION |
|  | HEAVY DUTY ASPHALT PAVEMENT
SEE CONSTRUCTION DETAILS FOR
PAVEMENT SECTION |
|  | CONCRETE SIDEWALK
SEE CONSTRUCTION DETAILS FOR
PAVEMENT SECTION |
|  | HEAVY DUTY CONCRETE PAVEMENT
SEE CONSTRUCTION DETAILS FOR
PAVEMENT SECTION |

SITE DATA TABLE

SITE AREA: 1.69 ACRES (73,763 SF.) NET AND GROSS
ZONING: RC

PROPOSED USE: RESTAURANT (4,060 SF.)

BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 45 FEET
PROPOSED BUILDING HEIGHT = 23 FEET (1 STORY)
BUILDING FOOTPRINT AREA = 4,060 SF
BUILDING LOT COVERAGE = 5.6%

SETBACK REQUIREMENTS:

FRONT:	100'
SIDE:	100'
REAR:	100'

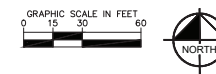
PARKING CALCULATIONS:
RESTAURANT = ONE FOR EVERY TWO EMPLOYEES, PLUS FOR EVERY TWO CUSTOMERS ALLOWED UNDER MAXIMUM CAPACITY (INCLUDING WAITING AREAS)
TOTAL PARKING REQUIRED = 90 SEATS / 2 = 45 SPACES
+ 6 EMPLOYEES PER SHIFT / 2 = 3
= 56 SPACES

TOTAL PROPOSED PARKING SPACES = 48 SPACES INC. 3 H/C SPACES
LOADING CALCULATIONS:
LOADING REQUIRED = 1 10'X50' SPACE
LOADING PROVIDED=865 SF AT BACK OF BUILDING

SITE PLAN NOTES

1. THERE WILL NOT BE ANY ROOFTOP EQUIPMENT INCLUDED WITH THE PROPOSED CULVER'S BUILDING
2. OUTDOOR SEATING PERMITTED BETWEEN MARCH 1ST AND NOVEMBER 30TH.
3. ALL TRAFFIC SIGNAGE WILL COMPLY WITH THE CURRENT MMUTC STANDARDS.

- 1 FIRE LANE
- 2 BARRIER FREE PARKING STRIPING
- 3 STOP BAR
- 4 3 BIKE HOOPS
- 5 DIRECTIONAL ARROW
- 6 DRIVE THRU ARROW
- 7 4" WIDE PARKING STRIPE
- 8 MENU BOARD
- 9 DRIVE-THRU CALL BOX
- 10 HEIGHT RESTRICTION POLE
- 11 WHEEL STOP



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

CULVERS W OAKS DRIVE AT NOVI ROAD NOVI, MI 48137		SITE PLAN				SCALE AS NOTED DESIGNED BY: TES DRAWN BY: LDF CHECKED BY: TES		Kimley-Horn of Michigan, Inc. 12004 JIMBLESTONE OF MICHIGAN SOUTHFIELD, MI 48034 (248) 349-1000 WWW.KIMLEY-HORN.COM		Δ CITY OF NOVI – RESUBMISSION 06/16/24 LF	
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presented in this document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kinley-Horn and Associates, Inc., shall be without liability to Kinley-Horn and Associates, Inc.



- ## STORMWATER MANAGEMENT SUMMARY

THE EXISTING SITE DRAINAGE PATTERN FLOWS FROM NORTHEAST TO SOUTHWEST, ULTIMATELY DISCHARGING INTO W OAKS DRIVE. THE ENTIRE SITE'S STORMWATER WILL BE CAPTURED AND MANAGED THROUGH A COMPREHENSIVE STORM SEWER SYSTEM.

STORMWATER CONVEYANCE AND TREATMENT:

INTEGRATED STORM SEWER SYSTEM: THE FULL SITE'S STORMWATER RUNOFF WILL BE COLLECTED BY STORM SEWER.

ADS BARRACUDA MAX SYSTEM: THE PRIMARY TREATMENT AND MANAGEMENT OF STORMWATER WILL BE FACILITATED BY THE ADS BARRACUDA MAX STRUCTURE. THIS SYSTEM IS SELECTED FOR ITS EFFICIENCY IN TREATING STORMWATER, PARTICULARLY FOR THE CRITICAL FIRST FLUSH VOLUME, WHICH IS OFTEN THE MOST POLLUTED.

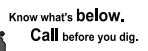
FIRST FLUSH VOLUME MANAGEMENT: SPECIAL ATTENTION IS GIVEN TO TREATING THE FIRST FLUSH VOLUME, WHICH CARRIES A SIGNIFICANT AMOUNT OF POLLUTANTS. THE ADS BARRACUDA MAX SYSTEM IS DESIGNED TO EFFECTIVELY TREAT THIS INITIAL RUNOFF, ENHANCING THE OVERALL QUALITY OF DISCHARGED WATER.

FLOW RATE CONTROL: THE SYSTEM IS CALIBRATED TO MANAGE A DISCHARGE RATE OF 0.15 CUBIC FEET PER SECOND (CFS) PER ACRE. THIS CONTROLLED RATE HELPS IN MITIGATING POTENTIAL EROSION AND FLOODING ISSUES DOWNSTREAM AND ENSURES COMPLIANCE WITH LOCAL STORMWATER MANAGEMENT STANDARDS.

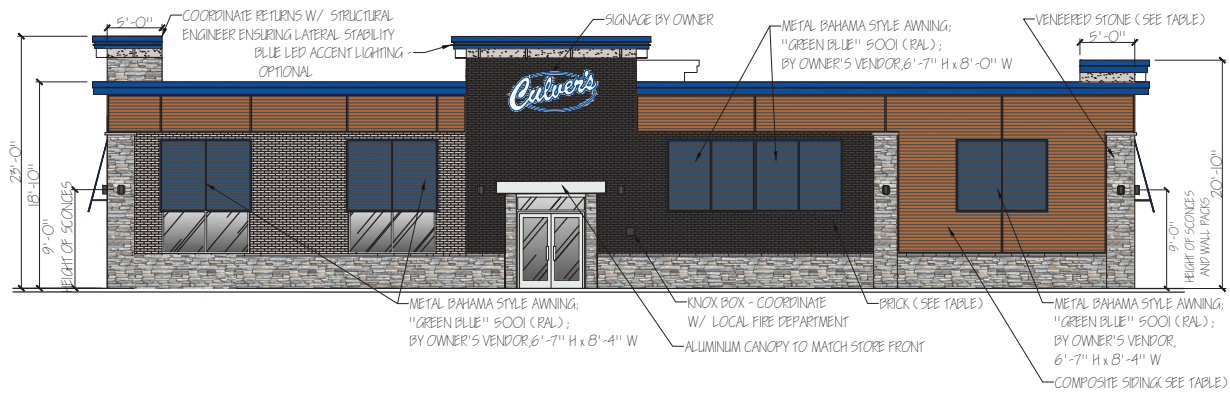
CONNECTION TO EXISTING INFRASTRUCTURE: THE TREATED STORMWATER WILL BE DISCHARGED INTO THE EXISTING STORMWATER INFRASTRUCTURE LOCATED IN W OAKS DRIVE. THIS CONNECTION IS DESIGNED TO SEAMLESSLY INTEGRATE WITH THE EXISTING MUNICIPAL STORMWATER SYSTEM, ENSURING EFFICIENT MANAGEMENT OF SITE RUNOFF.

OVERALL STORMWATER MANAGEMENT DESIGN:

THE STORMWATER MANAGEMENT SYSTEM, INCLUSIVE OF THE ADS BARRACUDA MAX, IS DESIGNED TO UPDATE AND ENHANCE THE SITE'S DRAINAGE PATTERNS. IT ALIGNS WITH THE CURRENT STANDARDS SET BY THE OAKLAND COUNTY WATER RESOURCE DIVISION.



ORIGINAL ISSUE: 05/15/2024 KHA PROJECT NO. 268693000 SHEET NUMBER C6.0		CULVERS W OAKS DRIVE AT NOV1 ROAD NOV1, MI 48137		STORMWATER MANAGEMENT				Kimley-Horn of Michigan, Inc. 55024 KIMLEY-HORN OF MICHIGAN 1500 YORK CENTER, SUITE 1000 ANN ARBOR, MI 48106 PHONE: 734-461-5500 FAX: 734-461-5500 WWW.KH-USA.COM		DATE: 05/15/24 BY: RV	
						SCALE: AS NOTED		DESIGNED BY: TES		NOV1	
						DRAWN BY: LUP		1500 YORK CENTER, SUITE 1000 ANN ARBOR, MI 48106 PHONE: 734-461-5500 FAX: 734-461-5500 WWW.KH-USA.COM		CITY OF NOV1 - RESUBMISSION	
						CHECKED BY: TES		NO		DATE: 05/15/24	



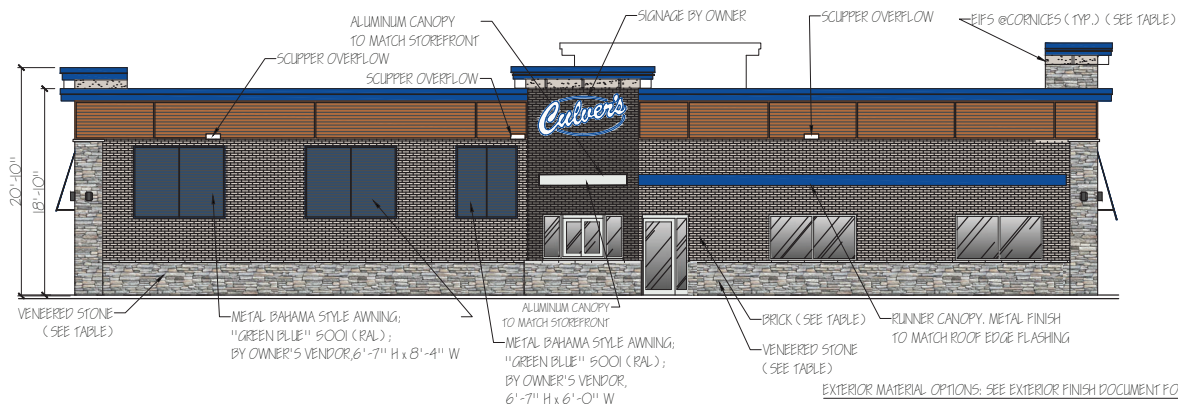
BAHAMA STYLE AWNINGS
(OWNER SUPPLIED/ VENDOR INSTALLED)

QUANTITIES:

- 5 - METAL AWNINGS @ 6'-7" H x 8'-4" W x 2'-0" D
- 4 - METAL AWNINGS @ 6'-7" H x 8'-0" W x 2'-0" D
- 3 - METAL AWNINGS @ 6'-7" H x 6'-0" W x 2'-0" D
- 1 - METAL AWNING @ 5'-6" H x 6'-0" W x 2'-0" D
- 13 - TOTAL

METAL AWNING COLOR SPECIFICATIONS:

- "GREEN BLUE" SOOI (RAL) BY OWNER'S VENDOR



EXTERIOR MATERIAL OPTIONS: SEE EXTERIOR FINISH DOCUMENT FOR SELECTIONS

GENERAL NOTES:

- METAL COMPRESSION EDGE AT PARAPET COLOR: "HARBOR BLUE"
- DO NOT DRYSTACK CULTURED STONE

MATERIAL OPTIONS:

STONE:

- ENVIRONMENTAL STONEMWORKS, STYLE: TUSCAN LEDGE, COLOR: "ANDES SUMMIT" OR
- BORAL STONE, STYLE: COUNTRY LEDGESTONE, COLOR: MATCH "ANDES SUMMIT"

COMPOSITE CLADDING:

- NEWTECHWOOD, "ULTRASIELD NATUREL" WOOD-LOOK CLADDING, COLOR: "BRAZILIAN IPE"

SILL & ACCESSORIES:

- COORDINATE COLOR PER MFG. RECOMMENDATION, FLAT LIGHT STONES TO BE USED AT SCONE FIXTURES

MAIN FIELD MATERIAL:

- BRICK: MEDIUM SAND FINISH. COLOR: SW6071 "POPULAR GRAY"

TOWERS & ENTRY ACCENT:

- BRICK: MEDIUM SAND FINISH, COLOR: SW7019 "GAUNTLET GRAY" (DARK COLOR)
- E.I.F.S. @ CORNICE: MEDIUM SAND FINISH. COLOR: SW6071 "POPULAR GRAY"

OTHER EXTERIOR BUILDING FINISHES

EXTERIOR HOLLOW METAL: PAINT TO MATCH "GAUNTLET GRAY"

REMOVABLE MULLION: SILVER, TO MATCH ALUMINUM

BOLLARD COVER: ACCESSIBLE BLUE

ALUMINUM FRAMES & DOORS: CLEAR ANODIZED FINISH

TRANSITION BASE FLASHING: PREFINISHED, MATCH UPPER MATERIAL

ROOF LADDER: MILL FINISH, ALUMINUM

LIGHT FIXTURES: SEE ELECTRICAL

CLADDING ALTERNATE

IN LIEU OF ULTRASIELD COMPOSITE CLADDING, PROVIDE LONGBOARD CLADDING SYSTEM COMPLETE W/ MFG. CLIPS & TRIMS. INSTALL ON FLOORING STRIPS PER MANUFACTURER SPECIFICATIONS.

S.P.A.
EXTERIOR ELEVATIONS
PROJECT No. 230626
DRAWN BY: JMV
DATE: 12.27.2023

A-3



Metro - M
NOVI, MICHIGAN

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NORTHEAST VIEW



SOUTHEAST VIEW



SOUTHWEST VIEW



NORTHWEST VIEW



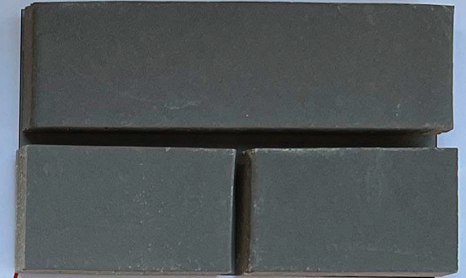
STONE:
ENVIRONMENTAL STONWORKS
STYLE: TUSCAN LEDGE
COLOR: ANDER'S SUMMIT
FACADE PERCENT:
FRONT: 32.4 ft = 32%
ENTRANCE SIDE: 29.9 ft = 20%
REAR: 38.9 ft = 18%
DRIVE-THRU SIDE: 34.0 ft = 19%



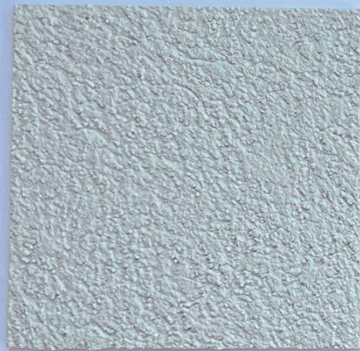
COMPOSITE CLADDING:
NEWTECH-WOOD
STYLE: 1/4" TROBRED NATURAL
WOOD-LOOK CLADDING
COLOR: BRANGLAN PE
FACADE PERCENT:
FRONT: 36.4 ft = 5%
ENTRANCE SIDE: 48.3 ft = 26%
REAR: 75.4 ft = 8%
DRIVE-THRU SIDE: 29.2 ft = 16%



MAIN FIELD MATERIAL:
FACEBRICK
STYLE: MEDIUM SAND FINISH
COLOR: SWIFT POPPY GRAY
GROUT: MAPLE / SAVANNA BEIGE
FACADE PERCENTAGE:
FRONT: 118.4 ft = 17%
ENTRANCE SIDE: 267.4 ft = 14%
REAR: 256.4 ft = 27%
DRIVE-THRU SIDE: 7.8 ft = 40%



ACCENT FIELD MATERIAL:
FACEBRICK
STYLE: MEDIUM SAND FINISH
COLOR: SWIFT GAULET GRAY
GROUT: MAPLE / PINEAPPLE
FACADE PERCENTAGE:
FRONT: 127.4 ft = 18%
ENTRANCE SIDE: 458.4 ft = 25%
REAR: 23.4 ft = 7%
DRIVE-THRU SIDE: 120.4 ft = 7%



CORNICE MATERIAL:
STD-EX-EIFS
STYLE: MEDIUM TEXTURE
COLOR: SWIFT POPPY GRAY
FACADE PERCENTAGE:
FRONT: 32.4 ft = 3%
ENTRANCE SIDE: 21.4 ft = 1%
REAR: 30.4 ft = 7%
DRIVE-THRU SIDE: 17.4 ft = 1%



PLANNING REVIEW



PLAN REVIEW CENTER REPORT

Planning Review

Culver's

JSP 23-37

June 4, 2024

PETITIONER

UPH Novi Property, LLC

REVIEW TYPE

2nd Revised Preliminary Site Plan with Planned Development 2 Option, Special Land Use Request, and a Street Vacation Request

PROPERTY CHARACTERISTICS

Section	15	
Site Location	West of Novi Road, north of West Oaks Drive, 22-15-200-097 and -099	
Site School	Novi Community School District	
Site Zoning	RC Regional Commercial with a PD-2 Option	
Adjoining Zoning	North	RC Regional Commercial
	East	RC Regional Commercial
	West	RC Regional Commercial
	South	RC Regional Commercial
Current Site Use	Vacant, bisected by North Karevich Drive	
Adjoining Uses	North	Value City Furniture
	East	Former bank (now vacant)
	West	Salon
	South	Parking for West Oaks
Site Size	1.69 acres	
Plan Date	June 23, 2023	

PROJECT SUMMARY

The applicant is proposing to construct a Culver's restaurant with a drive-thru. North Karevich Drive is requested to be vacated, and the plan shows that a new private drive will be relocated through the restaurant site so that one can still drive from West Oaks Drive to North Karevich Drive in front of the Value City Furniture.

The subject property is currently vacant land zoned RC, Regional Commercial, with a Planned Development, PD-2 Option overlay. The land comprises approximately 1.4 acres as two parcels bisected by North Karevich Drive but is proposed to comprise approximately 1.69 acres if the site plan, street vacation, and parcel combination are approved. The site is located west of Novi Road, north of West Oaks Drive in Section 15.

In its recommendation to the City Council, the Planning Commission will also need to consider the standards for Special Land Use consideration as well as the standards of the site plan review section of the Planned Development option, as detailed in this letter. As a part of this request, the City Council will consider whether to vacate a portion of North Karevich Drive, and consider the terms under which the property could be conveyed to the applicant.

RECOMMENDATION

Approval of the Second Revised Preliminary Site Plan is recommended by staff. All reviewers now recommend approval of the Preliminary Site Plan. Façade recommended approval of the initial Preliminary Site Plan and although Landscape, Engineering, and Fire previously approved the revised Preliminary Site Plan, another review was warranted due to the change in layout of the site. Traffic is now recommending approval of both the site plan and Traffic Impact Study, with comments to be addressed on the Final Site Plan.

PLANNED DEVELOPMENT OPTION CONDITIONS

Section 3.31.4 of the ordinance outlines the review procedures for Preliminary Site Plans using the PD-2 Option. This requires the Preliminary Site Plan to receive a recommendation for approval or denial from the Planning Commission with City Council ultimately approving or denying the proposed plan. It also outlines specific factors the Planning Commission and City Council shall consider in the review:

1. The plan meets all the requirements of Section 6.1 of this Ordinance for Preliminary Site Plans and the requirements set forth in the City's Site Plan and Development Manual. **The plan meets most requirements except the deviations as noted in the review letters.**
2. The plan satisfies the intent of the Special Land Use provisions as stated in Section 6.1.2.c. **See the Special Land Use Considerations noted in this Plan Review Letter.**
3. The Community Impact Statement and Traffic Study are provided, regardless of site size, in accordance with the requirements set forth in the City's Site Plan and Development Manual. **The applicant has provided Community Impact Statement and Traffic Impact Study – see Traffic review letter for further details.**
4. The plan satisfies the intent of this Section with respect to use of the land and principal and accessory use relationships within the site as well as with uses on adjacent sites.
5. That all existing or proposed streets, road, utilities and marginal access service drives, as are required, are correctly located on the site plan in accordance with the approved plans for these improvements. **See the attached Engineering and Traffic Review Letter for additional information.**
6. The plan meets all the applicable standards of this Ordinance relative to height, bulk and area requirements, building setbacks, off-street parking and preliminary site engineering requirements. **The plan is in general conformance with the code requirements. See the attached Plan Review Chart for additional information.**
7. That there exists a reasonable harmonious relationship between the location of buildings on the site relative to buildings on lands in the surrounding area; that there is a reasonable architectural and functional compatibility between all structures on the site and structures within the surrounding area to assure proper relationships between:
 - a. The topography of the adjoining lands as well as that of the site itself including any significant natural or manmade features. **Street relocation proposed.**
 - b. The relationship of one building to another whether on-site or on adjacent land, i.e., entrances, service areas and mechanical appurtenances.
 - c. The rooftops of buildings that may lie below street levels or from windows of higher adjacent buildings.
 - d. Landscape plantings, off-street parking areas and service drives on adjacent lands. **Landscape generally conforms to the requirements. See the Landscape Review Letter for additional information.**
 - e. Compliance with street, road and public utility layouts approved for the area. **See the Engineering and Traffic Review Letters for additional information.**

- f. The architecture of the proposed building including overall design and façade materials used. Architectural design and façade material are to be complimentary to existing or proposed buildings within the site and the surrounding area. It is not intended that contrasts in architectural design and use of façade materials is to be discouraged, but care shall be taken so that any such contrasts will not be so out of character with existing building designs and façade materials so as to create an adverse effect on the stability and value of the surrounding area. **See the Façade Review Letter for additional information.**

Section 3.31.4.B indicates the City Council shall review the proposed plan considering the Planning Commission's recommendation and the requirements of Section 3.31.4.A. As part of its approval of the Preliminary Site Plan, the Council is permitted to impose conditions that are reasonably related to the purposes of this section and that will:

1. Insure that public services and facilities affected by a proposed land use or activity will be capable of accommodating increased services and facility loads caused by the land use or activity;
2. Protect the natural environment and conserving natural resources and energy;
3. Insure compatibility with adjacent use of land; and
4. Promote the use of land in a socially and economically desirable manner.

SPECIAL LAND USE CONSIDERATIONS

When the PD-2 Option is utilized, all uses fall under the Special Land Use requirements. Section 6.1.2.C of the Zoning Ordinance outlines specific factors the Planning Commission shall consider in the review and recommendation to City Council of the Special Land Use Permit request:

- i. Whether, relative to other feasible uses of the site, the proposed use will cause any detrimental impact on existing thoroughfares in terms of overall volumes, capacity, safety, vehicular turning patterns, intersections, view obstructions, line of sight, ingress and egress, acceleration/deceleration lanes, off-street parking, off-street loading/unloading, travel times and thoroughfare level of service.
- ii. Whether, relative to other feasible uses of the site, the proposed use will cause any detrimental impact on the capabilities of public services and facilities, including water service, sanitary sewer service, storm water disposal and police and fire protection to service existing and planned uses in the area.
- iii. Whether, relative to other feasible uses of the site, the proposed use is compatible with the natural features and characteristics of the land, including existing woodlands, wetlands, watercourses and wildlife habitats.
- iv. Whether, relative to other feasible uses of the site, the proposed use is compatible with adjacent uses of land in terms of location, size, character, and impact on adjacent property or the surrounding neighborhood.
- v. Whether, relative to other feasible uses of the site, the proposed use is consistent with the goals, objectives and recommendations of the City's Master Plan for Land Use.
- vi. Whether, relative to other feasible uses of the site, the proposed use will promote the use of land in a socially and economically desirable manner.
- vii. Whether, relative to other feasible uses of the site, the proposed use is
 - a. Listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and
 - b. Is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located.

ORDINANCE REQUIREMENTS

This project was reviewed for compliance with the Zoning Ordinance, with respect to Article 3 (Zoning Districts), Article 4 (Use Standards), Article 5 (Site Standards), and any other areas of the ordinance, as

noted. The plans show general compliance with ordinance requirements. Please address the items in **bold** with the next submittal.

1. Criteria for authorizing deviations (Sec. 3.31.5): The City Council shall be authorized to grant deviations from the strict terms of the zoning ordinance governing area, bulk, yard, and dimensional requirements applicable to the property" in accordance with section 3.31.5. The standards are as follows):
 - a. *That each zoning ordinance provision from which a deviation is sought would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest;*
 - b. *That approving the proposed deviation would be compatible with the existing and planned uses in the surrounding area;*
 - c. *That the proposed deviation would not be detrimental to the natural features and resources of the affected property and surrounding area, or would enhance or preserve such natural features and resources;*
 - d. *That the proposed deviation would not be injurious to the safety or convenience of vehicular or pedestrian traffic; and*
 - e. *That the proposed deviation would not cause an adverse fiscal or financial impact on the City's ability to provide services and facilities to the property or to the public as a whole.*
2. Fast-food Restaurants (Sec. 3.31.7.B.v.a): Fast food restaurants are allowed as a special land use when using the PD-2 option in the RC district, subject to certain conditions, namely that
 - a. No restaurants shall be closer than 1,000 feet on the same side of the street. The subject property is within 1,000 feet of another restaurant, as both Carrabba's to the south and Starbucks to the north are within 1,000 feet. **The applicant will be asking for a deviation from this standard, based on the criteria provided in item 1.**
 - b. The parcel must be at least 1.25 acres (site is 1.69 acres); and
 - c. The site shall be designed to achieve traffic circulation features both within the site and in relation to access streets that assure safety and convenience of both vehicular and pedestrian traffic. Please see the Traffic Engineering Review letter for comment on this.
3. Street vacation request: The submitted site plan's approval will be contingent on the successful approval of the requested street vacation. The street vacation request will be reviewed separately with a public hearing at an upcoming City Council meeting. As the public street was not designed as a part of a plat, but was conveyed to the City by a deed, the vacated land does not automatically go to the adjacent property owner. **The applicant has proposed to vacate the part of Karevich Drive that is intended to be moved in addition to the portion of Karevich Drive north of the site that is in front of Value City Furniture. The applicant has proposed to take on the maintenance responsibilities for the vacated street and maintain public access, in addition to constructing a sidewalk along Novi Road from West Oaks Drive to West Oaks Access Drive. The applicant has begun to prepare a formal letter for the street vacation proposal including the dedicated ROW, maintenance responsibilities, and other required details.**
4. Dumpster (Sec. 4.19.2): All exterior side yards abutting a street shall meet the regulations applicable to a front yard. Dumpsters may only be located in the rear yard. **Dumpster location will require a deviation. Acknowledged by the applicant.**
5. Parking adjacent to parking lot entrance (Sec. 5.3.13): No parking stall located adjacent to a parking lot entrance from a street (public or private) shall be located closer than 25 feet from the street ROW line, easement, or sidewalk, whichever is closer. The parking stall in the northwest corner of the lot appears closer than 25 feet from the parking lot entrance. **Please either revise the layout so that space is shifted to the east or request a deviation.**

Additionally, there appears to be a claim in the response letter that no parallel parking spaces are proposed, even though all the spaces in front of the pick up window on either side of the drive aisle are parallel parking spaces (even if the spaces on the north side of the drive aisle are considered waiting spaces and not parking spaces). **Please either 1) eliminate these spaces altogether, 2) dimension the parallel spaces so that they comply with the Ordinance (23' in length, 8' in width, with 6' long hatched spaces in between every other space as detailed in Section 5.3.2 of the Ordinance) or 3) seek a deviation from the Ordinance for the current layout or 4) some combination of eliminations, deviations, and proper dimensions, which can be outlined by the applicant in the next response letter. See Traffic Review for further detail.**

6. Consecutive parking spaces (Sec. 5.5.3.C): The bay just north of the building is in effect 17 spaces (the dumpster access way is 2 spaces), plus 2 accessible space aisles extend the bay even further. **Please add in a 200sf island on the east or west side of the dumpster accessway. See Landscape letter for further detail.**
7. Bicycle Parking General Requirements (Sec. 5.16): Proposed dimensions are not in compliance with the Ordinance. **Please revise the bicycle parking layout so that it meets the requirements from Text Amendment 18.301. Please also dimension the width of the sidewalk from the crosswalk to the bicycle parking to ensure that the 6' requirement is met. See Traffic review letter for further detail.**
8. Traffic Circulation (Sec. 3.31.7.B.v.c): The site plan shall be designed to achieve traffic circulation features both within the site and in relation to access streets that assure safety and convenience of both vehicular and pedestrian traffic. **A deviation will be required for the mountable concrete median drive approach. Additionally, please revise sheet C5.4 to show the correct path of the fire truck. See Traffic review for further detail.**
9. Signage: For sign permit information please contact Ordinance Enforcement at 248-735-5678 or ordinanceenforcement@cityofnovi.org in the Code Compliance Division for more information.
10. Planning Chart: Please be sure to address the other issues included in the attached Planning Chart.

OTHER REVIEWS

- a. Engineering Review (6-6-2024): Engineering recommends approval of the 2nd revised Preliminary Site Plan, with comments to be addressed at the time of Final Site Plan submittal.
- b. Landscape Review (6-4-2024): Landscape recommends approval of the 2nd revised Preliminary Site Plan, on the condition that the three unsupported waivers are eliminated.
- c. Traffic Review (6-4-2024): Traffic recommends approval of the 2nd revised Preliminary Site Plan and the Traffic Impact Study. There are comments that need to be addressed in a response letter in addition to the Final Site Plan.
- d. Facade Review (1-8-2024): Façade recommended approval of the initial Preliminary Site Plan. A Section 9 Façade waiver is required for an underage of brick and overage of composite siding.
- e. Fire Review (6-3-2024): Fire recommended approval of the 2nd Revised Preliminary Site Plan, with comments to be addressed at Final Site Plan.
- f. Irrigation Review (6-7-2024): The Water and Sewer Division is not recommending approval of the irrigation plan currently. Their comments will need to be addressed in the Final Site Plan submittal.

NEXT STEP: PLANNING COMMISSION AND RESPONSE LETTER

The Preliminary Site Plan, Special Land Use, and Stormwater Management Plan will need approval from the Planning Commission. The project is scheduled to appear before the Planning Commission on **June 26, 2024, at 7pm at the Novi Civic Center**. Please provide the following via email the week prior to the meeting once this stage is reached:

1. Site Plan submittal in PDF format (maximum of 10MB) **NO CHANGES MADE (we have this already)**
2. A response letter addressing ALL the comments from ALL review letters and a request for waivers/variances as you see fit.
3. A color rendering of the Site Plan (to be used for Planning Commission presentation).

FUTURE STEP: CITY COUNCIL FOR PRELIMINARY SITE PLAN AND STREET VACATION

After the Planning Commission meeting, the site plan and street vacation will concurrently appear before the City Council. Any deviations from the Zoning Ordinance that pertain to bulk, area, and dimensions will need to be granted by the City Council.

FUTURE STEP: FINAL SITE PLAN SUBMITTAL

After receiving City Council's approval of the Special Land Use, Preliminary Site Plan, and Stormwater Management Plan and any necessary deviations, please submit the following for review:

1. **Six** copies of Final Site Plan sets (24" x 36", folded) addressing ALL comments from Preliminary Site Plan Review.
2. Response letter addressing ALL comments from ALL review letters and **refer to sheet numbers where the change is reflected.**
3. [Final Site Plan Application](#)
4. [Final Site Plan Checklist](#)
5. [No Revision Façade Affidavit](#) (only if no façade changes have been made)
6. An itemized engineering cost estimate including sanitary sewer, watermain, storm sewer, paving and grading costs, size 8.5" x 11" (The cost estimate should not include soil erosion or demolition costs.)
7. An itemized landscaping cost estimate including greenbelt and greenbelt ornamental trees, perennials, pond plantings, shrubs, edging, mulch, seed mix and seeded lawn, size 8.5" x 11" (The cost estimate should not include woodland trees, replacement trees or mitigation.)
8. [Other Agencies Checklist](#)
9. [Non-Domestic User Survey](#)
10. [Hazardous Chemical Survey](#)

ELECTRONIC STAMPING SET SUBMITTAL AND RESPONSE LETTER

After receiving Final Site Plan approval, plans addressing the comments in all the staff and consultant review letters should be submitted electronically for informal review and approval prior to printing Stamping Sets. A letter from either the applicant or the applicant's representative addressing comments in this and other review letters and associated charts is to be submitted with the electronic stamping set. This letter should address all comments in ALL letters and ALL charts and **refer to sheet numbers where the change is reflected.** *If required, drafts for all legal documents with a legal transmittal are to be submitted along with stamping sets.*

STAMPING SET APPROVAL

Stamping sets will be required for this project. After having received all the review letters from City staff the applicant should make the appropriate changes on the plans and submit **9 size 24" x 36" copies with signature and seal (may be electronic)** to the Community Development Department for final Stamping Set approval.

PRE-CONSTRUCTION MEETING

A **Pre-Construction meeting is required for this project.** Prior to the start of any work on the site, Pre-Construction (Pre-Con) meetings must be held with the applicant's contractor and the City's consulting engineer. Pre-Con meetings are generally held after Stamping Sets have been issued and prior to the start of any work on the site. There are a variety of requirements, fees and permits that must be issued before a Pre-Con can be scheduled, so it is suggested you contact Sarah Marchioni (248.347.0430 or

smarchioni@cityofnovi.org) once the Final Site Plan has been approved to begin the Pre-Con checklist. If you have questions regarding the checklist or the Pre-Con itself, please contact Sarah.

CHAPTER 26.5

Chapter 26.5 of the City of Novi Code of Ordinances generally requires all projects be completed within two years of the issuance of any starting permit. Please contact Sarah Marchioni at 248-347-0430 for additional information on starting permits. The applicant should review and be aware of the requirements of Chapter 26.5 before starting construction.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.347.0547 or jhill@cityofnovi.org.



James Hill, Planner



PLANNING REVIEW CHART: RC with PD-2 Option

Review Date: June 4, 2024
Review Type: Revised Preliminary Site Plan
Project Name: JSP 23-37 Culver's Restaurant
Plan Date: May 15, 2024
Prepared by: James Hill, Planner
E-mail: jhill@cityofnovi.org; **Phone:** (248) 347-0547

Items in **Bold** need to be addressed by the applicant with next submittal. Underlined items need to be addressed on the Stamping set submittal.

Item	Required Code	Proposed	Meets Code	Comments
Zoning and Use Requirements				
Master Plan (adopted July 27, 2017)	Regional Commercial	PD-2: Planned Development	Yes	PD-2 Option would require the Planning Commission's recommendation to City Council – concurrent with site plan/special land use
Area Study	None		NA	
Zoning (Effective January 8, 2015)	RC: Regional Commercial	RC with PD-2 Option	Yes	
Uses Permitted (Sec 3.1.24. B & C)	Sec 3.1.24.B Principal Uses Permitted. Sec 3.1.24.C Special Land Uses	Restaurant: Fast food drive-through	Yes	Subject to City Council approval upon Planning Commission's recommendation The public hearing from the previous Planning Commission meeting remained open so a notice is not required
Phasing	Provide phases lines and detail description of activities in each phase	Phasing not proposed	NA	
Planned Development Site Plan Submittal Requirements (Sec. 3.31.4.A)				

Item	Required Code	Proposed	Meets Code	Comments
Special Land Use (Sec. 3.31.4.A.ii)	Special Land use requirements listed in Sec. 6.1.2.C.		Yes	
Community Impact Statement (Sec. 3.31.4.A.iii)	Required according to site plan manual (SDM link: Site development Manual)	Included	Yes	
Traffic Study (Sec. 3.31.4.A.iii)	Required according to site plan manual (SDM link: Site development Manual)	Included	Yes	
Planning Commission Findings for Site plan review (Sec. 3.31.4.A)	The proposed site plan meets the intent of other items listed in Section		TBD	PD Option and PSP can proceed simultaneously – Review conditions listed in this section
Use Conditions for Allowable uses under PD-2 Option (Sec. 3.31.7.B)				
Fast food drive-thru (Sec. 3.31.7.B.v.a)	When restaurants are independently freestanding uses and not attached to or otherwise clearly accessory to a principle use, they shall be located no closer than one-thousand (1,000) feet from any other such use on the same side of the street	Carabba's (south of site) appears to be closer than 1000 feet	No	Deviation will be required Deviation will be subject to the Planning Commission's recommendation, which will then go to City Council for approval
Minimum parcel size (Sec. 3.31.7.B.v.b)	1.25 acres.	1.4 acres as two separate parcels 1.69 acres proposed	Yes	
Traffic Circulation (Sec. 3.31.7.B.v.c)	The site plan shall be designed to achieve traffic circulation features both within the site and in relation to access streets that assure safety and convenience of both vehicular and pedestrian traffic.	Traffic recommends approval	Yes	See Traffic Review for comments Deviation required for mountable concrete median drive approach Sheet C5.4 shows the fire truck path through parking spaces – please revise

Item	Required Code	Proposed	Meets Code	Comments
Restaurant in the Character of a Fast Food Carryout, Drive-In, Fast Food Drive-Through, or Fast Food Sit Down (Sec. 4.40.)				
Noise Impact Statement (Sec. 4.40.1)	A noise impact statement is required subject to the standards of Sec. 5.14.10.B.	Included	Yes	
Drive-through Lanes (Sec. 5.3.11)				
Drive-through Lanes Separation (Sec. 5.3.11.A)	Drive-through lanes shall be separate from the circulation routes & lanes necessary for ingress to & egress from the property	Shown		
Drive-through setbacks (Sec. 5.3.11.A,B)	Drive through shall follow parking setback requirements and applicable parking lot landscaping requirements	Complies	Yes	
Drive-through lanes parking access (Sec. 5.3.11.C)	Drive-through lanes shall not utilize any space which is necessary for adequate access to parking spaces from internal maneuvering lanes	20' one-way maneuvering lane along drive thru lane	Yes	See Traffic Review for further details
Bypass Lane for Drive-through (Sec. 5.3.11.D)	Drive-through facilities shall provide 1 bypass lane, min. of 18 ft. in width, unless otherwise determined by the Fire Marshal	Bypass lane shown to be 20 feet wide	Yes	
Width & Centerline Radius of Drive-through Lanes (Sec. 5.3.11.E,F,H)	Drive-through lanes shall have a minimum 9 ft. width, centerline radius of 25 ft. and a minimum length of 19 ft.	10 ft wide 25 ft centerline radius	Yes	See Traffic Review for additional comments
Drive-Thru Stacking Spaces (Sec. 5.3.11.I)	The distance between the order board and the pick-up window shall store four (4) vehicles, and four (4) vehicles shall be stored in advance of the menu board (not including the vehicles at the pick-up window and menu	Two menu boards shown Cars sketched in to show stacking	Yes	See Traffic Review for additional comments – although sketches are provided, please dimension the length of the stacking space

Item	Required Code	Proposed	Meets Code	Comments
	board).			
Drive-through Lane Delineated (Sec. 5.3.11.G)	Drive-through lanes shall be striped, marked, or otherwise delineated	Appears to comply Drive-through lane delineated by concrete pavement	Yes	
Height, bulk, density and area limitations (Sec 3.1.23.D)				
Frontage on a Public Street (Sec. 5.12) Access To Major Thoroughfare (Sec. 5.13)	Frontage on a Public Street is required.	Frontage on W Oaks Drive and Novi Road	Yes	
Minimum Zoning Lot Size for each Unit in Acres (Sec 3.6.2.D)	Except where otherwise provided in this Ordinance, the minimum lot area and width, and the maximum percent of lot coverage shall be determined on the basis of off-street parking, loading, greenbelt screening, yard setback, or usable open space.		NA	
Minimum Zoning Lot Size for each Unit: Width in Feet (Sec 3.6.2.D)			NA	
Open Space Area	-----	-----	NA	
Maximum % of Lot Area Covered (By All Buildings)	(Sec 3.6.2.D)	Building lot coverage: 5.6%	Yes	
Building Height (Sec. 3.20)	45 ft. or 3 stories whichever is less	23 ft	Yes	
Outdoor Restaurants (Sec. 4.84)				
Accessory Use (Sec. 4.84)	Outdoor seating as an accessory use is allowed per section 4.84.	315 sq ft exterior seating area	Yes	
Site Plan Review (Sec. 4.84.1)	If the seating area is proposed as part of a site plan application it shall require site plan review and approval by the Planning Commission		TBD	
Building and fire	Outdoor seating areas shall		TBD	

Item	Required Code	Proposed	Meets Code	Comments
codes (Sec. 4.84.1)	also comply with all applicable building and fire codes			
Timings (Sec. 4.84.2)	Permitted between March 1 st and November 30 th .	Details included	Yes	
Pathway (Sec. 4.84.4)	Outdoor seating areas shall be located in a manner to maintain a minimum pathway width of six (6) feet (clear of structures such as light poles, trees and hydrants) along the sidewalk	315 sq ft patio area	Yes	
Enclosure (Sec. 4.84.4)	It shall be enclosed where there is alcohol service.		NA	
Location (Sec. 4.84.5)	If located in public, ROW, then approval from all relate agencies is required. Additional requirements may apply.		NA	
Parking (Sec. 4.84.6)	For more than 20 seating, parking shall be calculated.	Approximately 15 seats appear to be shown	Yes	
Hours of Operation (Sec. 4.84.7)	Hours of operation same as inside restaurant.	To be provided with FSP submittal	TBD	
Building Setbacks (Sec 3.31.7.D)				
Front @ W Oaks Drive (South)	50 ft.	50.52 ft	Yes	
Exterior side yard @ Novi Road (East)	50 ft	80.52 ft	Yes	
Exterior side yard @ N Karevich Drive (North)	50 ft	114.88 ft	Yes	
Exterior Side Yard @ N Karevich Dr (West)	50 ft.	161.78 ft	Yes	
Parking Setback (Sec 3.31.7.D)				
Front @ W Oaks Drive (South)	20 ft.	21 ft	Yes	
Exterior side yard @ N Karevich Drive (West)	20 ft.	Greater than 20 ft.	Yes	
Exterior side yard @ N Karevich Drive (North)	20 ft.	20.8 ft.	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Exterior Side Yard @ Novi Road (East)	20 ft.	20.9 ft.	Yes	
Note To District Standards for RC District (Sec 3.6.2)				
Exterior Side Yard Abutting a Street (Sec 3.6.2.C)	All exterior side yards abutting a street shall be provided with a setback equal to front yard.	Shown	NA	See comments above
Off-Street Parking in Front Yard (Sec 3.6.2.E)	Off-street parking is allowed in front yard.	Shown	Yes	
Distance between buildings (Sec 3.6.2.H)	It is governed by sec. 3.8.2 or by the minimum setback requirements, whichever is greater.	Only one building proposed	NA	
Wetland/Watercourse Setback (Sec 3.6.2.M)	A setback of 25ft from wetlands and from high watermark course shall be maintained.	No wetlands present	NA	
Additional Building height (Sec 3.6.2.O)	Additional height up to 65 ft. may be allowed for properties within 1200 ft from a freeway subject to additional conditions		NA	
Parking setback screening (Sec 3.6.2.P)	Required parking setback area shall be landscaped per sec 5.5.3.	Landscape plan provided	TBD	See Landscape Review
Modification of parking setback requirements (Sec 3.6.2.Q)	The Planning Commission may modify parking setback requirements based on its determination according to Sec 3.6.2.Q.	Does not apply	NA	
Parking, Loading and Dumpster Requirements				
Number of Parking Spaces Sec. 5.2.12.C	Fast Food Restaurants 1 for every 2 employees, plus 1 for every 2 customers allowed under maximum capacity (including waiting areas)	6 employees per shift: 3 spaces 90 seats: 45 spaces Total required: 3+ 45 = 48 Total provided: 53 (according to site data table)	Yes	See Traffic Review for additional comments Since 8 spaces are provided in excess, the applicant could consider removing the parallel parking spaces in front of the pickup window on either side of the drive aisle for better traffic flow

Item	Required Code	Proposed	Meets Code	Comments
		It appears that 56 spaces are provided		
Parking Space Dimensions and Maneuvering Lanes (Sec. 5.3.2)	<u>90° spaces</u> : 9 ft. x 19 ft. parking spaces with 24 ft. drives	9 ft x 19 ft proposed with 24 ft. drive	Yes	See Traffic Review for additional comments Also see comment above
	<u>45° spaces</u> : 9 ft. x 18 ft. with 15 ft. drives	15 spaces, 9 ft. wide x 18 ft. with 20 ft. drive	Yes	
	9 ft. x 17 ft. parking spaces along 7 ft. interior sidewalks, provided a 4 in. curb at these locations & along landscaping	19 spaces, 9ft. x 17 ft, not along sidewalk	Yes	
	<u>0° Parallel parking spaces</u> : 8 ft x 23 ft with 13 ft drives and 6 ft buffers	Varied lengths for parallel parking spaces – all deficient of the required 23 feet	TBD	
Parking stall located adjacent to a parking lot entrance (public or private) (Sec. 5.3.13)	- shall not be located closer than twenty-five (25) feet from the street right-of-way (ROW) line, street easement or sidewalk, whichever is closer	Parking spot located in the northwestern corner of the site appears to be closer than 25 feet from the street easement	TBD	Please either revise the plan so that this space is shifted to the east or request a deviation
End Islands (Sec. 5.3.12)	- End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles. - The end islands shall generally be at least 8 feet wide, have an outside radius of 15 feet, and be constructed 3' shorter than the adjacent parking stall as illustrated in the Zoning Ordinance	End islands are 3' shorter than adjacent parking stall and appear to comply with the other requirements	Yes	See Landscape Review and Traffic Review for additional comments
Barrier Free Spaces <i>Barrier Free Code</i>	For 51 to 75 spaces, 3 BF spaces are required	3 BF shown, 1 van accessible	Yes	
Barrier Free Space Dimensions <i>Barrier Free Code</i>	- 8' wide with an 8' wide access aisle for van accessible spaces - 8' wide with a 5' wide access aisle for regular accessible spaces	Shown	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Barrier Free Signs <i>Barrier Free Code</i>	One sign for each accessible parking space.	Signs shown, details and dimensions provided on attachment	Yes	See Traffic Review for additional comments
Minimum number of Bicycle Parking <i>(Sec. 5.16.1)</i>	4 spaces required	3 bike hoops proposed, details of hoop provided, but not foundation and layout (distance between hoops)	TBD	Please include bicycle parking details in the next submittal See Sec. 5.16 for bicycle parking requirements
Bicycle Parking General requirements <i>(Sec. 5.16)</i>	No farther than 120 ft. from the entrance being served	Yes	Yes	
	When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations	One entrance served		
	Spaces to be paved and the bike rack shall be inverted "U" design Shall be accessible via 6 ft. paved sidewalk	Connected to sidewalk		
Bicycle Parking Lot layout <i>(Sec 5.16.6)</i>	Parking space width: 7 ft. One tier width: 11 ft. Two tier width: 18 ft. Maneuvering lane width: 4 ft. Parking space depth: 32 in.	Please provide details in the next submittal	TBD	See comments above
Loading Spaces Sec. 5.4.1	Within the RC districts, loading, unloading space shall be: - provided in the rear yard at a ratio of ten (10) square feet for each front foot of building - in the case of a double frontage lot, in the interior side yard, beyond the minimum side yard setback requirement of the district.	Loading space: 10.5 ft. x 50 ft. (500 sq ft)	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Dumpster <i>Sec 4.19.2.F</i>	- Located in rear yard - Attached to the building or - No closer than 10 ft. from building if not attached - Not located in parking setback - If no setback, then it cannot be any closer than 10 ft., from property line. - Away from Barrier free spaces	Dumpster shown and enclosure is attached to the building Located in exterior side yard Details provided	Yes	Location in the exterior side yard will require a deviation (3.6.2.C) <i>Acknowledged by applicant</i>
Dumpster Enclosure <i>Sec. 21-145. (c)</i> <i>Chapter 21 of City Code of Ordinances</i>	- Screened from public view - A wall or fence 1 ft. higher than height of refuse bin - And no less than 5 ft. on three sides - Posts or bumpers to protect the screening - Hard surface pad. - Screening Materials: Masonry, wood or evergreen shrubbery	Screening indicated	Yes	
Accessory Structures <i>Sec. 4.19</i>			Yes	
Exterior lighting <i>Sec. 5.7</i>	Photometric plan and exterior lighting details needed at time of Final Site Plan submittal.	Photometric Plan included	Yes	
Roof top equipment and wall mounted utility equipment <i>Sec. 4.19.2.E.ii</i>	- All roof top equipment must be screened and all wall mounted utility equipment must be enclosed and integrated into the design and color of the building.	None proposed	Yes	
Roof top appurtenances screening	Roof top appurtenances shall be screened in accordance with applicable facade regulations, and shall not be visible from any street, road, or adjacent property.			
Non-Motorized Facilities				
Article XI. Off-Road Non-Motorized Facilities	A 6 foot sidewalk is required along collector and arterial roads Building exits must be	8' sidewalk proposed along Novi Road Exits are connected to sidewalks	Yes	See Engineering Review

Item	Required Code	Proposed	Meets Code	Comments
	connected to sidewalk system or parking lot.			
Pedestrian Connectivity	Assure safety and convenience of both vehicular and pedestrian traffic both within the site and in relation to access streets	Appears to comply	TBD	See Traffic Review for additional comments
Other Requirements				
Design and Construction Standards Manual	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Appears to comply	Yes	New Sidwell number will need to be used once parcel combination and street vacation are complete
General layout and dimension of proposed physical improvements	Location of all existing and proposed buildings, proposed building heights, building layouts, (floor area in square feet), location of proposed parking and parking layout, streets and drives, and indicate square footage of pavement area (indicate public or private).	Appears to comply	Yes	
Economic Impact	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	Not included	No	<u>Please include the total cost and number of anticipated jobs with the Final Site Plan submittal</u>
Development/ Business Sign & Street addressing	- Signage if proposed requires a permit. - The applicant should contact the Building Division for an address prior to applying for a building permit.	Proposed signage not reviewed at this time	TBD	<u>For further information contact Ordinance 248-347-0438 if a sign permit is required.</u>
Project and Street naming	Some projects may need approval from the Street and Project Naming Committee.		TBD	

Item	Required Code	Proposed	Meets Code	Comments
Property Split	The proposed property split must be submitted to the Assessing Department for approval.	No split proposed	NA	<u>Parcels 22-15-200-097 and 22-15-200-098 will need to be combined prior to final approval</u> Acknowledged by applicant
Lighting and Photometric Plan (Sec. 5.7)				
Intent (Sec. 5.7.1)	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties, & reduce unnecessary transmission of light into the night sky.		Yes	
	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures.		Yes	
Security Lighting (Sec. 5.7.3.H) Lighting for security purposes shall be directed only onto the area to be secured.	- All fixtures shall be located, shielded, and aimed at the areas to be secured. - Fixtures mounted on the building and designed to illuminate the facade are preferred.	Provided	Yes	
Building Lighting (Sec. 5.7.2.A.iii)	Relevant building elevation drawings showing all fixtures, the portions of the walls to be illuminated, illuminance levels of walls and the aiming points of any remote fixtures.	Lighting shown on building elevations	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Lighting Standards (Sec.5.7.A.2)	Specifications for all proposed & existing lighting fixtures.	Included	Yes	
	Photometric data	Included	Yes	
	Fixture height	Included	Yes	
	Mounting & design	Included	Yes	
	Glare control devices	Included	Yes	
	Type & color rendition of lamps	Included	Yes	
	Hours of operation	Included	Yes	
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties.	Included	Yes	
Maximum Height (Sec. 5.7.3.A)	Height not to exceed maximum height of zoning district (or 25 ft. where adjacent to residential districts or uses.	Max is 25 feet Not adjacent to residential	Yes	
Standard Notes (Sec. 5.7.3.B)	- Electrical service to light fixtures shall be placed underground - Flashing light shall not be permitted - Only necessary lighting for security purposes & limited operations shall be permitted after a site's hours of operation	Included	Yes	
Average Light level ratio (Sec. 5.7.3.E)	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1.	3.6:1 in exterior areas and 3.9:1 in parking lot	Yes	
Color Spectrum Management (Sec. 5.7.3.F)	For all permanent lighting installations – minimum Color Rendering Index of 70 and Correlated Color Temperature of no greater than 3000 Kelvin	All products show compliance with minimum CRI and maximum CCT	Yes	
Min. Illumination (Sec. 5.7.3.k)	Parking areas: 0.2 min	All in compliance	Yes	
	Loading & unloading areas: 0.4 min		Yes	
	Walkways: 0.2 min		Yes	

Item	Required Code	Proposed	Meets Code	Comments
	Building entrances, frequent use: 1.0 min		Yes	
	Building entrances, infrequent use: 0.2 min		Yes	
Max. Illumination adjacent to Non-Residential (Sec. 5.7.3.K)	When site abuts a non-residential district: - Maximum illumination at the property line shall not exceed 1 foot candle.	Appears to comply	Yes	
Cut off Angles (Sec. 5.7.3.L)	When adjacent to residential districts: - All cut off angles of fixtures must be 90°. - Maximum illumination at the property line shall not exceed 0.5 foot candle.	Not adjacent to residential	NA	
NOTES: 1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards. 2. The section of the applicable ordinance or standard is indicated in parenthesis. Please refer to those sections in Article 3, 4 and 5 of the zoning ordinance for further details 3. Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.				

ENGINEERING REVIEW



PLAN REVIEW CENTER REPORT

6/5/2024

Engineering Review

Culver's
JSP23-0037

APPLICANT

Charles Paisley, UPH Novi Property LLC

REVIEW TYPE

2nd Revised Preliminary Site Plan

PROPERTY CHARACTERISTICS

- Site Location: North side of W Oaks Drive west of Novi Road
- Site Size: 1.69 acres
- Plan Date: 5/15/2024
- Design Engineer: Nowak & Fraus Engineers

PROJECT SUMMARY

- Construction of an approximately 4106 square-foot restaurant and associated parking. Site access would be provided via West Oaks Drive.
- Water service would be provided by 8-inch extension from the existing 8-inch water main along the west side of the property. Two 2-inch domestic leads are proposed, along with one additional hydrant.
- Sanitary sewer service would be provided by 8-inch extension from the existing sanitary sewer off-site on the neighboring property. A monitoring manhole is proposed on-site along with a 6-inch lead to the building.
- Storm water would be collected into the proposed storm sewer system and a pre-treatment structure is proposed prior to storm water leaving the site. Stormwater will be detained in the West Oaks regional detention basin.

RECOMMENDATION

Approval of the 2nd Revised Preliminary Site Plan is recommended, with items to be addressed at Final Site Plan submittal.

Comments:

The 2nd Revised Preliminary Site Plan meets the general requirements of the design and construction standards as set forth in [Chapter 11 of the City of Novi Code of Ordinances](#),

the Storm Water Management Ordinance and the [Engineering Design Manual](#) with the following items to be addressed at the time of Final Site Plan submittal:

General

1. North Karevich ROW vacation will be needed. The draft maintenance/access easement has been submitted. The access agreement should also include the cross access for the Value City customers. This can all be included into the one agreement.
2. Provide at least two reference benchmarks at intervals no greater than 1,200 feet. At least one referenced benchmark must be a City-established benchmark, refer to [City of Novi Survey Benchmarks Arch Map](#). Benchmark 1522 is located at the crossing of West Oaks Drive and S Karevich Drive.
3. Provide a note on the plans that all work shall conform to the current City of Novi standards and specifications.
4. **Only at the time of the printed Stamping Set submittal**, provide the City's standard detail sheets for water main (5 sheets), sanitary sewer (3 sheets), storm sewer (2 sheets), and paving (2 sheets). The most updated details can be found on the City's website under [Engineering Standards and Construction Details](#).
5. A [Right-of-Way Permit](#) will be required from the City of Novi for proposed sidewalk.
6. Provide sight distance measurements for the West Oaks Drive entrance in accordance with Figure VIII-E of the [Design and Construction Standards, Chapter 11 of the City of Novi Code of Ordinances](#).
7. Provide a traffic control sign table listing the quantities of each **permanent** sign type proposed for the development. Provide a note along with the table stating all traffic signage will comply with the current MMUTCD standards.
8. Provide a note that compacted sand backfill (MDOT sand Class II) shall be provided for all utilities within the influence of paved areas; illustrate and label on the profiles.
9. Provide a construction materials table on the utility plan listing the quantity and material type for each utility (water, sanitary and storm) being proposed.
10. Provide a utility crossing table indicating that at least 18-inch vertical clearance will be provided, or that additional bedding measures will be utilized at points of conflict where adequate clearance cannot be maintained.
11. Provide a note stating if dewatering is anticipated or encountered during construction, then a dewatering plan must be submitted to the Engineering Division for review.
12. The grading and SESC sheets shall show the tree fence at least as far from the trunk as the critical root zone, defined as a circular area around a tree with a radius measured to the tree's longest dripline radius plus one (1) foot. No grading shall occur within the dripline. If the critical root zone is not fully protected, then replacements for that tree may be required.

Water Main

13. All water main easements shall be 20-feet wide. Revise the proposed easement accordingly.
14. Place the hydrants at least 7 feet off back of curb (allowing 3-foot clearance from sidewalk).
15. A tapping sleeve, valve and well is required at the connection to the existing water main.
16. Per current EGLE requirement, provide a profile for all proposed water main 8-inch and larger. An 8-inch main is required for the proposed hydrant, additionally a 20-foot easement should be shown around the main and the hydrant.
17. 6-inch hydrant leads are allowed for leads less than or equal to 25 feet in length. 8-inch leads are required for leads greater than 25 feet in length.
18. All gate valves 6" or larger shall be placed in a well with the exception of a hydrant shut off valve. A valve shall be placed in a box for water main smaller than 6".
19. Indicate why 2 water service leads are shown on the plans, label fire suppression.
20. A sealed set of utility plans along with the [Michigan Department of Environment, Great Lakes & Energy \(EGLE\) permit application](#) for water main construction, the [Streamlined Water Main Permit Checklist](#), [Contaminated Site Evaluation Checklist](#), and an electronic version of the utility plan should be submitted to the Engineering Division for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets, and the standard detail sheets.

Irrigation Comments

21. Irrigation plans are not approved, see attached letter dated 6/7/2024.

Sanitary Sewer

22. Provide a sanitary sewer monitoring manhole, unique to this site, within a dedicated access easement or within the road right-of-way. Label Monitoring Manhole.
23. Provide a sanitary sewer basis of design for the development on the utility plan sheet. (Calculations should use peaking factor of 4.0 and 3.2 People/REU).
24. Provide a note on the Utility Plan and sanitary profile stating the sanitary leads will be buried at least 5 feet deep where under the influence of pavement.
25. *For 8-inch and larger extensions* - Provide a testing bulkhead immediately upstream of the sanitary connection point. Additionally, provide a temporary 1-foot-deep sump in the first sanitary structure proposed upstream of the connection point, and provide a secondary watertight bulkhead in the downstream side of this structure.
26. Provide an internal drop connection if inlet pipe enters the manhole at an invert elevation 18 inches or greater above the invert elevation of the outlet pipe. Internal drop connections require a minimum 5-foot diameter structure.
27. Illustrate all pipes intersecting with manholes on the sanitary profiles.

28. Three (3) sealed sets of revised utility plans along with the [Michigan Department of Environment, Great Lakes & Energy \(EGLE\) permit application](#), electronic utility plan for sanitary sewer construction, and the Streamlined Sanitary Sewer Permit Certification Checklist should be submitted to the Engineering Division for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets, and the standard detail sheets. It should be indicated with the application if an expedited EGLE review is requested. EGLE will charge a fee that can be paid directly to the State.

Storm Sewer

29. Provide a 0.1-foot drop in the downstream invert of all storm structures where a change in direction of 30 degrees or greater occurs.
30. Match the 0.80 diameter depth above invert for pipe size increases.
31. Storm manholes with differences in invert elevations exceeding two feet shall contain a 2-foot-deep plunge pool.
32. Provide a four-foot-deep sump and an oil/gas separator in the last storm structure prior to discharge off-site/to the storm water basin.
33. Label all inlet storm structures on the profiles. Inlets are only permitted in paved areas and when followed by a catch basin within 50-feet.
34. Label the 10-year HGL on the storm sewer profiles and ensure the HGL remains at least 1-foot below the rim of each structure.
35. Illustrate all pipes intersecting storm structures on the storm profiles. Existing water main and sanitary lead not shown on profiles.
36. Provide a schedule listing the casting type, rim elevation, diameter, and invert sizes/elevations for each proposed, adjusted, or modified storm structure on the utility plan. Round castings shall be provided on all catch basins except curb inlet structures.
37. Show and label all roof conductors and show where they tie into the storm sewer.
38. Provide the storm sewer design table for this site.

Storm Water Management Plan

39. The Storm Water Management Plan (SWMP) for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the [Engineering Design Manual \(updated Jan 31, 2024\)](#)
40. This site will ultimately discharge in to the West Oaks Regional Detention Basin, provide total amount of pervious vs impervious area. This is needed to calculate the Stormwater Detention Fees.
41. As part of the Storm Drainage Facility Maintenance Easement Agreement, provide an access easement for maintenance over the storm water detention system and the pretreatment structure. Also, include an access easement to the detention area from the public road right-of-way.
42. Provide manufacturer's details and sizing calculations for the pretreatment structure(s) on the plans. Provide drainage area and runoff coefficient

calculations specific to the area tributary to each treatment structure. The treated flow rate should be based on the 1-year storm event intensity (~1.6 In/Hr). Higher flows shall be bypassed.

43. Provide supporting calculations for the runoff coefficient determination. A runoff coefficient of 0.35 shall be used for all turf grass lawns (mowed lawns) and 0.95 shall be used for all impervious surfaces. Provide overall C factor for site.

Paving & Grading

44. Provide a construction materials table on the Paving Plan listing the quantity and material type for each pavement cross-section being proposed.
45. Provide grades for the proposed sidewalk along North Karevich Drive.
46. Provide a minimum of 6 spot elevations where the pathway crosses each driveway (one at each corner and two in the center of the driveway on each side of the pathway). Spot elevations shall be provided to demonstrate a level landing adjacent to each side of the pathway crossing.
47. No more than 1/4" vertical obstacle shall be allowed at each transition between the pathway and the drive approach.
48. Indicate why heavy-duty pavement is proposed, city standard asphalt and concrete detail can support truck load. If a non standard cross-section is being proposed show cross section on plans.
49. Provide dumpster pad cross-section or refer to city standard.
50. Provide spot elevations at the intersection of the proposed pathway with the existing pathway.
51. Detectable warning plates are required at all barrier free ramps, hazardous vehicular crossings and other areas where the sidewalk is flush with the adjacent drive or parking pavement. The barrier-free ramps shall comply with current MDOT specifications for ADA Sidewalk Ramps. Provide the latest version of the MDOT standard detail for detectable surfaces.
52. Label specific ramp locations on the plans where the detectable warning surface is to be installed.
53. Specify the product proposed and provide a detail for the detectable warning surface for barrier free ramps. The product shall be the concrete-embedded detectable warning plates, or equal, and shall be approved by the Engineering Division. Stamped concrete will not be acceptable.
54. Verify the slopes along the ingress/egress routing to the building from the barrier-free stalls. All barrier-free stalls shall comply with Michigan Barrier-Free regulations.
55. Provide existing and proposed contours on the Grading Plan at the time of the Final Site Plan submittal.
56. Provide a note on the Grading Plan stating that the proposed pathway within the road right-of-way shall match existing grades at both ends.
57. Provide at least 3-foot of buffer distance between the sidewalk and any fixed objects, including hydrants and irrigation backflow devices. Include a note on the plan where the 3-foot separation cannot be provided.

58. **Show proposed grades for all adjusted sanitary, water, and storm structures.**
59. Site grading shall be limited to 1V:4H (25-percent), excluding landscaping berms. Numerous areas appear to exceed this standard.
60. Provide spot grades along property lines adjacent to perimeter curb at 100-foot intervals to demonstrate site drainage is self-contained.
61. Provide additional spot grades as necessary to demonstrate that a minimum 5-percent slope away from the building is provided for a minimum distance of ten feet around the perimeter of the building.
62. The City standard straight-faced curb (MDOT F-4 curb detail) shall be provided. Remove detail and attach City standard paving details.
63. Provide top of curb/walk and pavement/gutter grades to indicate height of curb adjacent to parking stalls or drive areas.
64. Dimensions of parking stalls abutting a curb or sidewalk are to the face of curb or walk. All other dimensions are to back of curb unless otherwise indicated.
65. Curbing and walks adjacent to the end of 17-foot stalls shall be reduced to 4-inches high. The grading sheet shows that the curb on the north side of the property is 6-inches adjacent to the 17-foot stalls. Show 2-foot overhang on paving sheets.

Soil Erosion and Sediment Control

66. A SESC permit is required. A full review has not been completed at this time. A review will be done when a completed packet is submitted to Sarah Marchioni at Community Development.

Off-Site Easements

67. Any off-site utility easements anticipated must be executed **prior to Stamping Set Approval**. If you have not already done so, drafts of the easements and a recent title search shall be submitted to the Community Development Department as soon as possible for review and shall be approved by the Engineering Division and the City Attorney prior to executing the easements.
68. Off-Site Sanitary Sewer Easement
69. North Karevich maintenance Agreement/ Access Agreement.

The following must be submitted with the Final Site Plan :

70. A letter from either the applicant or the applicant's engineer must be submitted with the Stamping Set highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved. **Additionally, a statement must be provided stating that all changes to the plan have been discussed in the applicant's response letter.**
71. An itemized construction cost estimate must be submitted to the Community Development Department for the determination of plan review and construction inspection fees. This estimate should only include the civil site work and not any costs associated with construction of the building or any demolition work. **The estimate must be itemized** for each utility (water, sanitary, storm

sewer), on-site paving (square yardage, should include number do detectable warning plates), right-of-way paving (including proposed right-of-way), grading, and the storm water basin (basin construction, control structure, pre-treatment structure and restoration).

72. Due to the above comments, the itemized construction cost estimate should be revised and resubmitted to the Community Development Department for the determination of plan review and construction inspection fees.

The following must be submitted with the Stamping Set:

*(Please note that all documents must be submitted together as a package with the Stamping Set submittal with the **legal review transmittal form that is attached to this review letter**. Partial submittals will **not** be accepted. Links to the PDF copy of the easements are below, word document versions of each legal document can be found on the City's Website under [Forms and Permits](#))*

73. A draft copy of the [Storm Drainage Facility Maintenance Easement Agreement \(SDFMEA\)](#), as outlined in the Storm Water Management Ordinance, must be submitted to the Community Development Department. Once the agreement is approved by the City's Legal Counsel, this agreement will then be sent to City Council for approval/acceptance. The SDFMEA will then be recorded at the office of the Oakland County Register of Deeds. This document is available on our website.
74. A draft copy of the 20-foot-wide [Watermain System Easement](#) onsite must be submitted to the Community Development Department.
75. A draft copy of the 20-foot-wide [Sanitary Sewer Easement](#) onsite must be submitted to the Community Development Department.
76. A draft sidewalk easement will be needed for the portion of the sidewalk along Novi Road that is on private property. 8-foot-wide pathways need a 12-foot wide easement.
77. Executed copies of approved off-site utility easements must be submitted.

The following must be addressed prior to construction:

78. A pre-construction meeting shall be required prior to any site work being started. Please contact Sarah Marchioni in the Community Development Department to setup a meeting (248-347-0430). **Be advised that scheduling the pre-construction meeting can take 2-4 weeks.**
79. A City of Novi Grading Permit will be required prior to any grading on the site. This permit will be issued at the pre-construction meeting (no application required). No fee is required for this permit.
80. Material certifications must be submitted to Spalding DeDecker for review prior to the construction of any onsite utilities. Contact Ted Meadows at 248-844-5400 for more information.

81. Construction inspection fees in the amount of **\$TBD** must be paid to the Community Development Department. ****fees are subject to change.**
82. Off-Site Legal exhibit review fees in the amount of **\$1,320.00** must be paid to the Community Development Department. **(ONLY FOR OFF-SITE DOCUMENTS)**
83. Legal escrow fees in the amount of **\$1,725.00** must be deposited with the Community Development Department. **All unused escrow will be returned to the payee at the end of the project** (except for escrows that are \$50 or less). This amount includes engineering legal fees only. There may be additional legal fees for planning legal documents. ****fees are subject to change.**
84. Legal fees for off-site easements should be paid as soon as possible so that documents can be approved.
85. A storm water performance guarantee in the amount of **\$TBD** (Equal to 120% of the cost required to complete the storm water management facilities) as specified in the Storm Water Management Ordinance must be posted at the Community Development Department.
86. Storm water detention tap fees in the amount of **\$TBD** for the proposed discharge to an off-site regional detention basin must be paid to the Community Development Department. ****fees are subject to change.**
87. Water and Sanitary Sewer Fees must be paid prior to the pre-construction meeting. Contact the Treasury Department at 248-347-0498 to determine the amount of these fees.
88. A street sign financial guarantee in the amount of **\$5,200.00** (\$400 per traffic control sign proposed) must be posted at the Community Development Department. Signs must be installed in accordance with MMUTCD standards.
89. A traffic control inspection fee of **\$605.00** must be paid to Community Development. This fee is the inspection of traffic control items such as signs, striping, curbs, parking stalls, sidewalk, detectable warning surfaces, and temporary pavement markings.
90. A [Soil Erosion Control Permit](#) must be obtained from the City of Novi. Contact Sarah Marchioni in the Community Development Department, Building Division (248-347-0430) for forms and information. The financial guarantee and inspection fees will be determined during the SESC review.
91. A permit for all proposed work activities within the road right-of-way must be obtained from the City of Novi. This application is available from the City Engineering Division or on the city website ([Right-of-Way Permit Application](#)) and can be filed once the Final Site Plan has been submitted. Please contact the Engineering Division at 248-347-0454 for further information. Please submit the cover sheet, standard details, and plan sheets applicable to the permit only.
92. An [Act 399 Permit for Community Water Supply Systems](#) for water main construction must be obtained from EGLE. This permit application must be

submitted through the Engineering Division after the water main plans have been approved. Please submit the cover sheet, overall utility sheet, standard details, and plan/profile sheets applicable to the permit.

93. A [Part 41 Permit For Wastewater Systems](#) for sanitary sewer construction must be obtained from EGLE. This permit application must be submitted through the Engineering Division after the sanitary sewer plans have been approved. Please submit the cover sheet, overall utility sheet, standard details and plan/profile sheets applicable to the permit. **Be aware that approval by both (1) Oakland County Water Resources Commissioner (OCWRC) and (2) Wayne County Department of Public Services (WCDPS) are required prior to submittal to EGLE.**
94. An inspection permit for the sanitary sewer tap must be obtained from the Oakland County Water Resources Commissioner (OCWRC).

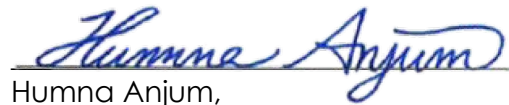
The following must be addressed prior to issuance of a Temporary Certificate of Occupancy (TCO) approval for the development:

95. The amount of the incomplete site work performance guarantee for any outstanding site improvement items (limited to top course of pavement and other minor items), is calculated at 1.2 times the amount required to complete the site improvements (as specified in the Performance Guarantee Ordinance).
96. All easements and agreements referenced above, must be executed, notarized and approved by the City Attorney and Engineering Division.
97. A [Bill of Sale for the Utilities](#) conveying the improvements to the City of Novi must be submitted to the Community Development Department.
98. The City's consultant Engineer Spalding DeDecker will prepare the record drawings for this development. The record drawings will be prepared in accordance with Article XII, Design and Construction Standards, Chapter 11 of the Novi Code of Ordinances.
99. Submit to the Community Development Department, Waivers of Lien from any parties involved with the installation of each utility as well as a Sworn Statement listing those parties and stating that all labor and material expenses incurred in connection with the subject construction improvements have been paid.
100. Submit a Maintenance Bond to the Community Development Department in the amount of **\$TBD** (Equal to 25 percent of the cost of the construction of the utilities to be accepted). This bond must be for a period of two years from the date that the Utility Acceptance Permit is issued by the City of Novi Engineering Division. This document is available on the City's website under [Forms and Permits](#).
101. Submit an up-to-date Title Policy (dated within 90 days of City Council consideration of acceptance) for the purpose of verifying that the parties signing the Easement and Bill of Sale documents have the legal authority to do so. Please be sure that all parties of interest shown on the title policy (including

mortgage holders) either sign the easement documents themselves or provide a Subordination Agreement. Please be aware that the title policy may indicate that additional documentation is necessary to complete the acceptance process.

To the extent this review letter addresses items and requirements that require the approval of or a permit from an agency or entity other than the City, this review shall not be considered an indication or statement that such approvals or permits will be issued.

Please contact Humna Anjum at (248)735-5632 or email at hanjum@cityofnovi.org with any questions.



Humna Anjum,
Project Engineer

cc: James Hill, Community Development
Ben Nelson, Engineering
Ben Croy, City Engineer

LANDSCAPE REVIEW



PLAN REVIEW CENTER REPORT

June 4, 2024
Culver's Restaurant
Second Revised Preliminary Site Plan - Landscaping

Review Type

Second Revised Preliminary Site Plan Landscape Review

Job #

JSP23-0037

Property Characteristics

- Site Location: NW corner of Novi Road and West Oaks Drive
- Site Acreage: 1.5 ac. (approx.)
- Site Zoning: R-C with PD2 option
- Adjacent Zoning: North, South, East, West: R-C
- Plan Date: 5/31/2024

Ordinance Considerations

This project was reviewed for conformance with Chapter 37: Woodland Protection, Zoning Article 5.5 Landscape Standards, the Landscape Design Manual and any other applicable provisions of the Zoning Ordinance. Items in **bold** below must be addressed and incorporated as part of the revised Preliminary Site Plan submittal. Underlined items must be addressed on the Final Site Plans. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review and the accompanying Landscape Chart are summaries and are not intended to substitute for any Ordinance.

RECOMMENDATION:

This project is **recommended for approval if the conditions requiring the three unsupported waivers are eliminated**. The remaining changes required can be addressed on Final Site Plans.

LANDSCAPE WAIVERS REQUIRED FOR PROPOSED LAYOUT

- No greenbelt berms are provided on either frontage – *supported by staff as a hedge is provided as screening.*
- Three greenbelt subcanopy trees not planted along 75lf of West Oaks frontage occupied by existing utility easements – *supported by staff*
- The space between the west access drive and the property line is not 10 feet – *supported by staff if the curb cut must be maintained in its existing position by Engineering and/or Traffic but would not be supported if the drive can be moved eastward 4 feet.*
- The proposed loading zone screening plantings will not provide the required screening – *not supported by staff.*
- The interior parking lot area and trees planted are deficient – *not supported by staff*
- Accessway perimeter tree not planted along the drive-thru lane within the watermain easement – *supported by staff.*
- The bay immediately north of the building is 15 spaces, plus the handicap access aisles and two-space wide access drive to the dumpster enclosure – *not supported by staff.*

Please add the City Project Number, JSP23-0037, to the bottom right corner of the Cover Sheet.

Ordinance Considerations

Existing Trees (Sec 37 Woodland Protection, Preliminary Site Plan checklist #17 and LDM 2.3 (2))

1. A complete tree survey is provided.
2. No wetlands exist on the site.
3. Two trees are shown as being preserved but one also appears to be impacted by grading. Please add tree protection fencing around the trees to be saved.
4. Please add a note stating that any off-site trees negatively impacted by its construction shall be replaced.

Adjacent to Residential - Buffer (Zoning Sec. 5.5.3.B.ii and iii)
The site is not adjacent to any residential property.

Adjacent to Public Rights-of-Way – Berm/Wall, Buffer and Street Trees (Zoning Sec. 5.5.3.B.ii, iii)

1. **A landscape waiver is required for the lack of berms along both West Oaks Drive and Novi Road.** *It would be supported by staff because hedges are provided to screen the drive-thru lanes from both roads.*
2. **A landscape waiver to not provide some of the subcanopy trees within the watermain easement along West Oaks Drive should be requested.** *It will be supported by staff.*

Parking Lot Landscaping (Zoning Sec. 5.5.3.C.)

1. Per the vehicular use area, the required landscape area and interior trees are not provided but it appears that they could be with correct labeling and identification. **Please correct the calculation as shown on the landscape chart, label interior islands and corners with interior trees with their SF, and add the required trees if necessary.**
2. **See the detailed discussion regarding parking lot perimeter trees and accessway perimeter tree placement.**
3. **A landscape waiver to not plant accessway perimeter trees within the watermain easement would be supported by staff.**
4. **A landscape waiver for the deficient perimeter depth between the west drive and west property line is required.** *It would be supported by staff if Engineering and/or Traffic require that the curb cut remain as it is.*
5. The bay just north of the building is in effect 17 spaces (the dumpster access way is 2 spaces), plus 2 accessible space aisles extend the bay even further. **This requires a landscape waiver.** *It would not be supported by staff. Please add a 200sf island on the east or west side of the dumpster access way.*

Building Foundation Landscaping (Zoning Section 5.5.3.D)

1. Calculations and hatched area showing proposed landscape areas are provided.
2. **Please add labels showing the SF of the different foundation landscaping areas.**

Plant List (LDM 4, 10)

1. 14 of 19 species used (74%) are native to Michigan.
2. The number of red maples used exceeds the 15% maximum. **Please reduce the number of red maples to meet the diversity requirement.**

Planting Notations and Details (LDM 10)

1. All required notes are provided.
2. Please add any additional planting details that may be required.

Storm Basin Landscape (Zoning Sec 5.5.3.E.iv and LDM 3)

1. No above-ground detention is proposed.
2. **If above-ground detention is required by Engineering, the basin must be landscaped per the current ordinance.**

Irrigation (LDM 10)

1. An irrigation system plan is provided.

2. It will be reviewed by our cross-connection specialist.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.735.5621 or rmeader@cityofnovi.org.

A handwritten signature in black ink, appearing to read "Rick Meader". The signature is fluid and cursive, with the first name "Rick" and last name "Meader" clearly distinguishable.

Rick Meader – Landscape Architect

LANDSCAPE REVIEW SUMMARY CHART – Second Revised Preliminary Site Plan

Review Date: June 4, 2024
Project Name: JSP23 – 0037: CULVER'S RESTAURANT
Plan Date: May 15, 2024
Prepared by: Rick Meader, Landscape Architect E-mail: rmeader@cityofnovi.org;
 Phone: (248) 735-5621

Items in **Bold** need to be addressed by the applicant before approval of the Preliminary Site Plan.
Underlined items need to be addressed for Final Site Plan.

LANDSCAPE WAIVERS REQUIRED FOR PROPOSED LAYOUT

- No greenbelt berms are provided on either frontage – *supported by staff as a hedge is provided as screening.*
- Three greenbelt subcanopy trees not planted along 75lf of West Oaks frontage occupied by existing utility easements – *supported by staff*
- The space between the west access drive and the property line is not 10 feet – *supported by staff if the curb cut must be maintained in its existing position by Engineering and/or Traffic, but would not be supported if the drive can be moved eastward 4 feet.*
- The proposed loading zone screening plantings will not provide the required screening – *not supported by staff.*
- The interior parking lot area and trees planted are deficient – *not supported by staff*
- Accessway perimeter tree not planted along the drive-thru lane within the watermain easement – *supported by staff.*
- The bay immediately north of the building is 15 spaces, plus the handicap access aisles and two-space wide access drive to the dumpster enclosure – *not supported by staff.*

Item	Required	Proposed	Meets Code	Comments
Landscape Plan Requirements (Landscape Design Manual (LDM) and Zoning Ordinance (Zoning Sec))				
Landscape Plan (Zoning Sec 5.5.2, LDM 2, 10)	• New commercial or residential developments • Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less. • 1" = 20' minimum with proper North. Variations from this scale can be approved by LA • Consistent with plans throughout set	Scale: 1" = 20'	Yes	
Project Information (LDM 10)	Name and Address	Yes	Yes	
Owner/Developer Contact Information (LDM 10)	Name, address and telephone number of the owner and developer or association	Only on cover sheet	No	Please add the information to the title block of the landscape plan and other sheets.
Landscape Architect contact information	Name, Address and telephone number of	John Ackerman, PLA – Kimley-Horn	Yes	

Item	Required	Proposed	Meets Code	Comments
(LDM 10)	RLA/PLA/LLA who created the plan	of Michigan		
Sealed by LA. (LDM 10)	Requires original signature	None		<u>Signature and seal of LA is required on the printed stamping sets.</u>
Miss Dig Note (800) 482-7171 (LDM 10)	Show on all plan sheets	Yes	Yes	
Zoning (LDM 10)	Include all adjacent zoning	• <u>Parcel:</u> R-C with PD-2 option • <u>North South, East, West:</u> R-C	Yes/No	<u>Please show the zoning of the parcels north and south of the site.</u>
Survey information (LDM 10)	• <u>Legal description or boundary line survey</u> • <u>Existing topography</u>	• Legal description on Sheet 1 • Topographical survey is on Sheet C-2.0	Yes	
Existing plant material Existing woodlands or wetlands (LDM 10)	• <u>Show location type and size. Label to be saved or removed.</u> • <u>Plan shall state if none exists.</u>	• Tree survey is shown on Sheet C2.0. • Removals are indicated on same sheet. • Tree chart is shown on Sheet L-1.0 • There are no wetlands or regulated woodlands on the site	• Yes • Yes • Yes • Yes	1. As there are no regulated trees being removed (not 36" dbh or greater and not in a regulated woodland), no replacements are required for any trees removed from the site. 2. Trees #1286 and #1287 are shown as being saved, but it appears that #1287 will be significantly impacted by the grading. Please revise the grading or show it as being removed. 3. Any of those offsite trees that are negatively impacted by the sewer line construction must be replaced with similar plant material. Please add a note to that effect to the relevant plan sheet and the landscape plan.
Soil types (LDM10)	• <u>As determined by Soils survey of Oakland</u>	• Sheet L-1.0 • Entire site is	Yes	

Item	Required	Proposed	Meets Code	Comments
	<u>county</u> • <u>Show types, boundaries</u>	Marlette sandy loam		
Existing and proposed improvements (LDM 10)	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	Yes	Yes	Please extend the “finger” between the west drive and the drive-thru lanes as much as possible to the north to increase the amount of greenspace on the site.
Existing and proposed utilities (LDM 10)	- Overhead and underground utilities, including hydrants - Show all existing and proposed lightposts on the site.	- All utility lines and structures are shown on the landscape plan. - Proposed lighting is shown	- Yes - Yes	Please show the utility easement boundary lines on the landscape plan so it is clear where trees shouldn't be planted.
Proposed grading. 2' contour minimum (LDM 10)	Provide proposed contours at 2' interval	- Sheets 4 and 4.1 - No berms are proposed	- Yes - No	A landscape waiver is requested for the lack of the required berms.
Snow deposit (LDM 10)	Show snow deposit areas on plan	Yes	Yes	
LANDSCAPING REQUIREMENTS				
Parking Area Landscape Requirements (Zoning Sec 5.5.3.C and LDM 5)				
General requirements (LDM 5)	- Clear sight distance within parking islands - No evergreen trees	Clear vision zones shown for all entries	Yes	<u>The clear zone is not required at the drive-thru lanes for this layout.</u>
Name, type and number of ground cover (LDM 5)	As proposed on planting islands	Groundcovers for all areas are indicated with different hatching patterns.	Yes	
General (Zoning Sec 5.5.3.C)				
Parking lot Islands	- A minimum of 200 SF to qualify - A minimum of 200sf unpaved area per tree planted in an island 6" curbs - Islands minimum width 10' BOC to BOC	All islands appear to be sufficiently large but their areas in SF are not provided	Yes/No	1. Please add SF area tags for all areas to be counted toward the parking lot interior requirement. 2. The island at the northeast corner of the building with the hydrant does not provide enough room for the tree there. Please move the sidewalk or enlarge the island to provide sufficient room and green space for that tree.

Item	Required	Proposed	Meets Code	Comments
Curbs and Parking stall reduction (Zoning Sec 5.3.12)	Parking stall can be reduced to 17' and the curb to 4" adjacent to a sidewalk of minimum 7 ft.	Spaces are shown as 17' long where they abut greenspace and 19 feet long when they abut a 5-foot sidewalk	Yes	
Contiguous space limit (Zoning sec 5.5.3.C)	Maximum of 15 contiguous spaces	15 spaces, plus the 2-space access way for the dumpster, is the maximum bay length	No	1. Please add a 200sf landscaped island in the long bay north of the building, east or west of the dumpster entry, to break up the long bay. 2. A landscape waiver would be required for the long bay. It would not be supported by staff.
Plantings around Fire Hydrant (Zoning sec 5.5.3.C)	- No plantings with matured height greater than 12' within 10 ft. of fire hydrants - Plant trees at least 5 ft from water and storm lines and 10 feet from sanitary lines. - Plantings near hydrants or FDCs should be no taller than 12"	- One hydrant is shown northeast of the building. - A Fire Department Connection is shown on the north side of the building with a note indicating that the plantings in front of it shall not be taller than 12".	- Yes - Yes	
Landscaped area (Zoning sec 5.5.3.C)	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	Yes	Yes	
Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, NCC, EXPO, FS, TC, TC-1, RC, Special Land Use or non-residential use in any R district (Zoning Sec 5.5.3.C)				
A = Total square footage of vehicular use areas up to 50,000sf x 7.5%	- A = x sf * 7.5 % = A sf 11911 * 7.5% = 893 sf	Calculations proposed	No	Please correct the calculation to remove the subtraction part. That is incorrect.
B = Total square footage of additional paved vehicular use areas (not including A or B) over 50,000 SF) x 1 %	- B = x sf * 1% = B sf (xxx – 50000) * 1% = xx sf	NA		
Category 2: For: I-1 and I-2 (Zoning Sec 5.5.3.C)				
A. = Total square footage of vehicular	A = x sf * 6% = A sf	NA		

Item	Required	Proposed	Meets Code	Comments
use area up to 50,000 sf x 5%				
B = Total square footage of additional paved vehicular use areas over 50,000 SF x 0.5%	$B = 0.5\% \times 0 \text{ sf} = B \text{ SF}$	NA		
All Categories				
C = A+B Total square footage of landscaped islands	- C = A + B - C = 893 + 0 = 893 SF	514 sf	No	A waiver is required for the deficiency. It would not be supported by staff. Please provide all of the required area.
D = C/200 Number of canopy trees required	- D = C/200 trees 893/200 = 4 Trees	3 trees	No	A waiver is required for the deficiency. It would not be supported by staff. Please provide all of the required trees.
Perimeter Green space (Zoning Sec 5.5.3.C)	1 Canopy tree per 35 lf - North side: 192/35 = 5 trees - South side: 65/35 = 2 trees	- North side: 8 trees - South side: 1 tree	- Yes - No	Please move one of the northern perimeter trees so there are two perimeter trees west of the dumpster.
Accessway perimeter (Zoning Sec 5.5.3.C)	1 canopy tree per 35 lf on each side of road, less widths of access drives. West accessway: (228+150)/35 = 11 trees Drive-thru accessway including east edge of northeastern accessway: - Inner edge: (128 + 36+35+95)/35 = 6 trees - Outer edge: 530/35 = 15 trees Northeastern accessway 95/35 = 2 trees	Exterior accessway - Only 6 feet is provided between the drive and the property line. 11 trees are provided along the drive Drive-thru accessway - Inner edge: 6 trees - Outer edge: 18 trees (3 shared with western outer drive) Northeastern accessway - West side of northeastern accessway drive: 1 tree	- No - Yes - Yes - Yes - No	Please shift the drive over 4 feet to provide the required 10 feet of space. A waiver for the space deficiency is required for the proposed layout. It would only be supported if Engineering and/or Traffic determine that the entry cannot be shifted. Please spread the trees along the western access drive out so they reach the start of the clear vision zone, are fairly equally spaced and don't crowd the tree on the adjoining property. Please move the red oak near the north entrance east to

Item	Required	Proposed	Meets Code	Comments
				within 10 feet of the accessway curb. 4. If possible, please extend the greenspace in the interior drive-thru island in place of at least some of the striped pavement west of the island to increase the site's green space. 5. A waiver to not provide 1 tree along the outer edge of the interior drive within the watermain easement would be supported by staff.
Berms (Zoning Sec 5.5.3.A & LDM 1)				
- All berms shall have a maximum slope of 33%. Gradual slopes are encouraged. Show 1ft. contours - Berm should be located on lot line except in conflict with utilities. - Berms should be constructed with 6" of topsoil.				
Residential Adjacent to Non-residential (Sec 5.5.3.A & LDM 1.a)				
Berm requirements (Zoning Sec 5.5.A)	The site is not adjacent to residential property so this screening berm is not required.	None	Yes	
Adjacent to Public Rights-of-Way (Sec 5.5.3.B and LDM 1.b)				
Berm requirements (Zoning Sec 5.5.3.A.(5))	An undulating berm a minimum 2 feet high with a 3-foot-wide crest is required	No berm is proposed	No	A landscape waiver is required for the lack of a berm. As a screening hedge is proposed for most of the frontages, it would be supported by staff.
Cross-Section of Berms (LDM 10)				
Slope, height and width	- Label contour lines - Maximum 33% - Min. 3 feet flat horizontal area - Minimum 3 feet high - Constructed of loam with 6' top layer of topsoil.	No berms are proposed.		
Type of Ground Cover		NA		
Walls (Zoning Sec 5.5.3.A & LDM 10)				
Material, height and	Freestanding walls	No walls are	TBD	

Item	Required	Proposed	Meets Code	Comments
type of construction footing	should have brick or stone exterior with masonry or concrete interior	indicated		
Walls greater than 4 ft. should be designed and sealed by an Engineer		NA		
ROW Landscape Screening Requirements (Zoning Sec 5.5.3.B.ii)				
Greenbelt width	Adj to Parking: 20 ft.	• Novi Road: 20 ft • West Oaks Dr: 20 ft	• Yes • Yes	
Min. berm crest width	Adj to Parking: 2 ft.	None	No	As noted above, a landscape waiver is required for the lack of a berm. As a screening hedge is proposed for most of the frontage, it would be supported by staff
Minimum berm height	Adj to Parking: 3 ft.	None	No	See above
3' wall	(2)(3)(4)	No		
Canopy deciduous or large evergreen trees	• Adj to Parking: 1 tree per 35 lf • Novi Road: $217/35 = 6$ trees • West Oaks Dr: $286/35 = 8$ trees	• Novi Road: 7 trees (double-counted accessway perimeter trees) • West Oaks Dr: 8 trees (8 double-counted accessway perimeter trees).	• Yes • Yes	
Sub-canopy deciduous trees)	• Adj to Parking: 1 tree per 20 lf • Novi Road: $217/20 = 11$ trees • West Oaks Dr: $286/20 = 14$ trees	• Novi Road: 11 trees • West Oaks Dr: 11 trees	• Yes • No	A waiver to not plant trees within the 75 feet of West Oaks frontage occupied by the water main easement would be supported by staff.
Canopy deciduous trees in area between sidewalk and curb	• Parking & No Parking: 1 tree per 45 lf • Novi Road: $(217-120)/45 = 3$ trees (120lf is shown as in the RCOC "no plant" zone) • West Oaks Dr: $(307-70)/45 = 5$ trees	• Novi Road: 5 subcanopy trees near overhead wires • West Oaks Dr: 6 trees	• Yes • Yes	As the Road Commission does not allow plantings between the sidewalk and road along Novi Road, those trees do not need to be provided at all, but correspondence from RCOC showing that should be provided to the City.
Non-Residential Projects (Zoning Sec 5.5.3.F.iii)				

Item	Required	Proposed	Meets Code	Comments
Screening of outdoor storage, loading/unloading (Zoning Sec. 3.14, 3.15, 4.55, 4.56, 5.5)	The loading zone must be screened from roads	The proposed loading zone is partially blocked by greenbelt plantings from view of West Oaks Drive.	TBD	- The proposed shrubs will not attain a height sufficient to screen trucks in the loading zone from West Oaks and Novi Road. Please switch those plantings to taller, fuller species that will provide the required screening. As they are, a landscape waiver would be required. It would not be supported by staff.
Transformers/Utility boxes (LDM 6)	- A minimum of 2ft. separation between box and the plants - Ground cover below 4" is allowed up to pad. - No plant materials within 8 ft. from the doors	No transformer is shown	TBD	<u>When transformer locations are finalized, screening shrubs per standard detail are required.</u> <u>Please add the City utility box screening detail to plans.</u> <u>City of Landscape Note #13 should read 4 sides should be screened, not 3.</u>
Building Foundation Landscape Requirements (Zoning Sec 5.5.3.D)				
Interior site landscaping SF (Zoning Sec 5.5.3.D)	- Equal to the entire perimeter of the building x 8. - A: (283-16.42)lf x 8ft = 2,133 SF - Planting beds should have a minimum width of 4 ft.	2192 sf – not noted	TBD	- Shaded areas indicate that sufficient area is provided but the areas' SF is not provided. - Please label all foundation landscape areas with their SF so the calculation can be verified.
<i>Building Frontage Landscaping (Zoning Sec 5.5.3.D)</i>	If visible from public street a minimum of 60% of the exterior building perimeter should be covered in green space	- Novi Road: 100% - West Oaks Dr.: 100%	- Yes - Yes	The greenbelt hedge may be included in the West Oaks Drive frontage calculation since it blocks the view of the building from West Oaks Drive.
Detention/Retention Basin Requirements (Zoning Sec. 5.5.3.E & LDM 3)				
Planting requirements	• Clusters of large native	No above-ground	TBD	If above-ground

Item	Required	Proposed	Meets Code	Comments
(Zoning Sec 5.5.3.E & LDM 3)	shrubs shall cover 70-75% of the basin rim area at 10 lf from permanent water level • 10" to 14" tall grass along sides of basin • Refer to wetland for basin mix • Deciduous canopy tree 1/35 of east, south and west sides of pond at 10 feet from permanent water level	detention is shown		detention is provided, it must be landscaped per the current ordinance.
Phragmites and Japanese Knotweed Control (Zoning Sec 5.5.6.B)	• Any and all populations of Phragmites australis and/or Japanese Knotweed on site shall be included on tree survey. • Treat populations per MDEQ guidelines and requirements to eradicate the weed from the site.	A note indicates there is none of either weed on the site	Yes	
LANDSCAPING NOTES, DETAILS AND GENERAL REQUIREMENTS				
Landscape Notes – Utilize City of Novi Standard Notes				
Installation date (LDM 10)	Provide intended date	Between Mar 15 and Nov 15	Yes	
Maintenance & Statement of intent (Zoning Sec 5.5.6 & LDM 10)	• Include statement of intent to install and guarantee all materials for 2 years. • Include a minimum one cultivation in June, July and August for the 2-year warranty period.	Both notes are provided	Yes	
Plant source (LDM 10 & 11)	Shall be northern nursery grown, No.1 grade.	Northern nursery	Yes	
Irrigation plan (LDM 10)	• A fully automatic irrigation system or a method of providing sufficient water for plant establishment and survival is required on Final Site Plans. • If irrigation won't be used, note how trees will get sufficient water for establishment and	Provided	TBD	The irrigation plan will be reviewed by our cross-connection specialist.

Item	Required	Proposed	Meets Code	Comments
	long-term survival			
Establishment period (Zoning Sec 5.5.6 & LDM 10)	2 yr. Guarantee	Yes	Yes	If the developer does only requires a 1-year guarantee from their contractor, then Landscape Note #7 can remain as is, but the developer is responsible for a 2-year guarantee.
Approval of substitutions. (Zoning Sec 5.5.5 & LDM 10)	City must approve any substitutions in writing prior to installation.	Yes	Yes	
Plant List (LDM 10 & 11) – Include all cost estimates				
Quantities and sizes	- At least 50% of species used shall be native to Michigan - Tree diversity shall follow guidelines of LDM Section 4	Yes	Yes	
Root type		Yes	Yes	
Botanical and common names (LDM 4 & 11)		14 of 19 species (74%) are native to Michigan. - Too many red maples are used (21%).	- Yes - No	- Please reduce the number of red maples used to no more than 12 (15%). - This can be done by adding a species or using more of the species with less than 12 trees on the site.
Type and amount of lawn		- Different groundcovers are indicated with hatching - Areas (in SF) of seed and sod are not indicated.	Yes	
Cost estimate (LDM 10)	For all new plantings, mulch and sod as listed on the plan	No		- Please add to final site plan. - Areas and costs of seed, sod and mulch should be included in the cost estimate. - Use these standard costs: - Canopy tree: \$400 ea - Lg evergreen: \$375 ea - Ornamental: \$375 ea - Shrub: \$50 ea - Perennial/ornamental grass: \$15 ea

Item	Required	Proposed	Meets Code	Comments
				- Grass seed: \$3/syd - Sod: \$6/syd - Mulch: \$35/cyd
Planting Details/Info (LDM Part III) – Utilize City of Novi Standard Details				
Canopy Deciduous Tree	Refer to LDM for detail drawings	Yes	Yes	
Evergreen Tree		No	No	<u>Please add if any evergreen trees will be used.</u>
Multi-stem Tree		No	TBD	<u>Please add if any multi-stem trees will be used.</u>
Shrub		Yes	Yes	
Perennial/ Ground Cover		Yes	Yes	
Tree stakes and guys. (Wood stakes, fabric guys)		Yes	Yes	
Tree protection fencing	Located at Critical Root Zone (1' outside of dripline)	2 on-site trees are shown as being saved but no tree fencing around them is shown. - Tree protection detail is on L-1.0	- No - Yes	<u>Please show protective tree fence on the Demolition and/or Soil Erosion Control plan to protect any saved trees or trees on adjacent properties within 50 feet of disturbance, including off-site trees near the sanitary sewer extension.</u>
Other Plant Material Requirements (LDM 11)				
General Conditions	Plant materials shall not be planted within 4 ft. of property line	The trees west of the west drive are within 4 feet	No	Please move the drive eastward to provide the required spacing.
Landscape tree credit (LDM 11)	- Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA. - Refer to Landscape tree Credit Chart in LDM	None proposed		
Plant Sizes for ROW, Woodland replacement and others (LDM 11)	- Size determined by use detailed in LDM Table 11.b.(2)a.i - Indicate on plant list	On plant list	Yes	
Plant size credit (LDM 11)	NA	No		
Prohibited Plants (LDM 11.b)	No plants on City Invasive Species List	No prohibited plants are	Yes	

Item	Required	Proposed	Meets Code	Comments
		proposed		
Recommended trees for planting under overhead utilities (LDM 11)	Label the distance from the overhead utilities	- Overhead lines are shown along Novi Road - Subcanopy trees are proposed as street trees there.	Yes	The subcanopy street trees are not required if the RCOC does not allow street trees between the sidewalk and road.
Nonliving Durable Material: Mulch (LDM 12)	- Trees shall be mulched to 3" depth and shrubs, groundcovers to 2" depth - Specify natural color, finely shredded hardwood bark mulch. Include in cost estimate.	On details	Yes	

NOTES:

1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.
2. The section of the applicable ordinance or standard is indicated in parenthesis. For the landscape requirements, please see the Zoning Ordinance landscape section 5.5 and the Landscape Design Manual for the appropriate items under the applicable zoning classification.
3. Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.

TRAFFIC REVIEW



AECOM
39575 Lewis Dr, Ste. 400
Novi
MI, 48377
USA
aecom.com

Project name:
JSP23-37 – Culver's 2nd Revised Preliminary
Traffic Review

To:
Barbara McBeth, AICP
City of Novi
45175 10 Mile Road
Novi, Michigan 48375

From:
AECOM

Date:
June 4, 2024

CC:
Lindsay Bell, Humna Anjum, Diana Shanahan,
James Hill, Adam Yako, Heather Zeigler, Dan
Commer

Memo

Subject: JSP23-37 – Culver's 2nd Revised Preliminary Traffic Review

The 2nd revised preliminary site plan was reviewed to the level of detail provided and AECOM recommends **approval** as long as the comments and deviations provided below are adequately addressed to the satisfaction of the City.

GENERAL COMMENTS

1. The applicant, Union Pacific Holdings, LLC, is proposing a 4,106 SF Culver's restaurant.
2. The development is located on the south side of Karevich Drive, north of West Oaks Drive and west of Novi Road. Karevick Drive and West Oaks Drive are under the jurisdiction of the City of Novi. Novi Road is under the jurisdiction of the Road Commission for Oakland County.
3. The site is zoned RC (Regional Center) with PD-2 option.
4. There following traffic related deviations may be required if plans are not revised:
 - a. Below standard radius at one driveway.
 - b. Potential below standard bicycle parking layout.
 - c. Potential below minimum clear path width to bicycle parking.
5. The applicant has indicated the following deviations will be requested:
 - a. Dumpster location.

TRAFFIC IMPACTS

1. AECOM performed an initial trip generation based on the ITE Trip Generation Manual, 11th Edition, as follows.

ITE Code: 934 – Fast-Food Restaurant with Drive-Through Window
Development-specific Quantity: 4,106 GLA
Zoning Change: None

Trip Generation Summary	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
AM Peak-Hour Trips	183	93	100	No
PM Peak-Hour Trips	135	70	100	No
Daily (One-Directional) Trips	1,917	N/A	750	Yes

2. The City of Novi generally requires a traffic impact study/statement if the number of trips generated by the proposed development exceeds the City's threshold of more than 750 trips per day or 100 trips per either the AM or PM peak hour, or if the project meets other specified criteria.

Trip Impact Study Recommendation	
Type of Study:	Justification
Traffic Impact Study	A revised traffic study was submitted and approved with no pending comments. Revised TIS: An evaluation of the parking related to the proposed development was completed following the city zoning ordinance. This calculates to 48 spaces. The development is proposing 48 parking spaces, which meets the City's zoning ordinance.

TRAFFIC REVIEW

The following table identifies the aspects of the plan that were reviewed. Items marked O are listed in the City's Code of Ordinances. Items marked with ZO are listed in the City's Zoning Ordinance. Items marked with ADA are listed in the Americans with Disabilities Act. Items marked with MMUTCD are listed in the Michigan Manual on Uniform Traffic Control Devices.

The values in the 'Compliance' column read as 'met' for plan provision meeting the standard it refers to, 'not met' stands for provision not meeting the standard and 'inconclusive' indicates applicant to provide data or information for review and 'NA' stands for not applicable for subject Project. The 'remarks' column covers any comments reviewer has and/or 'requested/required variance' and 'potential variance'. A potential variance indicates a variance that will be required if modifications are not made or further information provided to show compliance with the standards and ordinances. The applicant should put effort into complying with the standards; the variances should be the last resort after all avenues for complying have been exhausted. Indication of a potential variance does not imply support unless explicitly stated.

EXTERNAL SITE ACCESS AND OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
1	Driveway Radii O Figure IX.3	6', 30' and matching existing	Partially Met	6' does not meet 15' minimum requirement. A mountable concrete median drive approach has been added. The applicant has not indicated if they will be requesting a deviation. Provide truck turning movements for anticipated delivery trucks that need to get to the loading zone.
2	Driveway Width O Figure IX.3	28.5' and 36'	Met	Within range.
3	Driveway Taper O Figure IX.11			
3a	Taper length	-	N/A	
3b	Tangent	-	N/A	
4	Emergency Access O 11-194.a.19	2 access points	Met	

EXTERNAL SITE ACCESS AND OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
5	Driveway sight distance O Figure VIII-E	Not indicated	N/A	For major through roads.
6	Driveway spacing			
6a	Same-side O 11.216.d.1.d	-	N/A	
6b	Opposite side O 11.216.d.1.e	-	N/A	
7	External coordination (Road agency)	-	N/A	No changes proposed to Novi Road.
8	External Sidewalk Master Plan & EDM	Proposed 8' walk along Novi Road and 5' connection to site	Met	
9	Sidewalk Ramps EDM 7.4 & R-28-K	Indicated	Partially Met	Include standard detail R-28-K in future submittal.
10	Any Other Comments:			

INTERNAL SITE OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
11	Loading zone ZO 5.4	500 SF required, 1,010 proposed	Met	
12	Trash receptacle ZO 5.4.4	Proposed directly next to the building on the west side	Not Met	The applicant is requesting a deviation for location of dumpster.
13	Emergency Vehicle Access	Turning movements provided	Met	
14	Maneuvering Lane ZO 5.3.2	20' and 30'	Met	
15	End islands ZO 5.3.12			
15a	Adjacent to a travel way	Dimensioned	Met	3' shorter than adjacent space.
15b	Internal to parking bays	Provided	Met	Internal islands not required to be 3' shorter than adjacent parking.
16	Parking spaces ZO 5.2.12	56 including 3 accessible spaces		See Planning review letter. The site data table lists 53 spaces but the site plan total shows 56 spaces.
17	Adjacent parking spaces ZO 5.5.3.C.ii.i	<15 spaces in all parking bays	Met	
18	Parking space length ZO 5.3.2	17' and 19' perpendicular spaces, 18' angled spaces, 21' minimum parallel spaces	Met	

INTERNAL SITE OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
19	Parking space Width ZO 5.3.2	8' parallel spaces and 9'	Met	
20	Parking space front curb height ZO 5.3.2	Not Indicated	Inconclusive	Provide in future submittal, 6" standard in front of 19' parking spaces, 4" standard with 2' overhang in front of 17' spaces. Provide detail of bumper blocks in future submittal.
21	Accessible parking – number ADA	3	Met	
22	Accessible parking – size ADA	8' with 5' or 8' aisle	Met	
23	Number of Van-accessible space ADA	1	Met	
24	Bicycle parking			
24a	Requirement ZO 5.16.1	4 required, 4 proposed	Met	
24b	Location ZO 5.16.1	Provided	Met	
24c	Clear path from Street ZO 5.16.1	6' required	Inconclusive	Dimension the width of the sidewalk from the crosswalk to the bicycle parking to ensure the 6' requirement is met.
24d	Height of rack ZO 5.16.5.B	3' required	Inconclusive	Provide in future submittal.
24e	Other (Covered / Layout) ZO 5.16.1	Not dimensioned	Not Met	Refer to Text Amendment 18.301 for updated layout requirements.
25	Sidewalk – min 5' wide Master Plan	5'	Met	
26	Sidewalk ramps EDM 7.4 & R-28-K	Not indicated at accessible spaces.	Inconclusive	Label on plan and provide detail in future submittal.
27	Sidewalk – distance back of curb EDM 7.4	-	N/A	
28	Cul-De-Sac O Figure VIII-F	-	N/A	
29	EyeBrow O Figure VIII-G	-	N/A	
30	Stacking Spaces ZO 5.3.11.I	Partially dimensioned	Partially Met	Dimension length of stacking space in future submittal.
31	Any Other Comments:	Minimum 25' drive-through lane centerline radius provided. 48 parking spaces are required; the applicant could remove the 8 parallel parking spaces along the back of the site (or at least the 4 right in front of the drive-thru) since those spaces could interfere with drive-thru traffic.		

SIGNING AND STRIPING				
No.	Item	Proposed	Compliance	Remarks
32	Signing: Sizes MMUTCD	Not included	Not Met	Include in future submittal.
33	Signing table: quantities and sizes	Not included	Not Met	Include table in future submittal.

SIGNING AND STRIPING				
No.	Item	Proposed	Compliance	Remarks
34	Signs 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U-channel post MMUTCD	Not indicated	Not Met	Include in future submittal.
35	Signs greater than 12" x 18" shall be mounted on a galvanized 3 lb. or greater U-channel post MMUTCD	Not indicated	Not Met	Include in future submittal.
36	Sign bottom height of 7' from final grade MMUTCD	Not indicated	Not Met	Include in future submittal.
37	Signing shall be placed 2' from the face of the curb or edge of the nearest sidewalk to the near edge of the sign MMUTCD	Not included	Not Met	Include in future submittal.
38	FHWA Standard Alphabet series used for all sign language MMUTCD	Not included	Not Met	Include in future submittal.
39	High-Intensity Prismatic (HIP) sheeting to meet FHWA retro-reflectivity MMUTCD	Not included	Not Met	Include in future submittal.
40	Parking space striping notes	4" proposed	Partially Met	Indicate color of all proposed markings in future submittal.
41	The international symbol for accessibility pavement markings ADA	Not included	Not Met	Include detail in future submittal.
42	Crosswalk pavement marking detail	Not included	Not Met	Include in future submittal.
43	Any Other Comments:	Provide details for arrows, drive-thru, stop, and hatched pavement markings. The applicant should indicate the reason for the left turn-only sign after the drive-thru with the two-way street in front.		

Note: Hyperlinks to the standards and Ordinances are for reference purposes only, the applicant and City of Novi to ensure referring to the latest standards and Ordinances in its entirety.

Should the City or applicant have questions regarding this review, they should contact AECOM for further clarification.

Sincerely,

AECOM



Paula K. Johnson, PE
Senior Transportation Engineer



Saumil Shah, PMP
Project Manager



AECOM
27777 Franklin Road
Southfield
MI, 48034
USA
aecom.com

Project name:
JSP23-09 – Novi Ten TIS Traffic Review

From:
AECOM

Date:
September 20, 2024

To:
Barbara McBeth, AICP
City of Novi
45175 10 Mile Road
Novi, Michigan 48375

CC:
Lindsay Bell, Diana Shanahan, Dan Commer

Memo

Subject: JSP23-37 – Culver's of Novi Revised TIS Traffic Review – Comments resolution

The Traffic Impact Study was reviewed to the level of detail provided and AECOM recommends **approval** for the applicant to move forward.

Comments from Review on Feb 27, 2024 (review letter attached)

Comment: We do not agree with the TIS preparer's conclusion for the parking evaluation suggesting a peak parking demand of 38 spaces. The study has not considered the peak parking demand for Friday which is 51 spaces per ITE 5th Edition.

Response in the revised study: An evaluation of the parking related to the proposed development was completed. In accordance with the City zoning ordinance, the parking requirements for a restaurant are one space for every two employees, plus one space for every two customers allowed under maximum capacity (including waiting areas). This calculates to 48 spaces. The development is proposing 48 parking spaces, which meets the City's zoning ordinance.

Resolution: Comment resolved - Applicant is following the City's zoning ordinance.

CONCLUSIONS

The study concluded with excessive delay (LOS F) at Karevich Drive/Site driveway. However, the 95th percentile queues for the SB approach of the Oaks Drive South and Karevich Drive/Site Driveway intersection are 96 feet (four vehicles) and 63 feet (three vehicles) during the m.d. and p.m. peak hours, respectively.

Should the City or applicant have questions regarding this review, they should contact AECOM for further clarification.

Sincerely,

AECOM

Saumil Shah
Project Manager



AECOM
27777 Franklin Road
Southfield
MI, 48034
USA
aecom.com

Project name:
JSP23-09 – Novi Ten TIS Traffic Review

From:
AECOM

Date:
February 27, 2024

To:
Barbara McBeth, AICP
City of Novi
45175 10 Mile Road
Novi, Michigan 48375

CC:
Lindsay Bell, James Hill, Ian Hogg, Heather Zeigler,
Diana Shanahan

Memo

Subject: JSP23-37 – Culver's of Novi TIS Traffic Review

The Traffic Impact Study was reviewed to the level of detail provided and AECOM recommends **denial** of the Traffic Impact Study (parking evaluation); the applicant should review the comments provided below and provide a revised study to the City.

GENERAL COMMENTS

1. The memo will provide comments on a section-by-section basis following the format of the submitted report.
2. The project is located in the northwest corner of the intersection of Novi Road and West Oaks Drive/Twelve Oaks Mall Road in the City, Oakland County, Michigan.
3. The proposed development consists of a 4,106 sft Culver's fast-food restaurant with a drive-through window and realignment of Karevich Drive.

BACKGROUND DATA

1. The following roadways were included in the study:
 - a. Novi Road: North/South, 45 mph, 2/3 lanes divided.
 - b. The intersections and site driveways were included in the study.
 - Novi Road and Twelve Oaks Mall Road/Oaks Drive South (signalized).
 - Novi Road and Oaks Drive North (signalized).
 - Oaks Drive South and Karevich Drive/Proposed Site Driveway (unsignalized).
 - Oaks Drive North and Karevich Drive (unsignalized)
2. Applicant collected turning movements at the study intersections during the weekday m.d. (11 a.m. to 1 p.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the road network on Thursday, January 25, 2024

EXISTING CONDITIONS

1. The overall Level of Service (LOS) at the major road intersections is D or better.
2. The study reported SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For existing conditions, study network operations are acceptable, with no significant vehicle queues.

SITE TRIP GENERATION

1. A total of 1,919 daily trips are anticipated based on the ITE trip generation for 'Fast Food Restaurant with Drive Through Window' code 934.
2. A total of 55% of trips are considered pass-by trips during the afternoon peak hours (m.d. and p.m.). And a net increase of approx. 104 trips during the afternoon peak hour (m.d.) and approx. 61 trips during the evening peak hour (p.m.) are considered for a traffic impact study on the surrounding road network.

SITE TRAFFIC ASSIGNMENT

1. The largest portion of the traffic is assumed to be coming from/going to Novi Road followed by Twelve Oaks Mall Road and W Oaks Drive. The directions that site traffic will travel to and from were based upon existing traffic patterns during the m.d. and p.m. peak hours.

FUTURE CONDITIONS

1. Operations at the signalized intersections are not expected to deteriorate significantly at the study area intersections except at Oaks Drive South and Karevich Drive/Site Driveway (stop-controlled).
2. Excessive delay (LOS F) at Karevich Drive/Site driveway. However, the 95th percentile queues for the SB approach of the Oaks Drive South and Karevich Drive/Site Driveway intersection are 96 feet (four vehicles) and 63 feet (three vehicles) during the m.d. and p.m. peak hours, respectively.

Parking Evaluation

The report includes the parking requirements for a restaurant one space for every two employees, plus one space for every two customers allowed under maximum capacity (including waiting areas) following the City ordinance. This calculates to 48 spaces. The development is proposing 42 parking spaces, which is a deficit of 6 spaces per the City's zoning ordinance.

The report also anticipated parking demand calculated using the methodologies presented in the ITE Parking Generation Manual, 5th Edition resulting in a peak parking demand of 38 parking spaces.

We do not agree with the TIS preparer's conclusion for the parking evaluation suggesting a peak parking demand of 38 spaces. The study has not considered the peak parking demand for Friday which is 51 spaces per ITE 5th Edition.

CONCLUSIONS

1. The study concluded with excessive delay (LOS F) at Karevich Drive/Site driveway. However, the 95th percentile queues for the SB approach of the Oaks Drive South and Karevich Drive/Site Driveway intersection are 96 feet (four vehicles) and 63 feet (three vehicles) during the m.d. and p.m. peak hours, respectively.
2. The study has not considered the peak parking demand for Friday which is 51 spaces per ITE 5th Edition.

Should the City or applicant have questions regarding this review, they should contact AECOM for further clarification.

Sincerely,

AECOM



Saumil Shah, PMP
Project Manager



Jeff Wood, PE, PTOE
Senior Traffic Engineer

FAÇADE REVIEW



January 8, 2024

City of Novi Planning Department

45175 W. 10 Mile Rd.
Novi, MI 48375-3024

Status: Approved
Section 9 Waiver Recommended

Re: **FACADE ORDINANCE - Facade Review – Preliminary Site Plan**
Culver's, JSP23-37
Façade Region: 1, Zoning District: RC

Dear Ms. McBeth;

The following Facade Review is based on the drawings prepared by Henrickson Architects, dated 10/12/23. The percentages of materials proposed for each façade are as shown on the table below. The maximum percentages allowed by the Façade Ordinance are shown in the right-hand column. Materials in non-compliance with the Façade Chart, if any, are highlighted in bold.

	North (Front)	East	West	South	Ordinance Maximum (Minimum)
Brick	23%	30%	15%	47%	100% (30%)
Cultured Stone	26%	50%	50%	23%	50%
Composite Siding (Simulated Wood)	31%	6%	6%	18%	25%
EIFS	7%	11%	10%	4%	25%
Metal Awnings (Simiar to Standing Seam)	13%	3%	19%	8%	25%

As shown above the minimum percentage of Brick is not provided on the north and west elevations and the percentage of Composite Siding exceeds the maximum amount allowed by the Façade Ordinance on the north elevation. In this case the combined percentage of Brick and Stone meets the intent of the Ordinance with respect to the minimum amount of masonry and the comparatively small overage of Composite Siding enhances the design on the north elevation.

The aforementioned deviations are consistent with the intent and purpose of the Façade Ordinance. A Section 9 Waiver for the underage of Brick and overage of Composite Siding is therefore recommended.

The applicant has provided a sample board indicating that all facade materials including the “harbor blue” accents are consistent with Section 5.15.2 of the Ordinance. It should be noted that the blue LED accent lights proposed for the cornice must also comply with Section 5.15.2, which prohibits intense colors.

Notes to the Applicant:

1. Façade Ordinance requires façade inspection(s) for all projects. Materials and colors must be consistent with those displayed on the approved sample board or otherwise approved. It is the applicant’s responsibility to request the inspection of each façade material at the appropriate time, prior to installation. Inspections may be requested using the Novi Building Department’s Online Inspection Portal with the following link. Please click on “Click here to Request an Inspection” under “Contractors”, then click “Façade”. <http://www.cityofnovi.org/Services/CommDev/OnlineInspectionPortal.asp>.
2. All roof top equipment must be concealed from view from all vantage points both on-site and off-site using extended parapets or roof screens constructed of materials in compliance with the Façade Chart and harmonious with other façade materials.

If you have any questions regarding this review, please do not hesitate to call.

Sincerely,
DRN & Architects PC

A handwritten signature in black ink, appearing to read "Douglas R. Necci", written over the printed name.

Douglas R. Necci, AIA

FIRE REVIEW



June 3, 2024

CITY COUNCIL

Mayor

Justin Fischer

Mayor Pro Tem

Laura Marie Casey

Dave Staudt

Brian Smith

Ericka Thomas

Matt Heintz

Priya Gurumurthy

City Manager

Victor Cardenas

Director of Public Safety

Chief of Police

Erick W. Zinser

Fire Chief

John B. Martin

Assistant Chief of Police

Scott R. Baetens

Assistant Fire Chief

Todd Seog

Novi Public Safety Administration

45125 Ten Mile Road
Novi, Michigan 48375
248.348.7100
248.347.0590 fax

cityofnovi.org

TO: Barbara McBeth - City Planner
Lindsay Bell - Plan Review Center
James Hill – Plan Review Center
Heather Zeigler – Plan Review Center
Dan Commer – Plan Review Center
Diana Shanahan – Planning Assistant

RE: Culver's

PSP# 23-055

PreApp# 23-0018

PSP#23-055

JSP#23-37

Project Description:

Build a 4,060 Sq. Ft. structure off West Oaks Dr.

Comments:

- **All** fire hydrants **MUST** be installed and operational prior to any combustible material is brought on site. **IFC 2015 3312.1**
- For new buildings and existing buildings, you **MUST** comply with the International Fire Code Section 510 for Emergency Radio Coverage. This shall be completed by the time the final inspection of the fire alarm and fire suppression permits.
- **Completed 6-3-24 KSP-** The minimum width of a posted fire lane is 20 feet. The minimum height of a posted fire lane is 14 feet. **(D.C.S Sec. 158-99(a).)**
- **Completed 6-3-24 KSP-** Fire apparatus access drives to and from buildings through parking lots shall have a minimum fifty (50) feet outside turning radius and designed to support a minimum of thirty-five (35) tons. **(D.C.S. Sec 11-239(b)(5))**
- **RECEIVED 12/22/23** - A hazardous chemical survey is required to be submitted to the Planning & Community Development Department for distribution to the Fire Department at the time any Preliminary Site Plan is submitted for review and approval. Definitions of chemical types can be obtained from the Fire Department at (248) 735-5674.
- **COMPLETED 12/22/23** - Watermains and fire hydrant shall be put on the plans for review.
- Water mains greater than 25', shall be at least 8" in diameter. Shall be put on plans for review. **(D.S.C. Sec.11-68(C)(1)(c))**

Recommendation:

Approved with Conditions

Sincerely,

A handwritten signature in black ink, appearing to read 'KSP', with a long horizontal flourish extending to the right.

Kevin S. Pierce-Fire Marshal
City of Novi – Fire Dept.

cc: file

APPLICANT'S RESPONSE LETTER



June 20, 2024

James Hill, Planner
City of Novi
45175 Ten Mile Road
Novi, Michigan 48375

RE: **City of Novi Planning Review**
Culver's Novi
JSP 23-27

Dear James:

Please see attached/enclosed for our resubmittal to your office's review comments on behalf of the applicant, Culver's. The resubmittal includes the following documents:

2024-0222 - PLANNING REVIEW CHART: RC WITH PD-2 OPTION COMMENTS

Item	Required Code	Proposed	Meet Code	Comments	Response
Zoning and Use Requirements					
Master Plan (adopted July 27, 2017)	Regional Commercial	PD-2: Planned Development	Yes	PD-2 Option would require the Planning Commission's recommendation to City Council – concurrent with site plan/special land use	The applicant understands this requirement and will submit the required applications and documents to support this request
Area Study	None		NA		
Zoning (Effective January 8, 2015)	RC: Regional Commercial	RC with PD-2 Option	Yes		Comment acknowledged
Uses Permitted (Sec 3.1.24. B & C)	Sec 3.1.24.B Principal Uses Permitted. Sec 3.1.24.C Special Land Uses	Restaurant: Fast food drive-through	Yes	Subject to City Council approval upon Planning Commission's recommendation The public hearing from the previous Planning Commission meeting remained open so a notice is not required	The applicant understands this requirement and will submit the required applications and documents to support this request
Phasing	Provide phases lines and detail description of activities in each phase	Phasing not proposed	NA		No response required
Planned Development Site Plan Submittal Requirements (Sec. 3.31.4.A)					
Special Land Use (Sec. 3.31.4.A.ii)	Special Land use requirements listed in Sec. 6.1.2.C.		Yes		Comment acknowledged

Community Impact Statement (Sec. 3.31.4.A.iii)	Required according to site plan manual (SDM link: Site development Manual)	Included	Yes		Comment acknowledged
Traffic Study (Sec. 3.31.4.A.iii)	Required according to site plan manual (SDM link: Site development Manual)	Included	Yes		No response required
Planning Commission Findings for Site plan review (Sec. 3.31.4.A)	The proposed site plan meets the intent of other items listed in Section		TBD	PD Option and PSP can proceed simultaneously – Review conditions listed in this section	No response required
Use Conditions for Allowable uses under PD-2 Option (Sec. 3.31.7.B)					
Fast food drive-thru (Sec. 3.31.7.B.v.a)	When restaurants are independently freestanding uses and not attached to or otherwise clearly accessory to a principle use, they shall be located no closer than one-thousand (1,000) feet from any other such use on the same side of the street	Carabba's (south of site) appears to be closer than 1000 feet	No	Deviation will be required Deviation will be subject to the Planning Commission's recommendation, which will then go to City Council for approval	The applicant understands this requirement and will submit the required applications and documents to support this request
Minimum parcel size (Sec. 3.31.7.B.v.b)	1.25 acres.	1.4 acres as two separate parcels 1.69 acres proposed	Yes		No response required
Traffic Circulation (Sec. 3.31.7.B.v.c)	The site plan shall be designed to achieve traffic circulation features both within the site and in relation to access streets that assure safety and convenience of both vehicular and pedestrian traffic.	Traffic recommends approval	Yes	See Traffic Review for comments Deviation required for mountable concrete median drive approach Sheet C5.4 shows the fire truck path through parking spaces – please revise	See updated traffic study dated May 13, 2024 and responses to Traffic Review comments below
Restaurant in the Character of a Fast Food Carryout, Drive-In, Fast Food Drive-Through, or Fast Food Sit Down (Sec. 4.40.)					
Noise Impact Statement (Sec. 4.40.1)	A noise impact statement is required subject to the standards of Sec. 5.14.10.B.	Included	Yes		No response required
Drive-through Lanes (Sec. 5.3.11)					
Drive-through Lanes Separation (Sec. 5.3.11.A)	Drive-through lanes shall be separate from the circulation routes & lanes necessary for ingress to & egress from the property	Shown			No response required
Drive-through setbacks (Sec. 5.3.11.A,B)	Drive through shall follow parking setback requirements and applicable parking lot landscaping requirements	Complies			See responses to Traffic Review and Landscape Review below

Drive-through lanes parking access (Sec. 5.3.11.C)	Drive-through lanes shall not utilize any space which is necessary for adequate access to parking spaces from internal maneuvering lanes	20' one-way maneuvering lane along drive thru lane	Yes	See Traffic Review for further details	Maneuvering lanes have been updated to be a minimum of 20' wide. See dimensions on sheet C3.0.
Bypass Lane for Drive-through (Sec. 5.3.11.D)	Drive-through facilities shall provide 1 bypass lane, min. of 18 ft. in width, unless otherwise determined by the Fire Marshal	Bypass lane shown to be 20 feet wide	Yes		See responses to Fire Review and Traffic Review below
Width & Centerline Radius of Drive-through Lanes (Sec. 5.3.11.E,F,H)	Drive-through lanes shall have a minimum 9 ft. width, centerline radius of 25 ft. and a minimum length of 19 ft.	10 ft wide 25 ft centerline radius	yes	See Traffic Review for additional comments	Drive-through lanes centerline radii have been updated to be 25'. See sheet C3.0.
Drive-Thru Stacking Spaces (Sec. 5.3.11.I)	The distance between the order board and the pick-up window shall store four (4) vehicles, and four (4) vehicles shall be stored in advance of the menu board (not including the vehicles at the pick-up window and menu board).	Two menu boards shown Cars sketched in to show stacking	Yes	See Traffic Review for additional comments – although sketches are provided, please dimension the length of the stacking space	See responses to Traffic Review comments below Dimensions for the stacking spaces has been provided. See sheet C3.0.
Drive-through Lane Delineated (Sec. 5.3.11.G)	Drive-through lanes shall be striped, marked, or otherwise delineated	Appears to comply Drive-through lane delineated by concrete pavement	Yes		To be provided with Final Site Plan submittal
Height, bulk, density and area limitations (Sec 3.1.23.D)					
Frontage on a Public Street (Sec. 5.12) Access To Major Thoroughfare (Sec. 5.13)	Frontage on a Public Street is required.	Frontage on W Oaks Drive and Novi Road (due to street vacation)	Yes	If you vacate Karevich Dr. this site would be considered a double frontage lot (West Oaks Dr and Novi Road)	Comment acknowledged
Minimum Zoning Lot Size For each Unit in Acres (Sec 3.6.2.D)	Except where otherwise provided in this Ordinance, the minimum lot area and width, and the maximum percent of lot coverage shall be determined on the basis of off-street parking, loading greenbelt screening, yard setback, or usable open space.		NA		
Minimum Zoning Lot Size For each Unit: Width in Feet (Sec 3.6.2.D)			NA		
Open Space Area	-----	-----	NA		
Maximum % of Lot Area Covered	(Sec 3.6.2.D)	Building lot coverage: 5.6%	Yes		

(By All Buildings)					
Building Height (Sec. 3.20)	45ft. or 3 stories whichever is less	23 ft	Yes		
Outdoor Restaurants (Sec. 4.84)					
Accessory Use (Sec. 4.84)	Outdoor seating as an accessory use is allowed per section 4.84.	315 sq ft exterior seating area	Yes		
Site Plan Review (Sec. 4.84.1)	If the seating area is proposed as part of a site plan application it shall require site plan review and approval by the Planning Commission		TBD		Comment acknowledged
Building and fire codes (Sec. 4.84.1)	Outdoor seating areas shall also comply with all applicable building and fire codes		TBD		Comment acknowledged
Timings (Sec. 4.84.2)	Permitted between March 1 st and November 30 th	Details included	Yes		
Pathway (Sec. 4.84.4)	Outdoor seating areas shall be located in a manner to maintain a minimum pathway width of six (6) feet (clear of structures such as light poles, trees and hydrants) along the sidewalk	315 sq ft patio area	Yes		Sidewalk dimensions have been added. See sheet C3.0
Enclosure (Sec. 4.84.4)	It shall be enclosed where there is alcohol service		NA		
Location (Sec 4.84.5)	If located in public, ROW, then approval from all relate agencies is required. Additional requirements may apply.		NA		
Parking (Sec. 4.84.6)	For more than 20 seating, parking shall be calculated.	Approximately 15 seats appear to be shown	Yes		16 outdoor seats are shown on sheet C3.0 including one ADA-accessible outdoor seat
Hours of Operation (Sec. 4.84.7)	Hours of operation same as inside restaurant.	To be provided with FSP submittal	TBD		To be provided with Final Site Plan submittal
Building Setbacks (Sec. 3.31.7.D)					
Front @ W Oaks Drive (South)	50 ft	50.52 ft.	Yes		
Exterior Side Yard @ Novi Road (East)	50 ft	80.52 ft.	Yes		
Exterior Side Yard @ N Karevich Drive (North)	50 ft	114.88 ft.	Yes		
Exterior Side Yard @ N Karevich Dr (West)	50 ft	161.78 ft.	Yes		
Parking Setback (Sec. 3.31.7.D)					

Front @ W Oaks Drive (South)	20ft.	21 ft.	Yes		
Exterior side yard @ N Karevich Drive (West)	20ft.	Greater than 20 ft.	Yes		
Exterior side yard @ N Karevich Drive (North)	20ft.	20.8 ft.	Yes		
Exterior Side Yard @ Novi Road (East)	20ft.	20.9 ft.	Yes		
Note To District Standards for RC District (Sec. 3.6.2)					
Exterior Side Yard Abutting a Street (Sec 3.6.2.C)	All exterior side yards abutting a street shall be provided with a setback equal to front yard.	Shown	NA	See comments above	
Off-Street Parking in Front Yard (Sec 3.6.2.E)	Off-Street parking is allowed in front yard	Shown	Yes		
Distance Between Buildings (Sec 3.6.2.H)	It is governed by sec. 3.8.2 or by the minimum setback requirements, whichever is greater.	Only one proposed building	NA		
Wetland/Watercourse Setback (Sec 3.6.2.M)	A setback of 25ft from wetlands and from high watermark course shall be maintained.	No wetlands present	NA		
Additional Building Height (Sec 3.6.2.O)	Additional height up to 65ft may be allowed for properties within 1200ft from a freeway subject to additional conditions		NA		
Parking setback screening (Sec 3.6.2.P)	Required parking setback area shall be landscaped per sec 5.5.3.	Landscape plan provided	TBD	See Landscape Review	See responses to Landscape Review below
Modification of parking setback requirements (Sec 3.6.2.Q)	The Planning Commission may modify parking setback requirements based on its determination according to Sec 3.6.2.Q.	Does not apply	NA		Comment acknowledged
Parking, Loading and Dumpster Requirements					
Number of Parking Spaces Sec. 5.2.12.C	Fast Food Restaurants 1 for every 2 employees, plus 1 for every 2 customers allowed under maximum capacity (including waiting areas)	6 employees per shift: 3 spaces 90 seats: 45 spaces Total required: 3+ 45 = 48 Total provided: 53 (according to site data table) It appears that 56 spaces are provided	Yes	See Traffic Review for additional comments Since 8 spaces are provided in excess, the applicant could consider removing the parallel parking spaces in from of the pickup window on either side of the drive isle for better traffic flow	Site plan has been revised to 48 spaces total including 3 H/C parking spaces. The landscape review required removal of 2 spaces. 2 of the parallel spaces will be dedicated to order delivery and 2 spaces dedicated to parallel parking. See sheet C3.0.

Parking Space Dimensions and Maneuvering Lanes (Sec. 5.3.2)	<u>90° spaces</u> : 9 ft. x 19 ft. parking spaces with 24 ft. drives	9 ft x 19 ft proposed with 24 ft. drive	Yes	See Traffic Review for additional comments Also see comment above	2 parallel parking spaces are proposed, the parking spaces layouts have been revised to match the parallel parking requirements. See sheet C3.0. See responses to Traffic Review below
	<u>45° spaces</u> : 9 ft. x 18 ft. with 15 ft. drives	15 spaces, 9 ft. wide x 18 ft. with 20 ft. drive	Yes		
	9 ft. x 17 ft. parking spaces along 7 ft. interior sidewalks, provided a 4 in. curb at these locations & along landscaping	19 spaces, 9 ft. x 17ft, not along sidewalk	Yes		
	<u>0° Parallel parking spaces</u> : 8 ft x 23 ft with 13 ft drives and 6 ft buffers	Varied lengths for parallel parking spaces – all deficient of the required 23 feet	TBD		
Parking stall located adjacent to a parking lot entrance(public or private) (Sec. 5.3.13)	-shall not be located closer than twenty-five (25) feet from the street right-of-way(ROW) line, street easement or sidewalk, whichever is closer	Parking spot located in the northwestern corner of the site appears to be closer than 25 feet from the street easement	TBD	Please either revise the plan so that this space is shifted to the east or request a deviation	The site has been revised and shifted west so the parallel spaces are no longer in violation of the setback requirement. See sheet C3.0.
End Islands (Sec. 5.3.12)	-End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles. -The end islands shall generally be at least 8 feet wide, have an outside radius of 15 feet, and be constructed 3' shorter than the adjacent parking stall as illustrated in the Zoning Ordinance	End islands are 3' shorter than adjacent parking stall and appear to comply with the other requirements	Yes	See Landscape Review and Traffic Review for additional comments	Comment acknowledged
Barrier Free Spaces Barrier Free Code	For 51 to 75 spaces, 3 BF spaces are required	3 BF shown, 1 van accessible	Yes		
Barrier Free Space Dimensions Barrier Free Code	- 8' wide with an 8' wide access aisle for van accessible spaces - 8'wide with a 5' wide access aisle for regular accessible spaces	Shown	Yes		
Barrier Free Signs Barrier Free Code	One sign for each accessible parking space.	Signs Shown, details and dimensions provided on attachment	Yes	See Traffic Review for additional comments	
Minimum number of Bicycle Parking (Sec. 5.16.1)	4 spaces required	3 bike hoops proposed, details of hoop provided, but not foundation	TBD	Please include bicycle parking details in the next submittal	Bicycle parking details have been added for next

		and layout (distance between hoops)		See Sec. 5.16 for bicycle parking requirements	submittal. See detail sheet, C8.1
Bicycle Parking General requirements (Sec. 5.16)	No farther than 120 ft. from the entrance being served	Yes	Yes		Bicycle parking details to be provided in Final Site Plan submittal
	When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations	One entrance served			
	Spaces to be paved and the bike rack shall be inverted "U" design Shall be accessible via 6 ft. paved sidewalk	Connected to sidewalk			
Bicycle Parking Lot layout (Sec 5.16.6)	Parking space width: 7 ft. One tier width: 11 ft. Two tier width: 18 ft. Maneuvering lane width: 4 ft. Parking space depth: 32 in.	Please provide details in the next submittal	TBD	See Comments Above	Bicycle parking details to be provided in Final Site Plan submittal
Loading Spaces (Sec 5.16.6)	Within the RC districts, loading, unloading space shall be: -provided in the rear yard at a ratio of ten (10) square feet for each front foot of building -in the case of a double frontage lot, in the interior side yard, beyond the minimum side yard setback requirement of the district.	Loading space: 10.5 ft. x 50ft. (500 sq ft)	Yes		
Dumpster Sec 4.19.2.F	- Located in rear yard - Attached to the building or - No closer than 10 ft. from building if not attached - Not located in parking setback - If no setback, then it cannot be any closer than 10 ft., from property line. - Away from Barrier free spaces	Dumpster shown and enclosure is attached to the building Located in exterior side yard Details provided	Yes	Location in the exterior side yard will require a deviation (3.6.2.C) Acknowledged by applicant	Dumpster and enclosure is provided in exterior side yard away from barrier-free parking spaces Details to be provided with next submittal Comment about required deviation is acknowledged
Dumpster Enclosure Sec. 21-145. (c) Chapter 21 of City Code of Ordinances	- Screened from public view - A wall or fence 1 ft. higher than height of refuse bin - And no less than 5 ft. on three sides	Screening indicated	Yes		

	- Posts or bumpers to protect the screening - Hard surface pad. - Screening Materials: Masonry, wood or evergreen shrubbery				
Accessory Structures Sec. 4.19			Yes		
Exterior lighting Sec. 5.7	Photometric plan and exterior lighting details needed at time of Final Site Plan submittal.	Photometric Plan included	Yes		
Roof top equipment and wall mounted equipment Sec. 4.19.2.E.ii	-All roof top equipment must be screened and all wall mounted utility equipment must be enclosed and integrated into the design and color of the building.	None proposed	Yes		
Roof top appurtenances screening	Roof top appurtenances shall be screened in accordance with applicable façade regulations, and shall not be visible from any street, road, or adjacent property				
Non-Motorized Facilities					
Article XI. Off-Road Non-Motorized Facilities	A 6 foot sidewalk is required along collector and arterial roads Building exits must be connected to sidewalk system or parking lot.	8' sidewalk proposed along Novi Road Exits are connected to sidewalks	Yes	See Engineering Review	See responses to Engineering Review below.
Pedestrian Connectivity	Assure safety and convenience of both vehicular and pedestrian traffic both within the site and in relation to access streets	Appears to comply	TBD	See Traffic Review for additional comments	See responses to Traffic Review and Engineering Review below.
Other Requirements					
Design and Construction Standards Manual	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Appears to comply	Yes	New Sidwell number will need to be used once parcel combination and street vacation are complete	New sidwell number will be added to plans in future submittals once parcel combination is complete.
General layout and dimension of proposed physical improvements	Location of all existing and proposed buildings, proposed building heights, building layouts, (floor area in square feet), location of proposed	Appears to comply	Yes		

	parking and parking layout, streets, and drives, and indicate square footage of pavement area (indicate public or private).				
Economic Impact	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	Not Included	No	<u>Please include the total cost and number of anticipated jobs with the Final Site Plan submittal</u>	To be included as part of Final Site Plan submittal
Development/ Business Sign & Street addressing	- Signage if proposed requires a permit. - The applicant should contact the Building Division for an address prior to applying for a building permit.	Proposed signage not reviewed at this time	TBD	<u>For further information contact Ordinance 248-347-0438 if a sign permit is required.</u>	Comment acknowledged. Applicant and/ or engineer will contact Ordinance Department at the number listed if a sign is proposed
Project and Street naming	Some projects may need approval from the Street and Project Naming Committee.		TBD		Comment acknowledged
Property Split	The proposed property split must be submitted to the Assessing Department for approval.	No split proposed	NA	<u>Parcels 22-15-200-097 and 22-15-200-098 will need to be combined prior to final approval</u> Acknowledged by applicant	To be completed concurrent with Final Site Plan
Lighting and Photometric Plan (Sec. 5.7)					
Intent (Sec. 5.7.1)	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties, & reduce unnecessary transmission of light into the night sky.		Yes		
	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures.		Yes		
Security Lighting (Sec. 5.7.3.H) Lighting for security purposes shall be directed only onto the area to be secured.	- All fixtures shall be located, shielded, and aimed at the areas to be secured. - Fixtures mounted on the building and designed to illuminate the facade are preferred.	Provided	Yes		

Building Lighting (Sec. 5.7.2.A.iii)	Relevant building elevation drawings showing all fixtures, the portions of the walls to be illuminated, illuminance levels of walls and the aiming points of any remote fixtures.	Lighting shown on building elevations	Yes		
Lighting Standards (Sec.5.7.A.2)	Specifications for all proposed & existing lighting fixtures.	Included	Yes		
	Photometric data	Included	Yes		
	Fixture height	Included	Yes		
	Mounting & design	Included	Yes		
	Glare control devices	Included	Yes		
	Type & color rendition of lamps	Included	Yes		
	Hours of operation	Included	Yes		
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties.	Included	Yes		
Maximum Height (Sec 5.7.3.A)	Height not exceed maximum height of zoning district (or 25 ft), where adjacent to residential districts or uses.	Max is 25 feet	Yes		
		Not adjacent to residential			
Standard Notes (Sec. 5.7.3.B)	- Electrical service to light fixtures shall be placed underground - Flashing light shall not be permitted - Only necessary lighting for security purposes & limited operations shall be permitted after a site's hours of operation	Included	Yes		
Average Light level ratio (Sec. 5.7.3.E)	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1.	3.6:1 in exterior area and 3.9:1 in parking lot	Yes		
Color Spectrum Management (Sec. 5.7.3.F)	For all permanent lighting installations – minimum Color Rendering Index of 70 and Correlated Color Temperature of no greater than 3000 Kelvin	All products show compliance with minimum CRI and maximum CCT	Yes		
Min. Illumination (Sec. 5.7.3.k)	Parking areas: 0.2 min	All in compliance	Yes		
	Loading & unloading areas: 0.4 min		Yes		
	Walkways: 0.2 min		Yes		

	Building entrances, frequent use: 1.0 min		Yes		
	Building entrances, infrequent use: 0.2 min		Yes		
Max. Illumination adjacent to Non- Residential (Sec. 5.7.3.K)	When site abuts a non- residential district: - Maximum illumination at the property line shall not exceed 1 foot candle.	Appears to comply	Yes		
Cut off Angles (Sec. 5.7.3.L)	When adjacent to residential districts: -All cut off angles of fixtures must be 90° -Maximum illumination at the property line shall not exceed 0.5 foot candle	Not adjacent to residential	NA		

2024-0229 - ENGINEERING REVIEW (JSP23-0037) COMMENTS

General Comments

1. *North Karevich ROW vacation will be needed. The draft maintenance/access easement has been submitted. The access agreement should also include the cross access for the Value City customers. This can all be included into the one agreement.*
The draft maintenance/access easement agreement has been revised to include cross access for Value City customers.
2. *Provide at least two reference benchmarks at intervals no greater than 1,200 feet. At least one referenced benchmark must be a City-established benchmark, refer to City of Novi Survey Benchmarks Arch Map. Benchmark 1522 is located at the crossing of West Oaks Drive and S Karevich Drive.*
The benchmark 1522 will be added to the list of benchmarks in the future for incorporation into the plans.
3. *Provide a note on the plans that all work shall conform to the current City of Novi standards and specifications.*
The note has been added to the plan set, see sheet C3.0.
4. ***Only at the time of the printed Stamping Set submittal**, provide the City's standard detail sheets for water main (5 sheets), sanitary sewer (3 sheets), storm sewer (2 sheets), and paving (2 sheets). The most updated details can be found on the City's website under Engineering Standards and Construction Details.*
The standard detail sheets will be provided during the stamping set submittal process.
5. *A Right-of-Way Permit will be required from the City of Novi for proposed sidewalk.*
A right of way permit will be submitted for the proposed walk.
6. *Provide sight distance measurements for the West Oaks Drive entrance in accordance with Figure VIII-E of the Design and Construction Standards, Chapter 11 of the City of Novi Code of Ordinances.*
Site distance triangles have been added to the landscape plan, see sheet L.1.1
7. *Provide a traffic control sign table listing the quantities of each **permanent** sign type proposed for the development. Provide a note along with the table stating all traffic signage will comply with the*

current MMUTCD standards.

A sheet has been added for detailing the site signage and quantities as mentioned, see sheet C9.0

8. *Provide a note that compacted sand backfill (MDOT sand Class II) Shall be provided for all utilities within the influence of paved area; illustrate and label on the profiles.*
The note mentioned has been added to the utility plan, see sheet C5.0
9. *Provide construction materials table on the utility plan listing the quantity and material type for each utility (water, sanitary and storm) being proposed.*
The note mentioned has been added to the utility plan, see sheet C5.0
10. *Provide a utility crossing table indicating that at least 18-inch vertical clearance will be provided, or that additional bedding measures will be utilized at points of conflict where adequate clearance cannot be maintained.*
The crossing table mentioned has been added to the utility plan, see sheet C5.0
11. *Provide a note stating if dewatering is anticipated or encountered during construction, then a dewatering plan must be submitted to the Engineering Division for review.*
The note mentioned has been added to the utility plan, see sheet C5.0
12. *The grading and SESC sheets shall show the tree fence at least as far from the trunk as the critical root zone, defined as a circular area around a tree with a radius measured to the tree's longest dripline radius plus one (1) foot. No grading shall occur within the dripline. If the critical root zone is not fully protected, then replacements for that tree may be required.*
The grading and associated SESC measures have been revised as mentioned, see sheet C6.0

Water Main

13. *All water main easements shall be 20-feet wide. Revise the proposed easement accordingly.*
The proposed water main easements have been revised accordingly to 20' width. See sheet C5.0
14. *Place the hydrants at least 7 feet off back of curb (allowing 3-foot clearance from sidewalk).*
The proposed hydrant has been revised to 7' off the back of curb, see sheet C5.0
15. *A tapping sleeve, valve and well is required at the connection to the existing water main.*
The connections at the main have notes as mentioned, see sheet C5.0
16. *Per current EGLE requirement, provide a profile for all proposed water main 8-inch and larger. An 8-inch main is required for the proposed hydrant, additionally a 20-foot easement should be shown around the main and the hydrant.*
The proposed water main profiles have been added as mentioned, see the new sheet C5.5.
17. *6-inch hydrant leads are allowed for leads less than or equal to 25 feet in length. 8-inch leads are required for leads greater than 25 feet in length.*
The hydrant leads have been revised to 6 inch within 25' and a reducer for any longer length to 8 inch.
18. *All gate valves 6" or larger shall be places in a well with the exception of a hydrant shut off valve. A valve shall be placed in a box for water main smaller than 6".*
Comment acknowledged, see sheet C5.0, the valves are shown in wells as mentioned.

19. *Indicate why 2 water service leads are shown on the plans, label fire suppression.*
The plans have been revised to include a single service lead, see sheet C5.0. A label has been added to label fire suppression.
20. *A sealed set of utility plans along with the Michigan Department of Environment, Great Lakes & Energy (EGLE) permit application for water main construction, the Streamlined Water Main Permit Checklist, Contaminated Site Evaluation Checklist, and an electronic version of the utility plan should be submitted to the Engineering Division for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, and applicable utility sheets, and the standard detail sheets.*
The permit application as mentioned will be provided as mentioned for submittal to EGLE.

Irrigation Comments

21. *Irrigation plans are not approved see attached letter dated 6/7/2024*
The irrigation plans have been revised per the attached letter, see sheets 18 and 20.

Sanitary Sewer

22. *Provide a sanitary sewer monitoring manhole, unique to this site, within a dedicated access easement or within the road right-of-way. Label Monitoring Manhole.*
The monitoring manhole has been added to replace the cleanout, see sheet C5.0 and sheet C5.3
23. *Provide a sanitary sewer basis of design for the development on the utility plan sheet. (Calculations should use peaking factor of 4.0 and 3.2 People/REU)?*
The basis of design for the sanitary sewer has been added to sheet C5.3.
24. *Provide a note on the Utility Plan and sanitary profile stating the sanitary leads will be buried at least 5 feet deep where under the influence of pavement.*
The note has been added to the sanitary sewer sheet as mentioned, see sheet C5.3.
25. *For 8-inch and larger extensions – Provide a testing bulkhead immediately upstream of the sanitary connection point. Additionally, provide a temporary 1-foot-deep sump in the first sanitary structure proposed upstream of the connection point, and provide a secondary water tight bulkhead in the downstream side of this structure.*
A note has been added to the Sanitary Utility Plan sheet as mentioned, see sheet C5.3.
26. *Provide an internal drop connection if inlet pipe enters the manhole at an invert elevation 18 inches or greater above the invert elevation of the outlet pipe. Internal drop connections require a minimum 5-foot diameter structure.*
Internal drops have been added as required, see sheet C5.3.
27. *Illustrate all pipes intersecting with manholes on the sanitary profiles.*
All intersecting pipes have been added to the manholes on the sanitary profiles, see sheet C5.3.
28. *Three (3) sealed sets of revised utility plans along with the Michigan Department of Environment, Great Lakes & Energy (EGLE) permit application, electronic utility plan for sanitary sewer construction, and the Streamlined Sanitary Sewer Permit Certification Checklist should be submitted to the Engineering Division for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets, and the standard detail sheets. It should be indicated with the application if an expedited EGLE review is requested. EGLE will charge a fee that can be paid directly to the State.*

Storm Sewer

29. *Provide a 0.1-foot drop in the downstream, invert of all storm structures where a change in direction of 30 degrees or greater occurs.*
0.1 foot drop has been added as mentioned where necessary, see plan sheets C5.1 and C5.2.
30. *Match the 0.80 diameter depth above invert for pipe size increases.*
Pipes have been revised to match 0.8 inverts for pipe size increases as mentioned, see plan sheets C5.1 and C5.2.
31. *Storm manholes with differences in invert elevations exceeding two feet shall contain a 2-foot-deep plunge pool.*
Structures have been revised for sumps as mentioned, see plan sheets C5.1 and C5.2.
32. *Provide a four-foot-deep sump and an oil/gas separator in the last storm structure prior to discharge off-site/to the storm water basin.*
The last downstream structure layout has been revised as mentioned, see plan sheets C5.1 and C5.2.
33. *Label all inlet storm structures on the profiles. Inlets are only permitted on paved areas and when followed by a catch basin within 50-feet.*
The labels for the storm structures have add to the profile sheets, see plan sheets C5.1 and C5.2.
34. *Label the 10-year HGL on the storm sewer profiles and ensure the HGL remains at least 1-foot below the rim of each structure.*
The HGL and label have been added to the profile sheets, see plan sheets C5.1 and C5.2.
35. *Illustrate all pipes intersecting storm structures on the storm profiles. Existing water main and sanitary lead not shown on profiles.*
All intersecting pipes have been added the storm sewer profile sheets, see plan sheets C5.1 and C5.2.
36. *Provide a schedule listing the casting type, rim elevation, diameter, and invert sizes/elevations for each proposed, adjusted, or modified storm structure on the utility plan. Round castings shall be provided on all catch basins except curb inlet structures.*
A storm sewer structure schedules has been added All intersecting pipes have been added the storm sewer profile sheets, see plan sheets C5.1 and C5.2.
37. *Show and label all roof conductors and show where they tie into the storm sewer.*
All roof drains have been added to the plan and profile views and structure tables, see sheets C5.1 and C5.2
38. *Provide the storm sewer design table for this site.*
A storm sewer capacity design table has been added the storm sewer profile sheet, see plan sheet C5.2.

Storm Water Management Plan

39. *The Storm Water Management Plan (SWMP) for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the [Engineering Design Manual](#). The SWMP sheet has been added for supporting calcs and information, see plan sheet C6.1.*
40. *This site will ultimately discharge into the West Oaks Regional Detention Basin, provide total amount of pervious vs impervious area. This is needed to calculate the Stormwater Detention fees.*
The calculations as mentioned have been provided on the SWMP sheet has been added for supporting calcs and information, see plan sheet C6.1.
41. *As part of the Storm Drainage Facility Maintenance Easement Agreement, provide an access easement for maintenance over the pretreatment structure. Also, include an access easement to the detention area from the public road right-of-way.*
An access easement for maintenance of the pretreatment structure will be submitted to the City. There is no defined detention area for this site, therefore an access easement to the public road right of way may not apply in this instance.
42. *Provide manufacturer's details and sizing calculations for the pretreatment structure(s) on the plans. Provide drainage area and runoff coefficient calculations specific to the area tributary to each treatment structure. The treated floe rate should be based on the 1-year storm event intensity (~1.6 In/Hr). Higher flows shall be bypassed.*
Manufacturer details and sizing for the pretreatment structure have been added on a separate sheet from the Stormwater Management sheet. See plan sheet C6.2. Tributary area calcs for each structure can be found on sheet C6.0.
43. *Provide supporting calculations for the runoff coefficient determination. A runoff coefficient of 0.35 shall be used for all turf grass lawns (mowed lawns) and 0.95 shall be used for all impervious surfaces. Provide overall C factor for site.*
Runoff coefficient calcs can be seen on sheet C6.1.

Paving & Grading

44. *Provide a construction materials table on the Paving Plan listing the quantity and material type for each pavement cross-section being proposed.*
Tables as mentioned have been added to the site plan, see sheet C3.0.
45. *Provide grades for the proposed sidewalk along North Karevich Drive.*
Grades and elevations for the proposed sidewalk can be found on sheet C4.1.
46. *Provide a minimum of 6 spot elevations where the pathway crosses each driveway (one at each corner and two in the center of the driveway on each side of the pathway). Spot elevations shall be provided to demonstrate a level landing adjacent to each side of the pathway crossing.*
The grading plan has been revised to include the spot elevations as mentioned, see sheet C4.0.
47. *No more than ¼" vertical obstacle shall be allowed at each transition between the pathway and the drive approach.*
A note has been added to the grading plan, see sheet C4.0.
48. *Indicate the heavy-duty pavement is proposed, city standard asphalt and concrete detail can support truck load. If a non-standard cross-section is being proposed show cross section on plans.*
The pavement cross section and labels have been revised to a city standard cross section,

49. *Provide dumpster pad cross-section or refer to city standard.*
The plans have been revised to include the City standard for the dumpster pad.
50. *Provide spot elevations at the intersection of the proposed pathway with the existing pathway.*
The proposed pathway will match the existing elevations of the existing pathway. See “Match Existing” grades shown on sheet C4.1.
51. *Detectable warning plates are required at all barrier free ramps, hazardous vehicular crossings and other areas where the sidewalk is flush with the adjacent drive or parking pavement. The barrier-free ramps shall comply with current MDOT specifications for ADA Sidewalk Ramps. Provide the latest version of MDOT standard detail for detectable surfaces.*
Warning plates have been added as mentioned, see sheet C3.0.
52. *Label specific ramps locations on the plans where the detectable warning surface is to be installed.*
Warning plates have been added as mentioned, see sheet C3.0.
53. *Specify the product proposed and provide a detail for the detectable warning surface for barrier free ramps. The product shall be the concrete-embedded detectable warning plates, or equal, and shall be approved by the Engineering Division. Stamped concrete will not be acceptable.*
Warning plates and specs have been added as mentioned, see sheet C3.0.
54. *Verify slopes along the ingress/egress routing to the building from the barrier-free stalls. All barrier-free stalls shall comply with Michigan Barrier-Free regulations.*
See sheet C4.1 for more detail around the barrier-free stalls.
55. *Provide existing and proposed contours on the Grading Plan at the time of the Final Site Plan submittal.*
Comment acknowledged; this information will be provided in Final Site Plan submittal.
56. *Provide a note on the grading plan stating that the proposed pathway within the road right-of-way shall match existing grades at both ends.*
The note has been added as mentioned, see sheet C4.0.
57. *Provide at least 3-foot of buffer distance between the sidewalk and any fixed objects, including hydrants and irrigation backflow devices. Include a note on the plan where the 3-foot separation cannot be provided.*
The buffer has been verified and a note has been added to the plans, see sheet C4.0.
58. *Show proposed grades for all adjusted sanitary, water, and storm structures.*
Proposed rim elevations have been added for all structures, see sheet C4.0.
59. *Site grading shall be limited to 1V:4H (25-percent), excluding landscaping berms. Numerous area appear to exceed this standard.*
Site grading labels have been added to perimeter grading areas, see sheet C4.0.
60. *Provide spot grades along property lines adjacent to perimeter curb at 200-foot intervals to demonstrate site drainage is self-contained.*
Spot elevations have been added to perimeter grading areas, see sheet C4.0.
61. *Provide additional spot grades as necessary to demonstrate that a minimum 5-percent slope*

away from the building is provided for a minimum distance of ten feet around the perimeter of the building.

Spot elevations have been added to perimeter of the building, see sheet C4.0.

62. The City standard straight-faced curb (MDOT F-4 curb detail) shall be provided. Remove detail and attach City standard paving details.

see sheet C4.0.

63. Provide top of curb/walk and pavement/gutter grades to indicate height of curb adjacent to parking stall or drive areas.

Spot elevations have been added as mentioned, see sheet C4.0.

64. Dimensions of parking stall abutting a curb or sidewalk are to the face of curb or walk. All other dimensions are back of curb unless otherwise indicated.

Dimensions have been revised accordingly, see sheet C3.0.

65. Curbing and walks adjacent to the end of 17-foot stalls shall be reduced to 4-inches high. The grading sheet shows that the curb on the north side of the property is 6-inches adjacent to the 17-foot stalls. Show 2-foot overhang on the paving sheets.

The grading for curbs and walks has been revised as mentioned, see sheet C4.0.

Soil Erosion and Sediment Control

66. A SESC permit is required. A full review has not been completed at this time. A review will be done then a completed packet is submitted to Sarah Marchioni at Community Development.

A SESC permit will be submitted for review as mentioned.

Off-Site Easements

67. Any off-site utility easements anticipated must be executed **prior to Stamping Set Approval**. If you have not already done so, drafts of the easements and a recent title search shall be submitted to the Community Development Department as soon as possible for review and shall be approved by the Engineering Division and the City Attorney prior to executing the easements.

Drafts of the mentioned easements have been submitted to the City for review.

68. Off-site Sanitary Sewer Easement

A draft of the sanitary sewer easement have been submitted to the City for review.

69. North Karevich maintenance Agreement/ Access Agreement.

A draft of the maintenance/access agreement has been submitted to the City for review.

The following must be submitted with the Final Site Plan:

70. A letter from either the applicant or the applicant's engineer must be submitted with the Stamping Set highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved. **Additionally, a statement must be provided stating that all changes to the plan have been discussed in the applicant's response letter.**

Comment acknowledged; This information will be addressed in the final site plan submittal.

71. An itemized construction cost estimate must be submitted to the Community Development Department for the determination of plan review and construction inspection fees. This estimate should only include the civil sitework and not any costs associated with construction of the building or any demolition work. **The estimate must be itemized** for each utility (water, sanitary, storm sewer), on-site paving (square yardage, should include number do detectable warning

plates), right-of-way paving (including proposed right-of-way), grading, and the storm water basin (basin construction, control structure, pre-treatment structure and restoration).

Comment acknowledged; This information will be addressed in the final site plan submittal.

72. Due to the above comments, the itemized construction cost estimate should be revised and resubmitted to the Community Development Department for the determination of plan review and construction inspection fees.

Comment acknowledged; This information will be addressed in the final site plan submittal.

The following must be submitted with the Stamping Set:

(Please note that all documents must be submitted together as a package with the Stamping Set submittal with a legal review transmittal form. Partial submittals will not be accepted. Links to the PDF copy of the easements are below, word document versions of each legal document can be found on the City's Website under Forms and Permits)

73. A draft copy of the Storm Drainage Facility Maintenance Easement Agreement (SDFMEA), as outlined in the Storm Water Management Ordinance, must be submitted to the Community Development Department. Once the agreement is approved by the City's Legal Counsel, this agreement will then be sent to City Council for approval/acceptance. The SDFMEA will then be recorded at the office of the Oakland County Register of Deeds. This document is available on our website.

Comment acknowledged; This information will be addressed in the stamping set submittal.

74. A draft copy of the 20-foot-wide Watermain System Easement onsite must be submitted to the Community Development Department.

Comment acknowledged; This information will be addressed in the stamping set submittal.

75. A draft copy of the 20-foot-wide Sanitary Sewer Easement onsite must be submitted to the Community Development Department.

Comment acknowledged; This information will be addressed in the stamping set submittal.

76. A draft sidewalk easement will be needed for the portion of the sidewalk along Novi Road that is on private property. 8-foot-wide pathways need a 12-foot wide easement.

Comment acknowledged; This information will be addressed in the stamping set submittal.

77. Executed copies of approved off-site utility easements must be submitted.

Comment acknowledged; This information will be addressed in the stamping set submittal.

The following must be addressed prior to construction:

78. A pre-construction meeting shall be required prior to any site work being started. Please contact Sarah Marchioni in the Community Development Department to set up a meeting (248-347-0430). **Be advised that scheduling the pre-construction meeting can take 2-4 weeks.**

Comment acknowledged; This information will be addressed prior to construction.

79. A City of Novi Grading Permit will be required prior to any grading on the site. This permit will be issued at the pre-construction meeting (no application required). No fee is required for this permit.

Comment acknowledged; This information will be addressed prior to construction.

80. Material certifications must be submitted to Spalding DeDecker for review prior to the construction of any onsite utilities. Contact Ted Meadows at 248-844- 5400 for more information.

Comment acknowledged; This information will be addressed prior to construction.

81. *Construction inspection fees in the amount of \$TBD must be paid to the Community Development Department. ****fees are subject to change.***

Comment acknowledged.

82. *Off-Site Legal exhibit review fees in the amount of \$1,320.00 must be paid to the Community Development Department.*

Comment acknowledged.

83. *Legal escrow fees in the amount of **\$1,725.00** must be deposited with the Community Development Department. **All unused escrow will be returned to the payee at the end of the project** (except for escrows that are \$50 or less). This amount includes engineering legal fees only. There may be additional legal fees for planning legal documents. ****fees are subject to change.***

Comment acknowledged.

84. *Legal fees for off-site easements should be paid as soon as possible so that documents can be approved.*

Comment acknowledged.

85. *A storm water performance guarantee in the amount of **\$TBD** (Equal to 120% of the cost required to complete the storm water management facilities) as specified in the Storm Water Management Ordinance must be posted at the Community Development Department.*

Comment acknowledged.

86. *Storm water detention tap fees in the amount of **\$TBD** for the proposed discharge to an off-site regional detention basin must be paid to the Community Development Department. ****fees are subject to change.***

Comment acknowledged.

87. *Water and Sanitary Sewer Fees must be paid prior to the pre-construction meeting. Contact the Treasury Department at 248-347-0498 to determine the amount of these fees.*

Comment acknowledged.

88. *A street sign financial guarantee in the amount of **\$5,200.00** (\$400 per traffic control sign proposed) must be posted at the Community Development Department. Signs must be installed in accordance with MMUTCD standards.*

Comment acknowledged.

89. *A traffic control inspection fee of **\$605.00** must be paid to Community Development. This fee is the inspection of traffic control items such as signs, striping, curbs, parking stalls, sidewalk, detectable warning surfaces, and temporary pavement markings.*

Comment acknowledged.

90. *A Soil Erosion Control Permit must be obtained from the City of Novi. Contact Sarah Marchioni in the Community Development Department, Building Division (248-347-0430) for forms and information. The financial guarantee and inspection fees will be determined during the SESC review.*

Comment acknowledged.

91. *A permit for all proposed work activities within the road right-of-way must be obtained from the City of Novi. This application is available from the City Engineering Division or on the city website*

(Right-of-Way Permit Application) and can be filed once the Final Site Plan has been submitted. Please contact the Engineering Division at 248-347-0454 for further information. Please submit the cover sheet, standard details, and plan sheets applicable to the permit only.

Comment acknowledged.

92. [Act 399 Permit for Community Water Supply Systems](#) for water main construction must be obtained from EGLE. This permit application must be submitted through the Engineering Division after the water main plans have been approved. Please submit the cover sheet, overall utility sheet, standard details, and plan/profile sheets applicable to the permit.

Comment acknowledged.

93. A [Part 41 Permit For Wastewater Systems](#) for sanitary sewer construction must be obtained from EGLE. This permit application must be submitted through the Engineering Division after the sanitary sewer plans have been approved. Please submit the cover sheet, overall utility sheet, standard details, and plan/profile sheets applicable to the permit. **Be aware that approval by both (1) Oakland County Water Resources Commissioner (OCWRC) and (2) Wayne County Department of Public Services (WCDPS) are required prior to submittal to EGLE.**

Comment acknowledged.

94. An inspection permit for the sanitary sewer tap must be obtained from the Oakland County Water Resources Commissioner (OCWRC).

Comment acknowledged.

2024-0212 – PRELIMINARY SITE PLAN LANDSCAPING JSP23-0037) COMMENTS

Ordinance Considerations

Existing Trees (Sec 37 Woodland Protection, Preliminary Site Plan checklist #17 and LDM 2.3 (2))

1. A complete tree survey is provided.
Comment acknowledged; No response required.
2. No wetlands exist on the site.
Comment acknowledged; No response required.
3. Two trees are shown as being preserved but also one appears to be impacted by grading. Please add tree protection fencing around the tree to be saved.
The grading has been revised to save the tree impacted by grading. See sheet C4.0.
4. Please add a note stating that any off-site trees negatively impacted by its construction shall be replaced.
The note mentioned has been added to sheets C3.1, L1.0, and L1.2 stating that any off-site trees negatively impacted by construction shall be replaced.

Adjacent to Public Rights-of-Way – Berm/Wall, Buffer and Street Trees (Zoning Sec. 5.5.3.B.ii, iii)

1. **A landscape waiver is required for the lack of berms along both West Oaks Drive and Novi Road.** It would be supported by staff because hedges are provided to screen the drive-thru lanes from both roads.
The landscape waiver is still being requested for this site plan package in lieu of hedges for screening.
2. **A landscape waiver to not provide trees within the watermain easement along West Oaks Drive should be requested.**

A waiver for trees in the watermain easement is not necessary with the revised site plan.

Parking Lot Landscaping (Zoning Sec. 5.5.3.C.)

1. Per the vehicular use area, the required landscape area and interior trees are not provided but it appears that they could be with correct labeling and identification. **Please correct the calculation as shown on the landscape chart, label interior islands and corners with interior trees with their SF, and add the required trees if necessary.**
Vehicular use area calculation has been corrected on sheet L1.1, and interior islands and corners with interior trees have been label with their SF on sheet L1.1.
2. **See the detailed discussion** regarding parking lot perimeter trees and accessway perimeter tree placement.
Comment Acknowledged; see detailed discussion for more response.
3. **A landscape waiver to not plant accessway perimeter trees within the watermain easement would be supported by staff.**
A landscape waiver as mentioned is not being requested for the revised plans.
4. **A landscape waiver for the deficient perimeter depth between the west drive and west property line is required.** It would be supported by staff if Engineering and/or Traffic require that the curb cut remain as it is.
A waiver for the deficient perimeter depth will still be required for the west property line and access drive.
5. The bay just north of the building is in effect 17 spaces (the dumpster access way is 2 spaces), plus 2 accessible spaces aisles extend the bay even further. **This required a landscape waiver.** It would not be supported by staff. **Please add a 200sf island on the east or west side of the dumpster access way.**
The plans have been revised to include a 200+ SF island the east side of the dumpster access way with any additional trees required, see sheet C3.0.

Building Foundation Landscaping (Zoning Section 5.5.3.D)

1. Calculations and hatched area showing proposed landscape areas are provided.
Comment Acknowledged
2. **Please add labels showing the SF of the different foundation landscaping areas.**
Labels showing SF of building foundation plantings added to sheet L1.1

Plant List (LDM 4, 10)

1. 14 of 19 species used (74%) are native to Michigan.
Comment Acknowledged.
2. The number of red maples used exceeds the 15% maximum. **Please reduce the number of red maples to meet the diversity requirement.**
The number of Red Maples reduced to 12, with Thornless Honey Locust increased to 10 and Tupelo increased to 11, see sheet L1.0.

Planting Notations and Details (LDM 10)

1. All required notes are provided.
Comment Acknowledged.
2. Please add any additional planting details that may be required.

Storm Basin Landscape (Zoning Sec 5.5.3.E.iv and LDM 3)

1. No above-ground detention is proposed.
Correct, no response required.
2. **If above-ground detention is required by Engineering, the basin must be landscaped per the current ordinance.**
Comment acknowledged. Above-ground detention is not required.

Irrigation (LDM 10)

1. An irrigation system plan is provided.
Comment acknowledged.
2. It will be reviewed by our cross-connection specialist.
Comment acknowledged.

2024-0212 – LANDSCAPE REVIEW SUMMARY CHART COMMENTS

Note: for clarity in responses, comment items where the Meets Code column was marked “Yes” or “NA” have been omitted in the table below.

Item	Required	Proposed	Meets Code	Comments	Response
Landscape Plan requirements (Landscape Design manual (LDM) and Zoning Ordinance (Zoning Sec))					
Landscape Plan (Zoning Sec 5.5.2, LDM 2,10)	-New commercial or residential developments -Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less. -1" = 20" minimum with proper North. Variations from this scale can be approved by LA -Consistent with plans throughout set	Scale: 1" = 20"	Yes		Comment Acknowledged
Project Information (LDM 10)	Name and Address	Yes	Yes		Comment Acknowledged

Item	Required	Proposed	Meets Code	Comments	Response
Owner/Developer Contact Information (LDM 10)	Name, Address, and telephone number of the owner and developer or association	Only on cover sheet	No	Please add the information to the title block of the landscape plan and other sheets.	Name, address, and number of owner/developer has been added to title block
Landscape Architect contact information (LDM 10)	Name, address and telephone number of RLA/PLA/LLA who created the plan	John Ackerman, PLA – Kimley-Horn of Michigan	Yes		Comment Acknowledged
Sealed by LA. (LDM 10)	Requires original signature	None		<u>Signature and seal of LA is required on the printed stamping sets.</u>	Signature and seal of LA will be provided on printed stamped sets
Miss Dig Note (800) 482-7171 (LDM 10)	Show on all plan sheets	Yes	Yes		Comment Acknowledged
Zoning (LDM 10)	Include all adjacent zoning	-Parcel: R-C with PD-2 option - <u>North South, East, West</u> : R-C	Yes/No	<u>Please show the zoning of the parcels north and south of the site.</u>	RC Zoning labeled on parcels north and south of site
Survey Information (LDM 10)	- <u>Legal description of boundary line survey</u> - <u>Existing topography</u>	-Legal description on Sheet 1 -Topographical survey is on sheet C-2.0	Yes		
Existing plant material Existing woodlands or wetlands (LDM 10)	- <u>Show location type and size. Label to be saved or removed.</u> - <u>Plan shall state if none exists.</u>	-Tree survey is shown on Sheet C2.0 -Removals are indicated on same sheet -Tree Chart is shown on Sheet L-1.0 -There are no wetlands or regulated	-Yes -Yes -Yes -Yes	1. As there are no regulated trees being removed (not 36" dbh or greater and not in a regulated woodland), no replacements are required for any trees removed from the site. 2. Trees #1286 and #1287 are shown as being saved, but it appears that #1287 will be significantly impacted by the grading. Please	1. Comment Acknowledged 2. Grading has been revised to avoid Tree #1287 3. Note added on sheets C3.1, L1.0 and L1.2 noting that any off-site trees that are negatively impacted by the sewer line

Item	Required	Proposed	Meets Code	Comments	Response
		woodlands on the site		revise the grading or show it as being removed. 3. Any of those off-site trees that are negatively impacted by the sewer line construction must be replaced with similar plant material. Please add a note to that effect to the relevant plan sheet and the landscape plan.	construction shall be replaced in kind by contractor
Soil Types (LDM 10)	-As determined by soils survey of <u>Oakland county</u> -Show types, boundaries	-Sheet L-1.0 -Entire site is Marlette sandy loam	Yes		Comment Acknowledged
Existing and Proposed Improvements (LDM 10)	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	Yes	Yes	Please extend the 'finger' between the west drive and the drive-thru lanes as much as possible to the north to increase the amount of greenspace on the site.	See sheet C3.0, the landscape island has been extended as mentioned.
Existing and Proposed Utilities (LDM 10)	-Overhead and underground utilities, including hydrants -Show all existing and proposed light posts on the site.	-All utility lines and structures are shown on the landscape plan -Proposed lighting is shown	-Yes -Yes	Please show the utility easement boundary lines on the landscape plan so it is clear where trees shouldn't be planted.	Utility easement boundary lines have been labeled and dimensioned more clearly on sheet L1.2
Proposed grading, 2' contour minimum (LDM 10)	Provide proposed contours at 2' interval	• Sheets 4 and 4.1 • No berms are proposed	• Yes • No	A landscape waiver is requested for the lack of the required berms.	Applicant and Engineer are aware of this requirement, and comments above say that screening may be provided in lieu of landscaping berms.

Item	Required	Proposed	Meets Code	Comments	Response
Snow deposit (LDM 10)	Show snow deposit areas on plan	Yes	Yes		Snow deposit areas have been added to the plans. See Sheet L1.2.
Parking Area Landscape Requirements (Zoning Sec 5.5.3.C and LDM 5)					
General Requirements (LDM 5)	-Clear sight distance within parking islands -No evergreen trees	Clear vision zones shown for all entries	Yes	<u>The clear zone is not required at the drive-thru lanes for this layout</u>	Clear zone line has been removed at the drive-thru lanes on sheet L1.2
Name, type and number of ground cover (LDM 5)	As proposed on planting islands	Groundcovers for all areas are indicated with different hatching patterns.	Yes		Comment Acknowledged
General (Zoning Sec 5.5.3.C)					
Parking Lot Islands	-A minimum of 200 SF to qualify -A minimum of 200 SF unpaved area per tree planted in an island -6" curbs -Islands minimum width 10' BOC to BOC	All islands appear to be sufficiently large but their areas in SF are not provided	Yes/No	1. Please add SF area tags for all area to be counted toward the parking lot interior requirement 2. The island at the northeast corner of the building with the hydrant does not provide enough room for the tree there. Please move the sidewalk or enlarge the island to provide sufficient room and green space for that tree.	1. Landscape SF has been labeled on sheet L1.1 to show interior landscape areas 2. Island has been enlarged to provide more room for tree
Curbs and Parking stall reduction (Zoning Sec 5.3.12)	Parking stall can be reduced to 17' and the curb to 4" adjacent to a sidewalk of minimum 7 ft.	Spaces are shown as 17' long where they abut greenspace and 19 feet long when they abut a 5-foot sidewalk.	Yes		Comment Acknowledged

Item	Required	Proposed	Meets Code	Comments	Response
Contiguous space limit (Zoning sec 5.5.3.C)	Maximum of 15 contiguous spaces	15 spaces plus the 2-space access way for the dumpster, is the maximum bay length	No	1. Please add a 200 SF landscaped island on the long bay north of the building, east or west of the dumpster entry, to break up the long bay. 2. A landscape waiver would be required for the long bay. It would not be supported by staff	A 200+ SF landscape island has been added to the east of the dumpster entry along with required landscape
Plantings around Fire Hydrant (Zoning Sec 5.5.3.C)	-No plantings with matured height greater than 12' within 10ft. of fire hydrants -Plant trees at least 5ft from water and storm lines and 10 feet from sanitary lines -Plantings near hydrants or FDCs should be no taller than 12"	-One hydrant is shown northeast of the building -A Fire Department Connection is shown on the north side of the building with a note indication that the plantings in front of it shall not be taller than 12".	-Yes -Yes		Comments Acknowledged
Landscaped Area (Zoning Sec 5.5.3.C)	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	Yes	Yes		Comment Acknowledged
Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, NCC, EXPO, FS, TC, TC-1, RC, Special Land Use or non-residential use in any R district (Zoning Sec 5.5.3.C)					
A = total square footage of vehicular use area up to 50,000 SF x 7.5%	-A = x SF * 7.5% = A SF -11911 * 7.5% = 893 SF	Calculations proposed	No	Please correct the calculation to remove the subtraction part. That is incorrect.	Calculation has been corrected and shown on sheet L1.1
B = Total square footage of additional paved vehicular use area (not including A or B) over 50,000 SF x 1%	-B = x SF * 1% = B sf - (xxx – 50000) * 1% = xx SF	NA			
Category 2: For: I-1 and I-2 (Zoning Sec 5.5.3.C)					

Item	Required	Proposed	Meets Code	Comments	Response
A = Total square footage of vehicular use area up to 50,000 SF x 5%	$A = x \text{ sf} \times 6\% = A \text{ sf}$	NA			
B = Total square footage of additional paved vehicular use areas over 50,000 SF x 0.5%	$B = 0.5\% \times 0 \text{ SF}$	NA			
All Categories					
$C = A + B$ Total square footage of landscaped islands	$C = A + B$ $C = 893 + 0 = 893 \text{ SF}$	514 SF	No	1. A waiver is required for the deficiency. It would not be supported by staff. 2. Please provide all of the required area.	Additional landscape has been added to meet requirement and calculations have been updated on sheet L1.1
$D = C/200$ Number if canopy trees required	$D = C/200$ $893/200 = 4 \text{ trees}$	3 trees	No	1. A Waiver is required for the deficiency. It would not be supported by staff. 2. Please provide all of the required trees.	1 additional tree has been added to meet requirement
Perimeter Green space (Zoning Sec 5.5.3.C)	1 Canopy tree per 35 lf - North side: $192/35 = 5 \text{ trees}$ - South side: $65/35 = 2 \text{ trees}$	North side: 8 trees South side: 1 tree	- Yes - No	Please move one of the northern perimeter trees so there are two perimeter trees west of the dumpster.	Plans have been adjusted per this comment. See Sheet L1.2.
Accessway perimeter (Zoning Sec 5.5.3.C)	1 canopy tree per 35 lf on each side of road, less widths of access drives. West accessway: $(228+150)/35 = 11 \text{ trees}$ Drive-thru accessway including east edge	Exterior accessway Only 6 feet od provided between the drive and the property line.	- No - Yes - Yes - Yes - No	1. Please shift the drive over 4 feet to provide the required 10 feet of space. A waiver for the space deficiency is required for the proposed layout. It would only be supported of Engineering and/or Traffic determine the entry cannot be shifted.	1. A waiver is being requested for the deficiency. 2. Trees along western access drive have been spread out and spaced evenly

Item	Required	Proposed	Meets Code	Comments	Response
	of northeastern accessway: - Inner edge: $(128 + 36 + 35 + 95) / 35 = 6$ trees - Outer edge: $530 / 35 = 15$ trees Northeastern accessway: $95.35 = 2$ trees	11 trees are provided along the drive Drive-thru accessway: - Inner edge - Outer edge: 18 trees (3 shared with western outer drive) Northeastern accessway - West side of northeastern accessway drive: 1 tree		2. <u>Please spread the trees along the western access drive out so they reach the start of the clear vision zone, are fairly equally spaced and don't crowd the tree on the adjoining property.</u> 3. Please remove the red oak near the north entrance east to within 10 feet of the accessway curb. 4. If possible, please extend the greenspace in the interior drive-thru island in place of at least some of the striped pavement west of the island to increase the site's green space. 5. A waiver to not provide 1 tree along the outer edge of the interior drive within the watermain easement would be supported by staff.	3. The Red Oak near the north entrance has been moved further east to be 10 feet from accessway curb 4. Interior drive thru island has been extended in place of striped pavement 5. This waiver is not necessary for the revised site plan layout.
Residential Adjacent to Non-residential (sec 5.5.3.A & LDM 1.a)					
Berm Requirements (Zoning Sec 5.5.A)	The site is not adjacent to residential property so this screening berm is not required	None	Yes		Comment Acknowledged
Adjacent to Public Rights-of-Way (Sec 5.5.3.B and LDM 1.b)					
Berm requirements (Zoning Sec 5.5.3.A.(5))	An undulating berm a minimum 2 feet high with a 3 foot wide crest is required	No berm is proposed	No	A landscape waiver is required for the lack of a berm. As a screening hedge is proposed for most of the frontages, it would be supported by staff.	No berm is proposed and a waiver will be provided to have a screening hedge in lieu of a

Item	Required	Proposed	Meets Code	Comments	Response
					proposed screening berm.
Cross-Section of Berms (LDM 10)					
Slope, height and width	• Label contour lines • Maximum 33% • Min. 3 feet flat horizontal area • Minimum 3 feet high • Constructed of loam with 6' top layer of topsoil	No berms are proposed			
Type of Ground Cover		NA			
Walls (Zoning Sec 5.5.3.A & LDM 10)					
Material, height and type of construction footing	Freestanding walls should have brick or stone exterior with masonry or concrete interior	No walls are indicated	TBD		No walls are proposed except at the dumpster enclosure.
Walls greater than 4 ft. should be designed and sealed by an Engineer		NA			
ROW Landscape Screening Requirements (Zoning sec 5.5.3.B.ii)					
Greenbelt width	Adj to Parking: 20 ft.	• Novi Road: 25 ft • West Oaks Dr: 20 ft	• Yes • Yes		Novi Road: the site plan has been adjusted so that the asphalt parking is not located within the 25' greenbelt. See Sheet C3.0. West Oaks: the site plan has been adjusted so the asphalt parking is not located within

Item	Required	Proposed	Meets Code	Comments	Response
					the 20 ft. greenbelt. See Sheet C3.0.
Min. berm crest width	Adj to Parking: 2 ft.	None	No	As noted above, a landscape waiver is required for the lack of a berm. As a screening hedge is proposed for most of the frontage, it would be supported by staff	See response to berm comment above.
Minimum berm height	Adj to Parking: 3 ft.	None	No	See above	See response to berm comment above.
3' Wall	(2) (3) (4)	No			
Canopy deciduous or large evergreen trees	- Adj to Parking: 1 tree per 35 lf - Novi Road: $217/35 = 6$ trees - West Oaks Dr: $285/35 = 8$ trees	- Novi road: 7 trees (double-counted accessway perimeter trees) - West Oaks Dr: 8 trees (8 double-counted accessway perimeter trees).	- Yes - Yes		Comment Acknowledged
Sub-canopy deciduous trees)	- Adj to Parking: 1 tree per 20 lf - Novi Road: $217/20 = 11$ trees - West Oaks Dr: $286/20 = 14$ trees	- Novi Road: 11 trees - West Oaks Dr: 11 trees	- Yes - No	A waiver to not plant trees within the 75 feet of West Oaks frontage occupied by the water main easement would be supported by staff.	Novi Road: no response required West Oaks: a waiver to this effect will be requested.
Canopy deciduous trees in area between sidewalk and curb	- Parking & No Parking 1 tree per 45 lf - Novi Road: $(217-120)/45 = 3$ trees (120 lf is shown as in the RCOC "no plant" zone)	- Novi road: 5 subcanopy trees near overhead wires - West oaks Dr: 6 trees	- Yes - Yes	As the Road Commission does not allow plantings between the sidewalk and road along Novi Road, those trees do not need to be provided at all, but correspondence from RCOC showing that should be provided to the City.	The five sub-canopy trees along Novi Road have been removed and therefore the waiver is no longer necessary.

Item	Required	Proposed	Meets Code	Comments	Response
	West Oaks Dr: (307-70)/45 = 5 trees				
Screening of outdoor storage, loading/unloading (Zoning Sec. 3.14, 3.15, 4.55, 4.56, 5.5)	The loading zone must be screened from roads	The proposed loading zone is partially blocked by greenbelt plantings from view of West Oaks Drive.	TBD	1. The proposed shrubs will not attain a height sufficient to screen trucks in the loading zone from West Oaks and Novi Road. 2. Please switch those plantings to taller, fuller species that will provide the required screening. 3. As they were, a landscape waiver would be required. It would not be supported by staff.	Height and species of proposed shrubs are tall enough to screen a vehicle in the proposed loading zone.
Transformers/Utility boxes (LDM 6)	- A minimum of 2ft. separation between box and the plants - Ground cover below 4" is allowed up to pad. - No plant materials within 8 ft. from the doors	No transformer is shown	TBD	1. When transformer <u>locations are finalized, screening shrubs per standard detail are required.</u> 2. <u>Please add the City utility box screening detail to plans.</u> 3. <u>City of Landscape Note #13 should read 4 sides should be screened, not 3</u>	1. Comments acknowledged, and will be addressed once transformer location is finalized. 2. The City screening detail has been added to sheet 3. The note mentioned has been revised.
Building Foundation Landscape Requirement (Zoning Sec 5.5.3.D)					
Interior Site Landscaping SF (Zoning Sec 5.5.3.D)	- Equal to the entire perimeter of the building x 8. - A: (283-16.42) lf x 8ft = 2,133 SF - Plantings beds should have a minimum width of 4 ft	2192 sf – not noted	TBD	1. Shaded areas indicate that sufficient area is provided but the areas' SF is not provided 2. Please label all foundation landscaped area with their SF so the calculation can be verified.	1. SF of landscape has been labeled to show sufficient proposed landscape 2. SF has been added.

Item	Required	Proposed	Meets Code	Comments	Response
Building Frontage Landscaping (Zoning Sec 5.5.3.D)	If visible from public street minimum of 60% of the exterior building perimeter should be covered in green space	• Novi Road: 100% • West Oaks DR: 100%	• Yes • Yes	The greenbelt hedge may be included in the West oaks Drive frontage calculation since it blocks the view of the building from West Oaks Drive.	Comment Acknowledged
Detention/Retention Basin Requirements (Zoning Sec 5.5.3.E & LDM 3)					
Planting requirements (Zoning Sec 5.5.3.E & LDM 3)	• Clusters of large native shrubs shall cover 70-75% of the basin rim area at 10 lf from permanent water level • 10" to 14" tall grass along sides of basin • Refer to wetland for basin mix • Deciduous canopy tree 1/35 of east, south and west sides of pond at 10 feet from permanent water level	No above-ground detention is shown	TBD	If above-ground detention is provided, it must be landscaped per the current ordinance.	No above-ground detention is proposed.
Phragmites and Japanese Knotweed Control (Zoning Sec 5.5.6.B)	• Any and all populations of Phragmites australis and/or Japanese Knotweed on site shall be included on tree survey. • Treat populations per MDEQ guidelines and requirements to eradicate the weed from the site.	A note indicates there is none of either weed on the site	Yes		Comment acknowledged. See comment 2 on Sheet L1.0.
LANDSCAPING NOTES, DETAILS AND GENERAL REQUIREMENTS					
Landscape Notes – Utilize City of Novi Standard Notes					
Installation Date (LDM 10)	Provide intended date	Between March 15 and Nov 15	Yes		

Item	Required	Proposed	Meets Code	Comments	Response
Maintenance & Statement of intent (Zoning Sec 5.5.6 & LDM 10)	• Include statement of intent to install and guarantee all materials for 2 years. • Include a minimum one cultivation in June, July and August for the 2-year warranty period.	Both notes are provided	Yes		
Irrigation plan (LDM 10)	• A fully automatic irrigation system or a method of providing sufficient water for plant establishment and survival is required on Final Site Plans. • If irrigation won't be used, note how trees will get sufficient water for establishment and long-term survival	Provided	TBD	The irrigation plan will be reviewed by our cross-connection specialist.	See Sheets IR-1 through IR-3 for the revised irrigation plans.
Establishment Period (Zoning Sec 5.5.6 & LDM 10)	2 yr. Guarantee	Yes	Yes	<u>If the developer does only require a 1-year guarantee from their contractor, then Landscape Note #7 can remain as is, but the developer is responsible for a 2-year guarantee.</u>	Landscape Note #7 has been adjusted to show 2-year guarantee
Approval of Substitutions (Zoning Sec 5.5.6 & LDM 10)	City must approve any substitutions in writing prior to installation.	Yes	Yes		
Plant List (LDM 10 & 11) – Include all cost estimates					
Quantities and sizes	• At least 50% of species used shall be native to Michigan	Yes	Yes		Comment Acknowledged
Root type	• Tree diversity shall follow guidelines of	Yes	Yes		Comment Acknowledged

Item	Required	Proposed	Meets Code	Comments	Response
Botanical and common names (LDM 4 & 11)	LDM Section 4	• 14 of 19 species (74%) are native to Michigan • Too many red maples are used (21%)	• Yes • No	1. Please reduce the number of red maples used to no more than 12 (15%). 2. This can be done by adding a species or using more of the species with less than 12 trees on site.	1. Quantity of Red Maples has been reduced to no more than 12
Type and amount of lawn		• Different groundcovers are indicated with hatching • Areas (in SF) of seed and sod are not indicated	Yes		Comment Acknowledged
Cost estimate (LDM 10)	For all new plantings, mulch and sod as listed on the plan	No		1. Please add to final site plan. 2. Areas and costs of seed, sod and mulch should be included in the cost estimate 3. Use these standard costs: • Canopy tree: \$400 ea • Lg evergreen: \$375 ea • Ornamental: #375 ea • Shrub: \$50 ea • Perennial/ornamental grass: \$15 ea	1. Approximate SF of sod and mulch has been added to plans 2. Cost estimate table has been added using the suggested cost estimate numbers
Planting Details/ Info (LDM Prat III) – Utilize City of Novi Standard Details					
Canopy Deciduous Tree	Refer to LDM for detail drawings	Yes	Yes		

Item	Required	Proposed	Meets Code	Comments	Response
Evergreen Tree		No	No	Please add if any evergreen trees will be used.	No evergreens are proposed.
Multi-stem Tree		No	TBD	Please add if any multi-stem trees will be used.	None proposed.
Shrub		Yes	Yes		
Perennial/ Ground Cover		Yes	Yes		
Tree stakes and guys. (Wood stakes, fabric guys)		Yes	Yes		
Tree protection fencing	Located at Critical Root Zone (1' outside of dripline)	• 2 on-site trees are shown as being saved • Tree protection detail is on L-1.0	• No • Yes	<u>Please show protective tree fence on the Demolition and/or Soil Erosion Control plan to protect any saved trees or trees on adjacent properties within 50 feet of disturbance, including off-site trees near the sanitary sewer extension.</u>	Tree protection fencing has been shown around Tree #1286 on sheet C6.0?
Other Plant Material Requirements (LDM 11)					
General Conditions	Plant materials shall not be planted within 4 ft. of property line	The trees west of the west drive are within 4 feet	No	Please move the drive eastward to provide the required spacing	Waiver for plant materials will be requested.
Landscape tree credit (LDM 11)	• Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA. • Refer to Landscape tree Credit Chart in LDM	None proposed			This project does not propose any Landscape Tree Credit at this time.
Plant Sizes for ROW, Woodland replacement and others (LDM 11)	• Size determined by use detailed in LDM Table 11.b.(2)a.i	On plant list	Yes		

Item	Required	Proposed	Meets Code	Comments	Response
	Indicate on plant list				
Plant size credit (LDM 11)	NA	No			This project does not propose any Landscape Tree Credit at this time.
Prohibited Plants (LDM 11.b)	No plants on City Invasive Species List	No prohibited plants are proposed	Yes		
Recommended trees for planting under overhead utilities (LDM 11)	Label the distance from the overhead utilities	- Overhead lines are shown along Novi Road - Subcanopy trees are proposed as street trees there	Yes	The subcanopy street trees are not required if the RCOC does not allow street trees between the sidewalk and road.	The five sub-canopy trees along Novi Road have been removed and correspondence from RCOC showing this waiver will be provided
Nonliving Durable Material: Mulch (LDM 11)	- Trees shall be mulched to 3" depth and shrubs, groundcovers to 2" depth - Specify natural color, finely shredded hardwood bark mulch. Include in cost estimate.	On details	Yes		

Irrigation System Requirements

- Any booster pump installed to connect the project's irrigation system to an existing irrigation system must be downstream of the RPZ.
See the revised irrigation plans IR-1 through IR-3.
- The RPZ must be installed in accordance with the 2015 Michigan Plumbing Code.
See the revised irrigation plans IR-1 through IR-3.
- The RPZ must be installed in accordance with the manufacture installation instructions for winterization that includes drain ports and blowout ports.
See the revised irrigation plans IR-1 through IR-3.

4. The RPZ must be installed a minimum of 12-inches above FINISHED grade.
See the revised irrigation plans IR-1 through IR-3.
5. Attached is a handout that addresses winterization installation requirements to assist with this.
See the revised irrigation plans IR-1 through IR-3.
6. A plumbing permit is required.
A plumbing permit will be submitted.
7. The assembly must be tested after installation with results recorded on the City of Novi test report form.
See the revised irrigation plans IR-1 through IR-3.

2024-0227 – REVISED PRELIMINARY TRAFFIC REVIEW (JSP23-37) COMMENTS

General

1. The applicant, PEA Group, is proposing a 4,106 SF Culver's restaurant.
PEA Group is no longer the applicant.
2. The development is located on the south side of Karevich Drive, north of West Oaks Drive and west of Novi Road. Karevich Drive and West Oaks Drive are under the jurisdiction of the City of Novi. Novi Road is under the jurisdiction of the Road Commission for Oakland County.
Comment acknowledged. No response required.
3. The site is zoned RC (Regional Center).
Comment acknowledged. No response required.
4. The following traffic related deviations may be required if plans are not revised:
 - a. Below standard radius at one driveway.

Response: Plans have been revised to avoid a deviation for this item. See Sheet C3.0.

- b. Below standard bicycle parking layout.

Response: Plans have been revised to avoid a deviation for this item. See Sheet C3.0.

- c. Below minimum clear path width to bicycle parking.

Response: minimum clear path width will be adjusted as part of Final Site Plan.

- d. Inconclusive if the required stacking spaces in drive-through are met.

Response: Passenger cars have been added to the Site Plan. See sheet C3.0.

5. The applicant has indicated the following deviations will be requested:
 - a. Dumpster location.

Response: no response required.

- b. Front setback below standard.

Response: no response required.

Traffic Impacts

1. AECOM performed an initial trip generation based on the ITE Trip Generation Manual, 11th Edition, as follows.

ITE Code: 934 – Fast-Food Restaurant with Drive-Through Window Development-specific
Quantity: 4,106 GLA

Trip Generation Summary	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
AM Peak-Hour Trips	183	93	100	No
PM Peak-Hour Trips	135	70	100	No
Daily (One-Directional) Trips	1,917	N/A	750	Yes

2. The City of Novi generally requires a traffic impact study/statement if the number of trips generated by the proposed development exceeds the City's threshold of more than 750 trips per day or 100 trips per either the AM or PM peak hour, or if the project meets other specified criteria.

Trip Impact Study Recommendation	
Type of Study:	Justification
Traffic Impact Study	A revised traffic study was submitted and approved with no pending comments. Revised TIS: An evaluation of the parking related to the proposed development was completed following the city zoning ordinance. This calculates to 48 spaces. The development is proposing 48 parking spaces, which meets the City's zoning ordinance.

TRAFFIC REVIEW

The following table identifies the aspects of the plan that were reviewed. Items marked O are listed in the City's Code of Ordinances. Items marked with ZO are listed in the City's Zoning Ordinance. Items marked with ADA are listed in the Americans with Disabilities Act. Items marked with MMUTCD are listed in the Michigan Manual on Uniform Traffic Control Devices.

The values in the 'Compliance' column read as 'met' for plan provision meeting the standard it refers to, 'not met' stands for provision not meeting the standard and 'inconclusive' indicates applicant to provide data or information for review and 'NA' stands for not applicable for subject Project. The 'remarks' column covers any comments reviewer has and/or 'requested/required variance' and 'potential variance'. A potential variance indicates a variance that will be required if modifications are not made or further information provided to show compliance with the standards and ordinances. The applicant should put effort into complying with the standards; the variances should be the last resort after all avenues for complying have been exhausted. Indication of a potential variance does not imply support unless explicitly stated.

EXTERNAL SITE ACCESS AND OPERATIONS

No.	Item	Proposed	Compliance	Remarks	Response
1	Driveway Radii O Figure IX.3	6', 30' and matching existing	Partially Met	6' does not meet 15' minimum requirement. A mountable concrete median drive approach has been added. The applicant has not indicated if they will be requesting a deviation. Provide truck turning movements for anticipated delivery trucks that need to get to the loading zone.	Driveway radii have been revised to meet min. 15', except at mountable concrete median drive approach, where large majority of turns will be lefts from the relocated N Karevich Dr access drive
2	Driveway Width O Figure IX.3	24'	Met	Within range.	
3	Driveway Taper O Figure IX.11				
3a	Taper length	-	N/A		
3b	Tangent	-	N/A		
4	Emergency Access O 11-194.a.19	2 access points	Met		
5	Driveway sight distance O Figure VIII-E	Not indicated	N/A	For major through roads.	
6	Driveway spacing				
6a	Same-side O 11.216.d.1.d	-	N/A		
6b	Opposite side O 11.216.d.1.e	-	N/A		
7	External coordination (Road agency)	-	N/A	No changes proposed to Novi Road.	

EXTERNAL SITE ACCESS AND OPERATIONS

No.	Item	Proposed	Compliance	Remarks	Response
8	External Sidewalk Master Plan & EDM	Proposed 8' walk along Novi Road and 5' connection to site	Met		
9	Sidewalk Ramps EDM 7.4 & R-28-K	Indicated	Partially Met	Include standard detail R- 28-K in future submittal.	Will be submitted in future submittals

					.
10	Any Other Comments:				

INTERNAL SITE OPERATIONS

No.	Item	Proposed	Compliance	Remarks	Response
11	Loading zone ZO 5.4	500 SF required, 1,010 proposed	Met		
12	Trash receptacle ZO 5.4.4	Proposed directly next to the building on the west side	Not Met	The applicant is requesting a deviation for location of dumpster.	Deviation is still being requested.
13	Emergency Vehicle Access	Turning movements provided	Met		
14	Maneuvering Lane ZO 5.3.2	20' and 30'	Met		
15	End islands ZO 5.3.12				
15a	Adjacent to a travel way	Dimensioned	Met	3' shorter than adjacent space.	
15b	Internal to parking bays	Provided	Met	Internal islands not required to be 3' shorter than adjacent parking.	
16	Parking spaces ZO 5.2.12	56 including 3 accessible spaces		See Planning review letter. The site data table lists 53 spaces but the site plan total shows 56 spaces.	A total of 48 spaces are proposed with the revised site, as required.
17	Adjacent parking spaces ZO 5.5.3.C.ii.i	<15 spaces in all parking bays	Met		

18	Parking space length ZO 5.3.2	17' and 19' perpendicular spaces, 18' angled spaces, parallel spaces not dimensioned	Partially Met	Dimension parallel parking spaces in future submittal.	Parallel spaces are dimensioned, see the site plan, sheet C3.0
19	Parking space Width ZO 5.3.2	8' parallel spaces and 9'	Met		

INTERNAL SITE OPERATIONS

No.	Item	Proposed	Compliance	Response	
20	Parking space front curb height ZO 5.3.2	Not Indicated	Inconclusive	Provide in future submittal, 6" standard in front of 19' parking spaces, 4" standard with 2' overhang in front of 17' spaces. Flush curb noted on site plan in front of some of the parking spaces. Provide detail of bumper blocks in future submittal.	This will be provided in a future submittal.
21	Accessible parking – number ADA	3	Met		No response required.
22	Accessible parking – size ADA	8' with 5' or 8' aisle	Met		No response required
23	Number of Van-accessible space ADA	1	Met		No response required.
24	Bicycle parking				
24a	Requirement ZO 5.16.1	4 required, 4 proposed	Met		No response required.
24b	Location ZO 5.16.1	Provided	Met		
24c	Clear path from Street ZO 5.16.1	6' required	Inconclusive	Dimension the width of the sidewalk from the crosswalk to the bicycle parking to ensure the 6' requirement is met.	Dimensions have been added to the site plan, sheet C3.0
24d	Height of rack ZO 5.16.5.B	3' required	Met	Separate detail provided, include in plan set in future submittal.	This will be provided in a future submittal.

24e	Other (Covered / Layout) ZO 5.16.1	Partially dimensioned	Not Met	Refer to Text Amendment 18.301 for updated layout requirements.	
25	Sidewalk – min 5' wide Master Plan	5'	Met		
26	Sidewalk ramps EDM 7.4 & R-28-K	Not indicated at accessible spaces.	Inconclusive	Label on plan and provide detail in future submittal.	This will be provided in a future submittal.
27	Sidewalk – distance back of curb EDM 7.4	-	N/A		
28	Cul-De-Sac O Figure VIII-F	-	N/A		
29	EyeBrow O Figure VIII-G	-	N/A		
30	Stacking Spaces ZO 5.3.11.I	Partially dimensioned	Partially Met	Dimension length of stacking space in future submittal	The site plan has been updated to show cars stacking between the board and window and before the board. See Sheet C3.0.

INTERNAL SITE OPERATIONS

No.	Item	Proposed	Compliance	Remarks	Response
31	Any Other Comments:	Minimum 25' drive-through lane centerline radius provided. 48 parking spaces are required; the applicant could remove the 8 parallel parking spaces along the back of the site (or at least the 4 right in front of the drive-thru) since those spaces could interfere with drive-thru traffic.			Comment acknowledged. The site plan has been updated with a new parking configuration. See Sheet C3.0.

SIGNING AND STRIPING

No.	Item	Proposed	Compliance	Remarks	Response
32	Signing: Sizes MMUTCD	No Parking Fire Lane sign included	Partially Met	Include all proposed signs in future submittal.	See sheet C3.0 for proposed signs and C9.0 for the new signage sheet.
33	Signing table: quantities and sizes	Not included	Not Met	Include in future submittal.	Will include in final site plan submittal.
34	Signs 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U- channel post MMUTCD	Indicated for No Parking Fire Lane sign	Partially Met	Include for all proposed signs in future submittal.	See site plan notes #3 on sheet C3.0
35	Signs greater than 12" x 18" shall be mounted on a galvanized 3 lb. or	Indicated for No Parking Fire	Partially Met	Include for all proposed signs in future submittal.	See site plan notes #3 on sheet C3.0

	greater U-channel post MMUTCD	Lane sign			
36	Sign bottom height of 7' from final grade MMUTCD	Indicated for No Parking Fire Lane sign	Partially Met	Include for all proposed signs in future submittal.	See site plan notes #3 on sheet C3.0
37	Signing shall be placed 2' from the face of the curb or edge of the nearest sidewalk to the near edge of the sign MMUTCD	Not included	Not Met	Include in future submittal.	Included on sheet C3.0
38	FHWA Standard Alphabet series used for all sign language MMUTCD	Not included	Not Met	Include in future submittal.	See site plan notes #3 on sheet C3.0
39	High-Intensity Prismatic (HIP) sheeting to meet FHWA retro-reflectivity MMUTCD	Not included	Not Met	Include in future submittal.	See site plan notes #3 on sheet C3.0
40	Parking space striping notes	4" proposed	Partially Met	Indicate color of all proposed markings in future submittal.	Will include in final site plan submittal.
41	The international symbol for accessibility pavement markings ADA	Not included	Not Met	Include in future submittal.	The proposed ADA spaces will utilize the international pavt markings for ADA
42	Crosswalk pavement marking detail	Not included	Not Met	Include in future submittal.	Will be included in future submittal.
43	Any Other Comments:	Provide details for arrows, drive-thru, stop, and hatched pavement markings. The applicant should indicate the reason for the left turn-only sign after the drive-thru with the two-way street in front.			

Traffic Impact Review - AECOM

The Traffic Impact Study was reviewed to the level of detail provided and AECOM recommends denial of the Traffic Impact Study (parking evaluation); the applicant should review the comments provided below and provide a revised study to the City.

**** Some review information omitted since response is not necessary ****

SITE TRIP GENERATION

1. A total of 1,919 daily trips are anticipated based on the ITE trip generation for 'Fast Food Restaurant with Drive Through Window' code 934.
2. A total of 55% of trips are considered pass-by trips during the afternoon peak hours (m.d. and p.m.). And a net increase of approx. 104 trips during the afternoon peak hour (m.d.) and approx. 61 trips during the evening peak hour (p.m.) are considered for a traffic impact study on the surrounding road network.

SITE TRAFFIC ASSIGNMENT

1. The largest portion of the traffic is assumed to be coming from/going to Novi Road followed

by Twelve Oaks Mall Road and W Oaks Drive. The directions that site traffic will travel to and from were based upon existing traffic patterns during the m.d. and p.m. peak hours.

FUTURE CONDITIONS

1. Operations at the signalized intersections are not expected to deteriorate significantly at the study area intersections except at Oaks Drive South and Karevich Drive/Site Driveway (stop-controlled).
2. Excessive delay (LOS F) at Karevich Drive/Site driveway. However, the 95th percentile queues for the SB approach of the Oaks Drive South and Karevich Drive/Site Driveway intersection are 96 feet (four vehicles) and 63 feet (three vehicles) during the m.d. and p.m. peak hours, respectively.

Parking Evaluation

The report includes the parking requirements for a restaurant one space for every two employees, plus one space for every two customers allowed under maximum capacity (including waiting areas) following the City ordinance. This calculates to 48 spaces. The development is proposing 42 parking spaces, which is a deficit of 6 spaces per the City's zoning ordinance. The report also anticipated parking demand calculated using the methodologies presented in the ITE Parking Generation Manual, 5th Edition resulting in a peak parking demand of 38 parking spaces.

We do not agree with the TIS preparer's conclusion for the parking evaluation suggesting a peak parking demand of 38 spaces. The study has not considered the peak parking demand for Friday which is 51 spaces per ITE 5th Edition.

In accordance with the City zoning ordinance, the parking requirements for a restaurant are one space for every two employees, plus one space for every two customers allowed under maximum capacity (including waiting areas). This calculates to 48 spaces. The development is proposing 48 parking spaces, which meets the City's zoning ordinance.

CONCLUSIONS

1. The study concluded with excessive delay (LOS F) at Karevich Drive/Site driveway. However, the 95th percentile queues for the SB approach of the Oaks Drive South and Karevich Drive/Site Driveway intersection are 96 feet (four vehicles) and 63 feet (three vehicles) during the m.d. and p.m. peak hours, respectively.

Response: Analysis of the LOS results for future conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the m.d. and p.m. peak hours, with the following exceptions at Oaks Drive South and Karevich Drive/Site Driveway:

- **The SB approach operates at LOS F in the m.d. and p.m. peak hours.**

2. The study has not considered the peak parking demand for Friday which is 51 spaces per ITE 5th Edition.

Response: See above response.

City of Novi Fire Department: Kevin S. Pierce, Fire Marshal

IRRIGATION SYSTEM / CONNECTION TO PUBLIC WATER SUPPLY (Dated 6/07/2024)

PSP# 23-055

Project Description:

Build a 4,060 Sq. Ft. structure off West Oaks Dr.

Comments:

- All fire hydrants MUST be installed and operational prior to any combustible material is brought on site. IFC 2015 3312.1
- For new buildings and existing buildings, you MUST comply with the International Fire Code Section 510 for Emergency Radio Coverage. This shall be completed by the time the final inspection of the fire alarm and fire suppression permits.
- Completed 6-3-24 KSP- The minimum width of a posted fire lane is 20 feet. The minimum height of a posted fire lane is 14 feet. (D.C.S Sec. 158-99(a).)
- Completed 6-3-24 KSP- Fire apparatus access drives to and from buildings through parking lots shall have a minimum fifty (50) feet outside turning radius and designed to support a minimum of thirty-five (35) tons. (D.C.S. Sec 11-239(b)(5))
- RECEIVED 12/22/23 - A hazardous chemical survey is required to be submitted to the Planning & Community Development Department for distribution to the Fire Department at the time any Preliminary Site Plan is submitted for review and approval. Definitions of chemical types can be obtained from the Fire Department at (248) 735-5674.
- COMPLETED 12/22/23 - Watermains and fire hydrant shall be put on the plans for review.
- Water mains greater than 25', shall be at least 8" in diameter. Shall be put on plans for review. (D.S.C. Sec.11-68(C)(1)(c))

City of Novi Department of Public Services Water & Sewer Division:

Linda Slepetski, Water & Sewer Division

IRRIGATION SYSTEM / CONNECTION TO PUBLIC WATER SUPPLY (Dated 6/07/2024)

Project Name: Culver's W. Oaks Dr at Novi Rd

Drawings and Revision Dates Reviewed:

- Revision date: 5/09/2024
- List of Drawings: IR-1, IR-3

Plan Review: **Not Approved**

**** For all irrigation plan comments see the revised irrigation plans IR-1 through IR-3.**

Point of Connection [POC] Identified: **Yes, 1 ½" line tapped from domestic water supply. Please clarify the notation on plans means before building containment RPZ. Irrigation to have own RPZ.**

Expansion of existing irrigation system or new system: **New**

RPZ's must be installed as the required protective assembly unless circumstances warrant the installation of a Pressure Vacuum Breaker (PVB) assembly for protection of the public water supply. PVB's must have specific approval from the Water & Sewer Cross Connection Specialist or Water & Sewer Manager for such installations and such approval with conditions of approval documented on the drawings.

Comments: Febco 1 ½" 825Y RPZ in legend on IR-1

Backflow preventer attached to building or common area: [Building](#)

Backflow preventer riser diagram provided: Yes

Comments: IR-3

Detail provided showing installation meets manufacturer winterization requirements per city handout:

Yes

Comments: IR-1 reference notes 3.

The following notation provided: **No**

Required RPZ must be ASSE 1013 listed as a complete assembly including shutoff valves. Assembly required to be installed by a licensed plumbing contractor. Plumbing permit is required. New assembly must be tested after installation by a licensed plumber also ASSE 5110 Certified to test. Results must be recorded on the City of Novi test report form with a copy sent to the Novi Water & Sewer Division. RPZ must be installed not less than 12-inches above FINISHED GRADE measured from the bottom of the pressure relieve valve. Assemblies must be in compliance with the Michigan Plumbing Code, manufacturer installation instructions including winterization and ASSE listing approvals for orientation, valves, etc

City of Novi Department of Public Services Water & Sewer Division: Dated 06/07/2024

Kevin Roby, Cross Connection Specialist

Pursuant to the Safe Drinking Water Act, P.A. 399, Part 14 Rules (Rule 1406) and the City of Novi Cross

Connection Control Program (CCCP) please be advised of the following requirements.

The Water and Sewer Division is requiring an ASSE 1013 listed and approved Reduced Pressure Zone Assembly (RPZ) to be installed immediately downstream of the water meter in addition to the below requirements.

- The assembly shall be provided in an accessible location with access through a swing door if installed in an enclosed location.
- Access shall be approved by the Water & Sewer Division.
- A floor drain shall be provided in accordance with the Michigan Plumbing Code or Michigan Residential Code and approved by the Community Development Department Plumbing Division.
- Thermal Expansion requirements must be considered in accordance with the Michigan Plumbing Code or Michigan Residential Code and approved by the Community Development Department Plumbing Division.
- If a booster pump is necessary, low pressure cutoff requirements must be addressed in accordance with the Michigan Plumbing Code



Sincerely,
KIMLEY-HORN OF MICHIGAN, INC.

A handwritten signature in black ink that reads "Tyler Smith".

Tyler Smith, P.E.
Project Manager

CC: Charles Paisley
Mike Sabrosky



PLANNING COMMISSION MINUTES

CITY OF NOVI
Regular Meeting
June 26, 2024 7:00 PM

Council Chambers | Novi Civic Center
45175 Ten Mile Road, Novi, MI 48375 (248) 347-0475

CALL TO ORDER

The meeting was called to order at 7:00 PM.

ROLL CALL

Present: Member Avdoulos, Member Becker, Member Lynch, Chair Pehrson, Member Roney, Member Verma

Absent Excused: Member Dismondy

Staff: Barb McBeth, City Planner; Beth Saarela, City Attorney; Lindsay Bell, Senior Planner; James Hill, Planner; Heather Ziegler, Planner; Humna Anjum, Plan Review Engineer; Rick Meader, Landscape Architect

PLEDGE OF ALLEGIANCE

Member Becker led the meeting attendees in the recitation of the Pledge of Allegiance.

APPROVAL OF AGENDA

Motion made by Member Lynch and seconded by Member Avdoulos to approve the June 26, 2024 Planning Commission Agenda.

VOICE VOTE ON MOTION TO APPROVE THE JUNE 26, 2024 PLANNING COMMISSION AGENDA MOVED BY MEMBER LYNCH AND SECONDED BY MEMBER AVDOULOS. Motion carried 6-0.

AUDIENCE PARTICIPATION

Chair Pehrson invited members of the audience who wished to address the Planning Commission during the first audience participation to come forward. Seeing no one, Chair Pehrson closed the first public audience participation.

CORRESPONDENCE

There was not any correspondence.

COMMITTEE REPORTS

There were no Committee reports.

CITY PLANNER REPORT

There was not a City Planner report.

CONSENT AGENDA - REMOVALS AND APPROVALS

There were no Consent Agenda Removals and Approvals items.

PUBLIC HEARINGS

1. **PICKLEBALL NOVI JSP23-15**

Public Hearing at the request of Pickleball Novi for JSP23-15 for Preliminary Site Plan, Special Land Use Permit, Woodland Permit, and Stormwater Management Plan. The subject property is approximately 3.65 acres and is located north of Nine Mile Road on the east side of Venture Drive

ROLL CALL VOTE ON MOTION TO RECOMMEND TO CITY COUNCIL THE REVISED STORMWATER MANAGEMENT PLAN FOR JSP18-10 THE BOND MADE BY MEMBER AVDOULOS AND SECONDED BY MEMBER LYNCH. *Motion carried 6-0.*

Motion to recommend approval to City Council the Woodland Permit for JSP18-10 The Bond moved by Member Avdoulos and seconded by Member Lynch.

In the matter of The Bond JSP18-10, motion to recommend approval to City Council of the Woodland Permit based on and subject to the following findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan. This motion is made because the plan is otherwise in compliance with Chapter 37 of the Code of Ordinances and all other applicable provisions of the Ordinance.

ROLL CALL VOTE ON MOTION TO RECOMMEND TO CITY COUNCIL THE WOODLAND PERMIT FOR JSP18-10 THE BOND MADE BY MEMBER AVDOULOS AND SECONDED BY MEMBER LYNCH. *Motion carried 6-0.*

4. CULVER'S JSP23-37

Public Hearing at the request of Union Pacific Holdings for recommendation to the City Council for Preliminary Site Plan with a PD-2 Option, Special Land Use, and Stormwater Management Plan approval. The subject property is located at the northwest corner of Novi Road and West Oaks Drive in Section 15 and totals approximately 1.69 acres. The applicant is proposing to develop a 4,160 square foot Culver's restaurant with a drive-thru. The applicant is proposing to vacate and move a portion of Karevich Drive so that it traverses through the site.

Planner James Hill relayed this is the continuation of a public hearing previously held at the March 20 Planning Commission meeting. The applicant has returned with a revised site plan and traffic study that has the preliminary approval from all reviewers. The Preliminary Site Plan, Special Land Use with a PD-2 Option, and Stormwater Management plan for a Culver's restaurant, located at the northwest corner of Novi Road and West Oaks Access Drive, is in section 15 of the City. The applicant is proposing a 4,160 square foot restaurant with two drive thru order boards, an outdoor seating area, and associated parking. The site is currently bisected by a portion of North Karevich Drive. As part of the project, the applicant is requesting that the City vacates all of North Karevich Drive so that the applicant can reroute the road through parking lot of the site. The applicant would then take over the responsibility of maintaining the road but allow public access to continue. The street vacation is another matter that the City Council will consider concurrently with the site plan.

Due to the fact that the site lies within the PD-2 District, the Planning Commission does not approve the Preliminary Site Plan, but instead makes a recommendation to the City Council for approval or denial. The City Council then makes the ultimate decision on the matter, in addition to any requested waivers or variances.

As noted, the site is currently bisected by a portion of North Karevich Drive. If the street vacation and lot combination are completed successfully, the site will total approximately 1.69 acres.

The site is currently zoned RC Regional Commercial, and all adjacent property is likewise zoned for RC Regional Commercial. The uses nearby include the West Oaks Shopping Center to the south, including a Carrabba's. Gjeto's Salon is located to the west, Value City Furniture to the north, and Twelve Oaks Mall to the east across Novi Road.

The Future Land Use contemplates Town Center Gateway with a PD-2 Overlay. The PD-2 Overlay also covers the parcels to the west and north of the site, except that their underlying zoning is Town Center Commercial. To the south and east the Future Land Use contemplates Regional Commercial.

Since the site plan for Culver's came before the Planning Commission in late March, there have been a couple notable changes for greater compliance with the Zoning Ordinance. Firstly, instead of rerouting North Karevich Drive around the parking lot, it is now proposed to be routed through the parking lot, with

traffic maintained in both directions and parking for the restaurant on either side. Public access will need to be maintained so that the general public can access sites to the north of this site, and the motion sheet contains language that conditions the approval subject to City Council accepting the street vacation with the appropriate agreements in place. As part of this reroute, the western entrance into the site now has a deficient turning radius of 6.3', with the minimum requirement being 15'. To ameliorate this, the applicant has proposed a mountable concrete median, which is meant to ensure that delivery trucks or fire trucks are able to access the site safely. This will require a deviation from the City Council, and the approval of the site plan will be subject to that deviation being granted. Routing North Karevich Drive through the site has provided additional space onsite so that the bypass lane around the drive-thru is now wide enough to meet City standards. Additionally, no parking setback deviations are required.

The applicant has also provided an updated Traffic Study that provides the correct number of parking spaces and has been approved by the City's Traffic Consultant. As with the former proposal, a sidewalk is proposed on the west side of Novi Road along the site and along North Karevich Drive.

The PD-2 Option permits the restaurant use as a Special Land Use and provides for specific factors that the Planning Commission should consider in the review of the site plan. Namely, meeting the intent of the Special Land Use provisions, providing a Community Impact Statement and Traffic Study, and showing harmony and compatibility with adjacent sites and buildings.

As with other Special Land Use approvals that have come before the Planning Commission, site plans seeking Special Land Use permits need to be considered relative to other feasible uses of the site with the following factors in mind:

- Impact on existing thoroughfares, off-street parking, and travel times
- Impact on the capabilities of public service, including water service, sanitary sewer service, and stormwater disposal
- Impact on natural features such as woodlands and wetlands
- Compatibility with the adjacent property and uses
- Consistency with the goals and intent of the City's Master Plan

Approval of the Preliminary Site Plan will be subject to the City Council granting the requested waivers for the current site layout. Firstly, the PD-2 Option provides use conditions for free-standing restaurant uses. These include a minimum parcel size of 1.25 acres, which the site satisfies. It also requests that the site plan design shall achieve traffic circulation features that assure safety and convenience of both vehicular and pedestrian traffic. The applicant has addressed initial concerns from both Planning, Traffic, and Fire reviews by expanding the bypass lane around the drive-thru. Additionally, the applicant has committed to making future minor revisions to improve the parking layout. The site plan will require a deviation from the Code of Ordinances for a deficiency in driveway turning radii where the mountable concrete median is being proposed. Finally, under the PD-2 option, free-standing restaurants shall be located no closer than 1,000 feet from any other such use on the same side of the street. The proposed Culver's will be less than 1,000 feet from the Carabba's to the south, which will require a deviation from the City Council.

The stormwater management plan for the site is to connect to the greater regional detention system as part of the West Oaks regional detention basin. A pre-treatment structure is proposed prior to storm water leaving the site.

Other site plan related waivers include the dumpster location in the exterior side yard, which is unavoidable due to the site not having a rear yard available for the dumpster to be located in. Landscape waivers include the lack of a berm or wall along both Novi Road and West Oaks Drive, which is supported by staff as a hedge is being provided as screening, for a deficiency in perimeter depth between the west drive and the west property line due to the need to maintain the site entrance location, and a deficiency in sub canopy trees along West Oaks Drive which is supported by staff.

Additionally, a Section 9 façade waiver is required for the underage of brick and overage of composite siding, which is supported by the City's façade consultant. The combined percentage of brick and stone meets the intent of the ordinance with respect to the minimum amount of masonry and the comparatively small overage of composite siding enhances the design of the north elevation.

The Traffic Impact Study indicates that there is a level of service with an F grade for the southbound Karevich drive intersection with West Oaks Drive. The City's Traffic Consultant has acknowledged this level of service but still recommends approval due to the amount of space available on the southbound drive exiting the site for cars to queue.

The Planning Commission is asked tonight to resume the public hearing for JSP23-37 Culver's and recommend approval or denial to the City Council for the Preliminary Site Plan, Special Land Use with a PD-2 Option, and Stormwater Management Plan. The applicant's engineer is in attendance and available for questions, in addition to staff being available.

Chair Pehrson invited the applicant to address the Planning Commission.

Tyler Smith, from Kimley-Horn of Michigan, introduced himself along with his manager Scott Wilson, Mike Sobrowski the general contractor, and Charles Paisley, the owner and operator of Culver's. Mr. Smith relayed that when they were before the Planning Commission a couple of months ago, they weren't prepared so went back to the drawing board to try to come up with something much better that all could agree on.

As Planner Hill mentioned, this is a vacant site with a drive that bisects it into two different parcels, mostly grass with some trees on it. The applicant is proposing to split and combine the parcels with a vacate of Karevich Drive.

Mr. Smith showed the prior layout, which was less efficient for the routing of the road and parking, and into a lot of the front and side yard setbacks. The new layout meets the front yard setbacks along West Oaks Drive and Novi Road, and there is generally a lot more green space and a more efficient layout.

As part of the project there is a sidewalk extension that goes along Novi Road on the west side, as well as including the maintenance of North Karevich Drive and maintaining access to the existing owners. There will also be a 2-inch mill and overlay on Karevich Drive to keep it looking nice and continue to for a long time.

There are a couple of benches proposed with some landscaping, as well as a monument sign along the north side by West Oaks Two Drive to promote people to use that route to get to the site as well, to encourage better traffic flow.

Chair Pehrson opened the Public Hearing and invited members of the audience who wished to participate to approach the podium. Seeing no one, and confirming there was no correspondence, Chair Pehrson closed the Public Hearing and turned the matter over to the Planning Commission.

Member Lynch referenced issues with the traffic flow at Chick-fil-A and stated as long as the traffic consultant is in agreement here, he is in support.

Member Becker referenced the requirement that a restaurant cannot be closer than 1,000 feet to another restaurant in the TC district. He does not see Culver's competing the Carraba's or Starbucks, as they are entirely different destinations. If that is the requirement, then we'll hope to get that approved.

Member Verma stated that the design looks beautiful, very spacious.

Member Roney stated that when the applicant was last before the Planning Commission, he inquired if they were able to speak with Value City about the road. Mr. Smith responded that so far, they have not been responsive, but they are included in the draft terms for full unrestricted access regardless of their feedback.

Member Avdoulos stated that he was hoping there would be samples from Culver's. He is in favor of the proposal, his main concern is traffic making a left turn off Karevich Drive onto West Oaks Drive. It is a bad intersection. With Chick-fil-A, there was a lot of concern with traffic and that settled down after the initial

response to the opening.

Motion to recommend approval to City Council JSP23-37 Culver's for Special Land Use made by Member Avdoulos and seconded by Member Becker.

Chair Pehrson inquired if there has been consideration relative to signage in terms of entering Karevich Drive. City Planner McBeth responded that access would be very similar to how it has always been. Chair Pehrson suggested that initially people may be confused so he'd like to see some thought on added signage.

In the matter of the request of Union Pacific Holdings for Culver's JSP23-37, motion to recommend approval to the City Council for Special Land Use based on and subject to the following:

1. The proposed use will not cause any detrimental impact on existing thoroughfares based on the Traffic review.
2. The proposed use will not cause any detrimental impact on the capabilities of public services and facilities based on the Engineering review.
3. The proposed use is compatible with the natural features and characteristics of the land because there are no regulated natural features on site.
4. The proposed use is compatible with adjacent uses of land because the proposed use is similar to other nearby restaurants with a drive-thru.
5. The proposed use is consistent with the goals, objectives, and recommendations of the City's Master Plan for Land Use as it fulfills one of the Master Plan objectives to attract new businesses within City of Novi.
6. The proposed use will promote the use of land in a socially and economically desirable manner as it fulfills one of the Master Plan objectives to attract new businesses within City of Novi.
7. The proposed use is (1) listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and (2) is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located.
8. The City Council's determination to vacate North Karevich Drive and that the appropriate agreements are put in place to maintain access to the property to the north.
9. Subject to further review as the project moves forward of providing wayfinding signage along the vacated portion of North Karevich Drive to ensure that adequate notice is provided to the businesses in the area.
10. Add signage and wayfinding for Karevich Drive.

This motion is made because the plan is otherwise in compliance with Article 3, Article 4, Article 5, and Article 6 of the Zoning Ordinance and all other applicable provisions of the Ordinance.

ROLL CALL VOTE ON MOTION TO RECOMMEND APPROVAL TO CITY COUNCIL JSP23-37 CULVER'S FOR SPECIAL LAND USE MOVED BY MEMBER AVDOULOS AND SECONDED BY MEMBER BECKER. *Motion carried 6-0.*

Motion to recommend approval to City Council JSP23-37 Culver's for Preliminary Site Plan with a PD-2 Option made by Member Avdoulos and seconded by Member Lynch.

In the matter of the request of Union Pacific Holdings for Culver's JSP23-37, motion to recommend approval to the City Council for Preliminary Site Plan with a PD-2 Option based on and subject to the following:

1. Planning Commission findings that the standards of Section 3.31.4 of the Zoning Ordinance are adequately addressed, as identified in the Planning Review Letter.
2. The recommendation includes the following ordinance deviations for consideration by the City Council:
 - i. Deviation from Section 3.31.7.B.v.a, the use conditions for fast food drive-thru under PD-2 Option as listed that requires a minimum distance of 1,000 feet between a proposed independently freestanding restaurant from any other such use on the same side of the street. The proposed restaurant is less than 1,000 feet from the

- Carabba's to the south.
- ii. Deviation from Section 4.19.2.F for allowing a dumpster in the exterior side yard instead of required rear yard.
- iii. Landscape deviation from Section 5.5.3.B.ii and iii for lack of berm or wall along both Novi Road and West Oaks Drive.
- iv. Landscape deviation from Section 5.5.3.B.ii and iii for deficient perimeter depth between the west drive and the west property line
- v. Deviation from Section 11-216 of the Code of Ordinances, Design Considerations, for the deficient driveway turning radius where the mountable concrete median is proposed.
- vi. Section 9 Façade waiver for underage of brick and overage of composite siding.
- 3. The City Council's determination to vacate North Karevich Drive and that the appropriate agreements are put in place to maintain access to the property to the north.
- 4. The findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan.

This motion is made because the plan is otherwise in compliance with Article 3, Article 4, and Article 5 of the Zoning Ordinance and all other applicable provisions of the Ordinance.

ROLL CALL VOTE ON MOTION TO RECOMMEND APPROVAL TO CITY COUNCIL JSP23-37 CULVER'S FOR PRELIMINARY SITE PLAN WITH A PD-2 OPTION MOVED BY MEMBER AVDOULOS AND SECONDED BY MEMBER LYNCH. *Motion carried 6-0.*

Motion to recommend approval to City Council JSP23-37 Culver's for Stormwater Management Plan made by Member Avdoulos and seconded by Member Becker.

In the matter of the request of Union Pacific Holdings for Culver's JSP23-37, motion to recommend approval to the City Council for Stormwater Management Plan based on and subject to the following findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan. This motion is made because it is otherwise in compliance with Chapter 11 of the Code of Ordinances and all other applicable provisions of the Ordinance.

ROLL CALL VOTE ON MOTION TO RECOMMEND APPROVAL TO CITY COUNCIL JSP23-37 CULVER'S FOR STORMWATER MANAGEMENT PLAN MOVED BY MEMBER AVDOULOS AND SECONDED BY MEMBER BECKER. *Motion carried 6-0.*

5. 30551 NOVI ROAD WOODLAND PERMIT PBR23-0427

Public Hearing at the request of Ayad Kashat, for a Woodland Use Permit for 30551 Novi Road. The site is located west of Novi Road, and north of Thirteen Mile Road in Section 3 of the City. The applicant is requesting the removal of eighty-four (84) regulated woodland trees to build a single-family home.

Planner Heather Zeigler stated that the applicant Ayad Kashat is seeking approval of a Woodland Use Permit to remove 84 regulated woodland trees, ranging in size from 8 to 29 inches diameter at breast height from a lot located at 30551 Novi Road. The site is located west of Novi Road and north of Thirteen Mile in Section 3 of the City.

The applicant is requesting the removal of 84 regulated woodland trees to build a single-family home. The location is zoned R-4, adjacent to RA Residential Acreage. The Future Land Use map indicates single family residential and the existing wetlands and woodlands on site are to be impacted.

The City Woodland consultant reviewed the request and prepared a review letter dated May 3rd, 2024. Based on the plans provided, the applicant is proposing to remove 84 regulated woodland trees in an area mapped as City regulated woodland. Replacement calculations require 166 replacement credits, 39 are proposed to be replaced and the remainder is to be paid into the tree fund. The Woodland

TRAFFIC IMPACT STUDY

Culver's of Novi Traffic Impact Study

Union Pacific Holdings, LLC

Project No. 231767

May 13, 2024

REVISION 1

Culver's of Novi Traffic Impact Study

**Prepared For:
Union Pacific Holdings, LLC
Wixom, MI**

**May 13, 2024
Project No. 231767**

Revision 1

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List of Abbreviations/Acronyms

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
City	City of Novi
EB	eastbound
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LUC	Land Use Code
m.d.	mid-day
MDOT	Michigan Department of Transportation
mph	miles per hour
NB	northbound
RCOC	Road Commission for Oakland County
SB	southbound
SCATS	Sydney Coordinated Adaptive Traffic System
sft	square foot
TIS	Traffic Impact Study
TMC	Turning Movement Count
WB	westbound
vpd	vehicles per day

References

- Institute of Transportation Engineers, 2021, *Trip Generation Manual*, 11th Edition.
- Michigan Department of Transportation, 2021, *Electronic Traffic Control Device Guidelines*.
- Michigan Department of Transportation, 2017, *Geometric Design Guidance*.
- Michigan Department of Transportation, 2013, *Michigan Manual on Uniform Traffic Control Devices*.
- Transportation Research Board, 2016, *Highway Capacity Manual*, 6th Edition.

Executive Summary

Fishbeck has conducted a traffic impact study (TIS) related to the proposed development located in the northwest corner of the intersection of Novi Road and West Oaks Drive/Twelve Oaks Mall Road in the City of Novi (City), Oakland County, Michigan. Existing land use is vacant with Karevich Drive crossing through the site. The proposed development consists of a 4,106 square foot (sft) Culver's fast-food restaurant with a drive-through window and realignment of Karevich Drive. Access to the proposed site will be provided via one proposed driveway on West Oaks Drive and access to Karevich Drive. The development is assumed to be open and fully operational in 2024.

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Michigan Department of Transportation (MDOT), Road Commission for Oakland County (RCOC), and the City.

Vehicular turning movement counts (TMCs) were collected at the study intersections during the weekday mid-day (m.d.) (11 a.m. to 1 p.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the road network on Thursday, January 25, 2024.

Site-generated traffic was forecast using the information and methodologies specified in the *Trip Generation Manual*. Existing traffic volumes, site layout, and engineering judgement were used to develop a trip distribution model for the m.d. and p.m. peak hours for the new traffic that would be generated by the proposed development.

A portion of the site-generated trips are anticipated to be pass-by in nature, meaning they already exist on the adjacent road network and are interrupted to visit the site.

Operational analyses were conducted for existing and total future conditions based on the *Highway Capacity Manual* (HCM) 6th Edition methodologies using Synchro traffic analysis software. Synchro network models were also simulated using SimTraffic to evaluate network operations including intersection queueing.

Based on the findings of the HCM operational analyses and site traffic generation, no improvements are recommended to mitigate traffic impacts.

The opinions, findings, and conclusions expressed in this TIS are those of Fishbeck and not necessarily those of the Owner/Applicant, MDOT, RCOC, or the City.

Prepared By:



Jill Bauer, PE, PTOE

Project Manager – Fishbeck

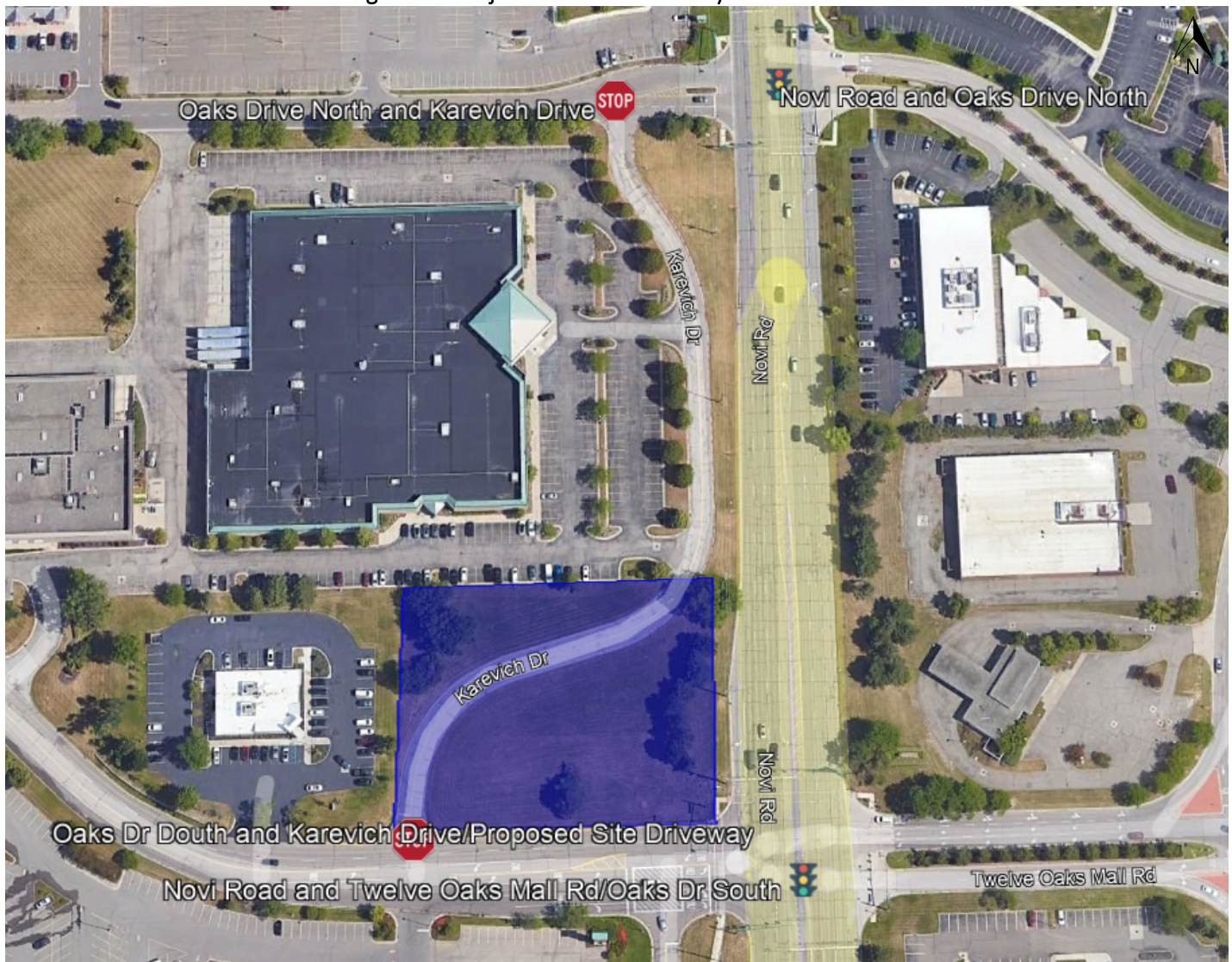
1.0 Introduction

1.1 Project Overview

On behalf of Union Pacific Holdings, LLC, Fishbeck has conducted a TIS related to the proposed development located in the northwest corner of the intersection of Novi Road and West Oaks Drive/Twelve Oaks Mall Road in the City, Oakland County, Michigan. Existing land use is vacant with Karevich Drive crossing through the site. The proposed development consists of a 4,106 sft Culver's fast-food restaurant with a drive-through window and realignment of Karevich Drive. Access to the proposed site will be provided via one proposed driveway on West Oaks Drive and access to Karevich Drive. The development is assumed to be open and fully operational in 2024.

The project location and study intersections are displayed in Figure 1.

Figure 1 – Project Location and Study Network



1.2 Study Methodology

The objectives of this TIS were to determine what impacts the proposed project traffic would have on adjacent roadway traffic operations, and to develop recommendations for any improvements necessary to mitigate the traffic impacts on the studied intersections. Study analyses were completed relative to typical weekday m.d. and p.m. peak periods.

This study was conducted according to the methodologies and guidance published by ITE, AASHTO, MDOT, RCOC, and the City.

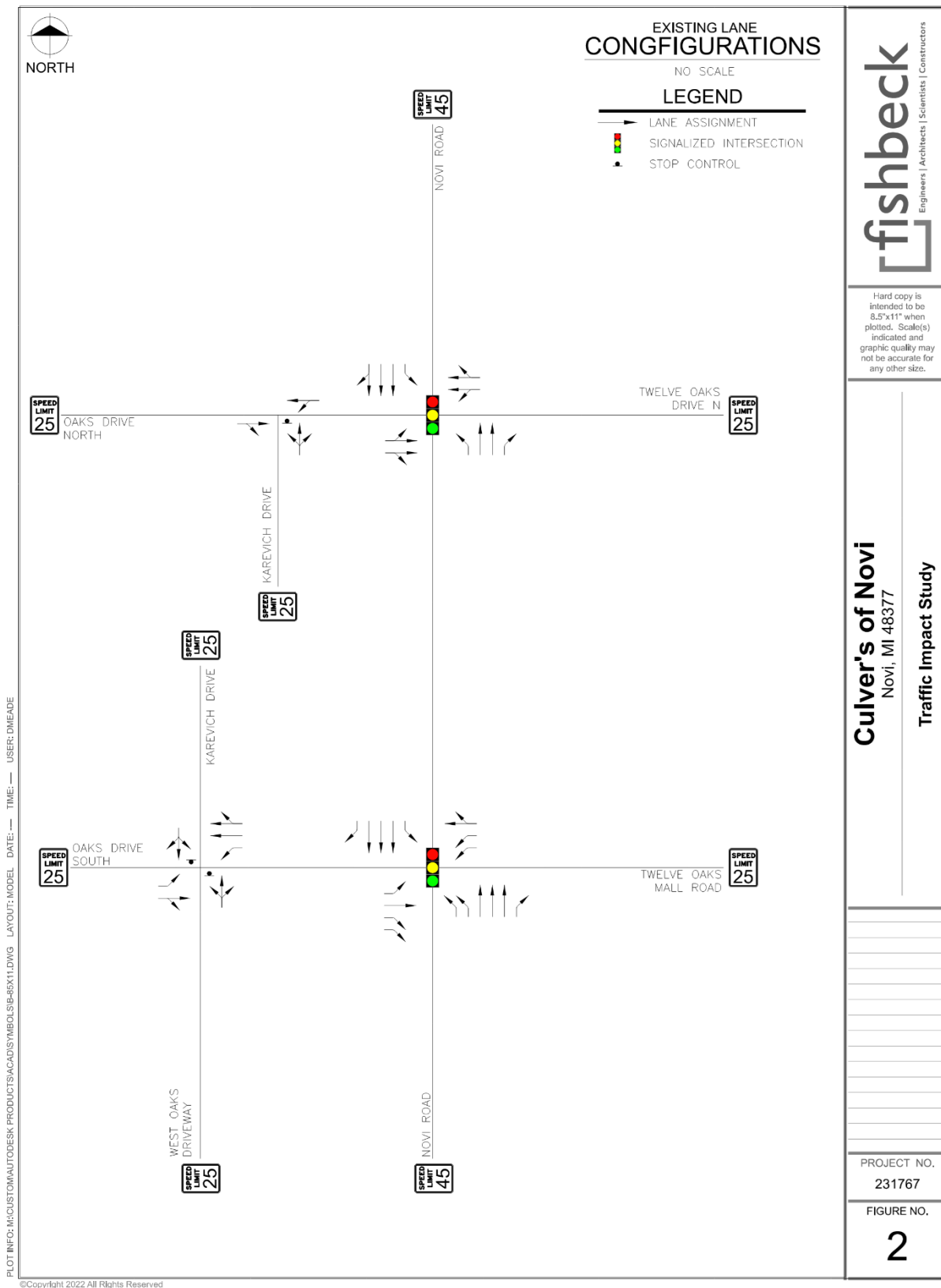
1.3 Intersection Characteristics

Based on the type and size of the proposed development and the area of influence for the site trips, traffic operations were analyzed for the following intersections:

- Novi Road and Twelve Oaks Mall Road/Oaks Drive South (signalized).
- Novi Road and Oaks Drive North (signalized).
- Oaks Drive South and Karevich Drive/Proposed Site Driveway (unsignalized).
- Oaks Drive North and Karevich Drive (unsignalized).

The existing intersection lane configurations, traffic controls, and posted speed limits are displayed in Figure 2.

Figure 2 – 2024 Existing Lane Configurations



1.4 Roadway Characteristics

The characteristics of the study area roadways and signalized intersections are described in Tables 1 and 2. The data points referenced were from the Southeast Michigan Council of Governments Traffic Count Database System online maps.

Table 1 – Roadway Characteristics

Roadway	Jurisdiction	Speed Limit (mph)	No. of Lanes	Roadway Classification	Direction	AADT (vpd)
Novi Road	RCOC	45	7-9	Principal Arterial	NB	16,358
					SB	8,847
Karevich Drive	City of Novi	Not Posted	2	Local	NB	Not Available
					SB	Not Available
Oaks Drive North	Private	Not Posted	2-4	Uncertified	EB	2,254
					WB	1,822
Oaks Drive South	City of Novi	30	4-7	Local	EB	6,198
					WB	4,294

AADT Average Annual Daily Traffic
 mph miles per hour
 vpd vehicles per day

Table 2 – Signal Characteristics

Intersection	Jurisdiction	Left Turn Phasing			
		NB	SB	EB	WB
Novi Road and Twelve Oaks Mall Road/Oaks Drive South	RCOC	Protected	Protected	Protected	Protected
Novi Road and Oaks Drive North	RCOC	Permitted and Protected	Permitted and Protected	Protected	Protected

EB eastbound
 NB northbound
 SB southbound
 WB westbound

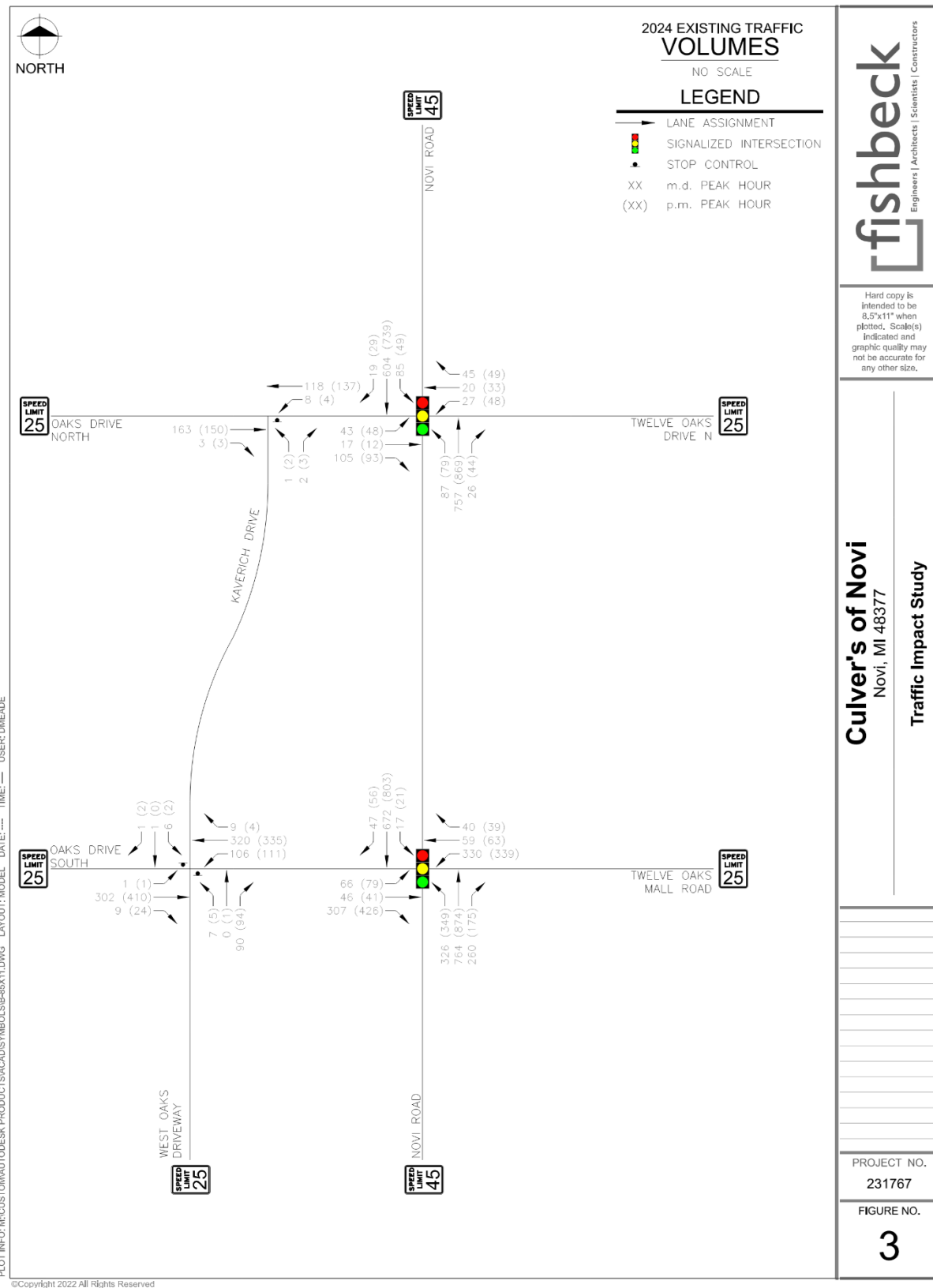
1.5 Existing Traffic Volumes

Vehicular TMCs were collected at the following study intersections during the weekday m.d. (11 a.m. to 1 p.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the road network on Thursday, January 25, 2024:

- Novi Road and Twelve Oaks Mall Road/Oaks Drive South
- Novi Road and Oaks Drive North
- Oaks Drive South and Karevich Drive/Proposed Site Driveway
- Oaks Drive North and Karevich Drive

Traffic volume information can be found in Appendix 1, which includes heavy vehicle data. The existing traffic volumes used in this study are provided in Figure 3.

Figure 3 – 2024 Existing Traffic Volumes



2.0 2024 Existing Conditions Analysis

2.1 Traffic Operations Analysis Methodology

Synchro was used to perform HCM operational analyses during the m.d. and p.m. peak hours for all intersections within this study. According to the most recent editions of the HCM, Level of Service (LOS) is a qualitative measure describing operational conditions of a traffic stream or intersection. LOS ranges from A to F, with LOS A representing desirable traffic operations characterized by low delay and LOS F representing extremely poor traffic operations characterized by excessive delays and long vehicle queues. LOS D is considered acceptable for most areas. Table 3 presents the HCM criteria for various LOSs for unsignalized and signalized intersections. The color coding in the table is used in the operational analysis summary tables later in this report.

Table 3 – LOS Criteria

LOS	Average Stopped Vehicle Delay (seconds)	
	Unsignalized	Signalized
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

2.2 Existing Conditions Traffic Analysis

Synchro models for the existing network were created based on the existing roadway configurations and traffic controls. The traffic signal timing permits for the signalized intersections were provided by RCOC for use in the models. The traffic signals are a part of RCOC’s Sydney Coordinated Adaptive Traffic System (SCATS), meaning the traffic signals will adapt to give more green time to approaches than what may be shown in the traffic signal timing permit. The traffic signal cycle lengths and clearance intervals were maintained based on the traffic signal timing permit; however, the traffic signal timing splits were optimized in Synchro at the intersection of Novi Road and Twelve Oaks Mall Road/Oaks Drive South.

The resulting LOS and delay for the existing conditions are provided in Table 4.

Table 4 – LOS Analysis for Existing Conditions

Approach	LOS/Delay(s)			
	m.d. Peak Hour		p.m. Peak Hour	
Novi Road and Twelve Oaks Mall Road/Oaks Drive South (Signalized)				
EB Oaks Drive South	C	29.5	D	36.2
WB Twelve Oaks Mall Road	D	37.2	D	42.5
NB Novi Road	C	24.2	C	27.6
SB Novi Road	C	28.5	C	22.8
Overall	C	28.1	C	29.9
Novi Road and Oaks Drive North (Signalized)				
EB Oaks Drive North	D	41.5	D	50.0
WB Oaks Drive North	D	39.8	D	49.0
NB Novi Road	B	11.1	A	1.1
SB Novi Road	A	9.9	A	9.6
Overall	B	13.7	A	9.9
Oaks Drive South and Karevich Drive (Stop-Controlled)				
EB Oaks Drive South	A	0.0	A	0.0
WB Oaks Drive South	A	2.0	A	2.2
NB West Oaks Driveway	B	12.3	B	13.6
SB Karevich Drive	D	25.6	C	21.8
Overall	A	2.8	A	2.4
Oaks Drive North and Karevich Drive (Stop-Controlled)				
EB Oaks Drive North	A	0.0	A	0.0
WB Oaks Drive North	A	0.5	A	0.2
NB Karevich Drive	A	9.7	A	9.8
Overall	A	0.3	A	0.3

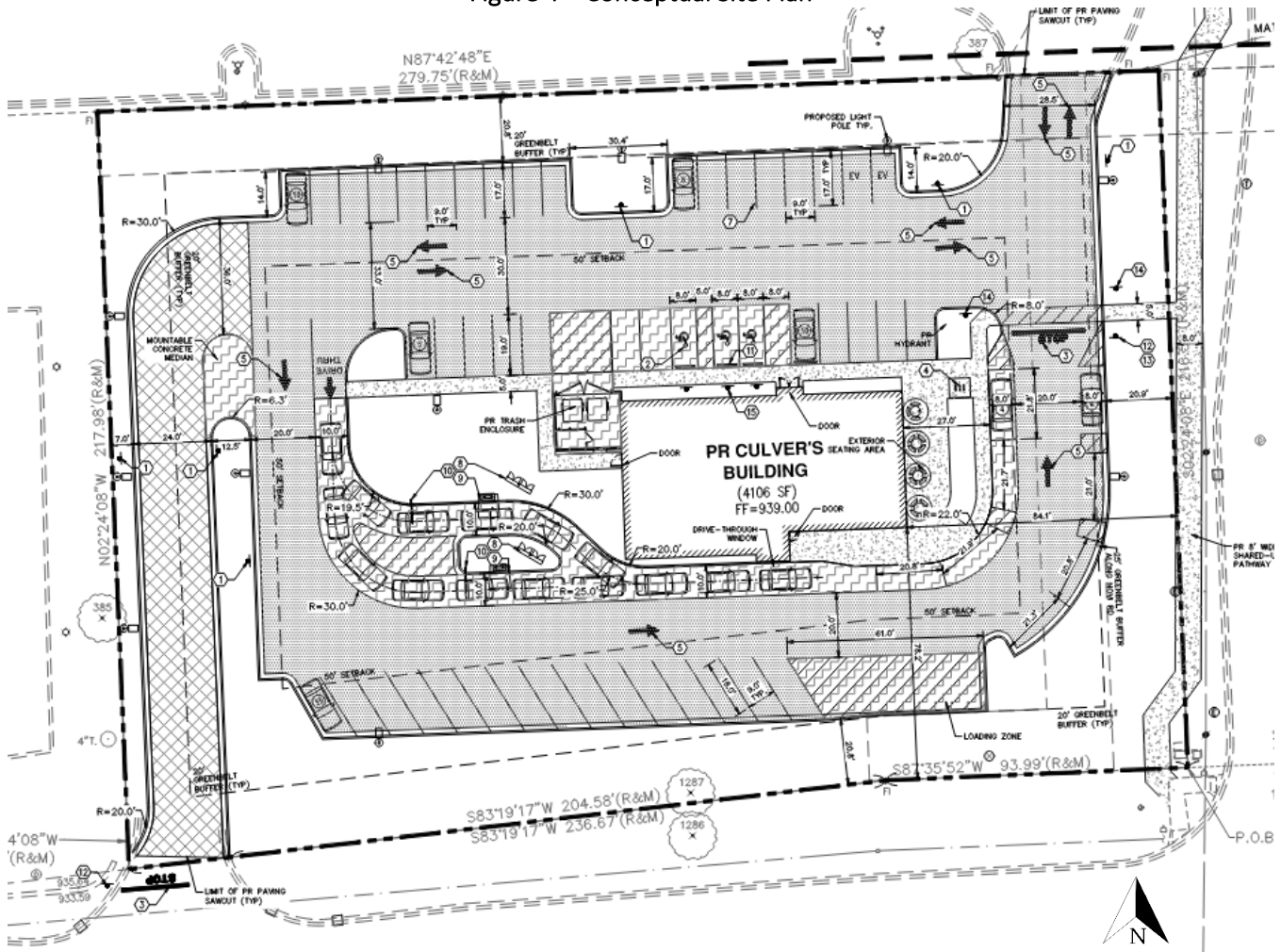
Further analysis of the LOS results for existing conditions revealed that all movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the m.d. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For existing conditions, study network operations are acceptable, with no significant vehicle queues. No 95th percentile queue lengths for the turning movements exceed the provided storage length. See Appendix 2 for the existing conditions LOS reports and queueing analysis reports.

3.0 Site Traffic Characteristics

A representation of the current conceptual site plan is provided in Figure 4.

Figure 4 – Conceptual Site Plan



3.1 Trip Generation

Using the information and methodologies specified in the ITE *Trip Generation Manual*, Fishbeck forecast the weekday m.d. and p.m. peak hour trips associated with the proposed development.

A portion of the site-generated trips are anticipated to be pass-by in nature, meaning they already exist on the adjacent road network and are interrupted to visit the site. According to ITE methodology, new trips are assumed to return to their direction of origin whereas pass-by trips continue in their original direction of travel. The ITE *Trip Generation Manual* was used to calculate what percentage of the trips would be pass-by trips, meaning they are vehicles already on the network that would access the development and are not additional trips added to the network.

Table 5 presents the resulting trip generation for the development. Refer to Appendix 3 for additional information.

Table 5 – Trip Generation for Proposed Development

ITE Land Use	LUC	Units	m.d. Peak Hour			p.m. Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Fast Food Restaurant with Drive Through Window	934	4,106 sft	115	115	230	71	65	136	1,919
Total			115	115	230	71	65	136	
Pass-By Rates, LUC 934: 55% m.d.; 55% p.m.			63	63	126	39	36	75	
Total New Trips			52	52	104	32	29	61	1,919

3.2 Trip Distribution

The directions that site traffic will travel to and from were based upon existing traffic patterns during the m.d. and p.m. peak hours. The existing traffic patterns reflect the gravity between origins and destinations in the study area, and therefore an accurate indication of where the proposed trips would be coming from and going to. Table 6 provides the probable distribution based on existing traffic patterns.

Table 6 – Trip Distribution

Direction	Via	New Trips				Pass-By Trips	
		m.d. Peak Hour		p.m. Peak Hour		m.d. Peak Hour	p.m. Peak Hour
		To	From	To	From		
North	Novi Road	30%	25%	31%	27%	65%	61%
South	Novi Road	44%	46%	48%	43%	35%	39%
East	Twelve Oaks Mall Road	11%	15%	7%	13%		
West	W Oaks Drive	15%	14%	14%	17%		

The trip distribution for the site is indicated in Figure 5. The pass-by volumes are indicated in Figure 6. These trips were added to the existing volumes (Figure 3) to result in the future conditions volumes in Figure 7.

Figure 5 – Trip Generation Volumes

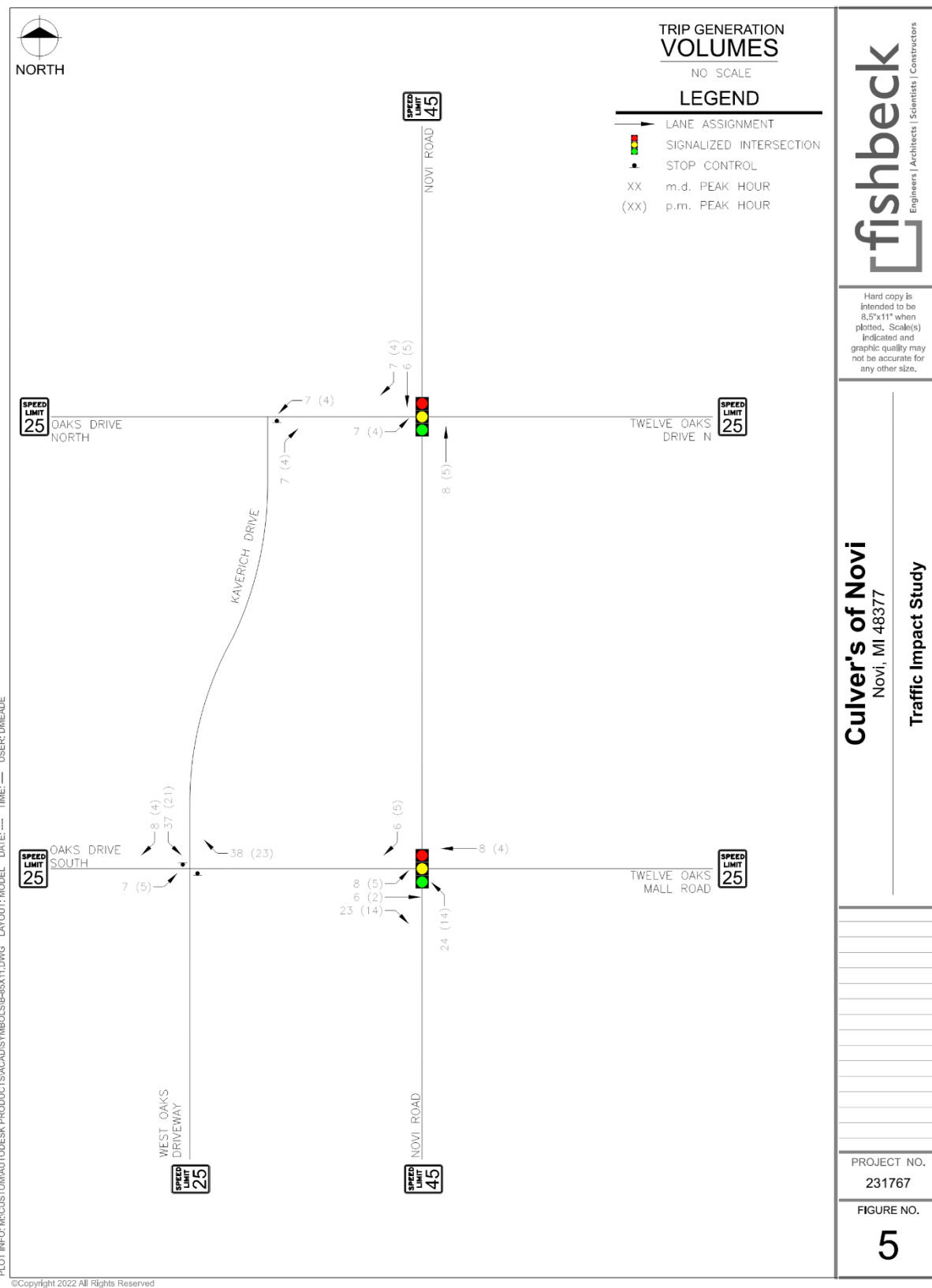


Figure 6 – Pass-By Volumes

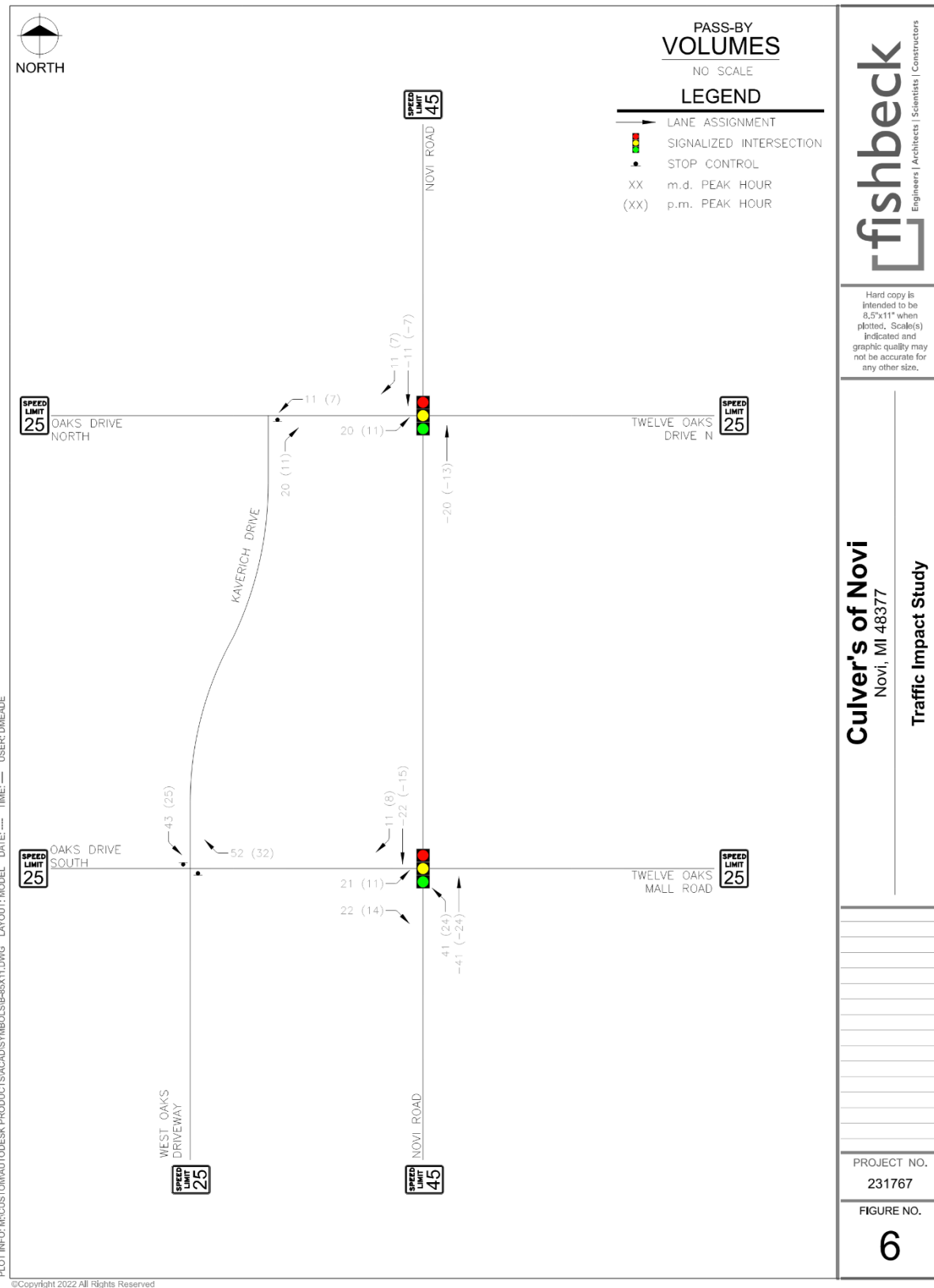
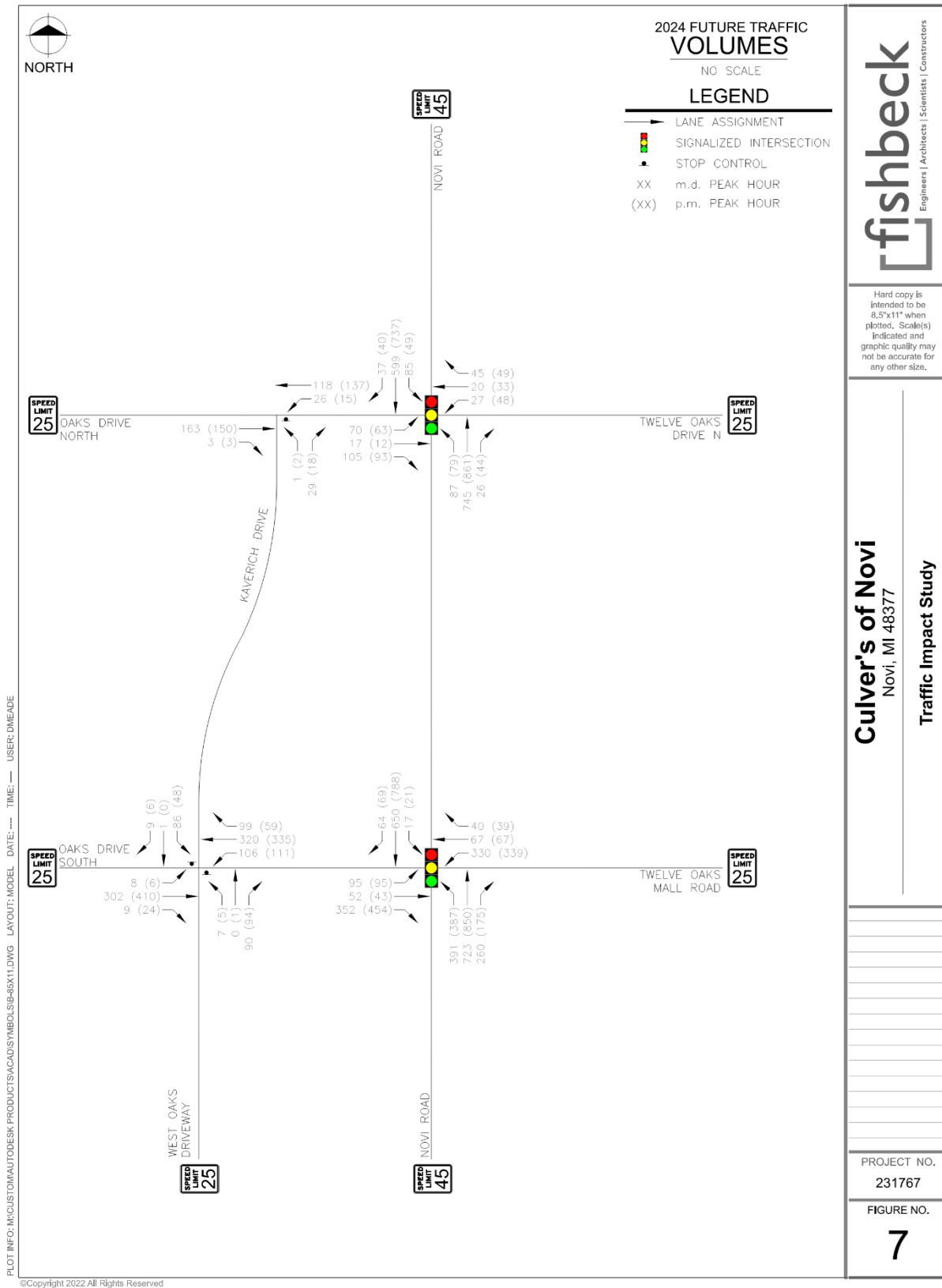


Figure 7 – 2024 Future Traffic Volumes



4.0 2024 Future Conditions Analysis

4.1 Turn Lane Warrants

An evaluation was performed in accordance with City requirements to determine if a right turn deceleration lane was required at the site driveway. A left turn lane for EB traffic already exists at the site driveway so this was not evaluated. The results of the analysis indicated a right turn taper is warranted at the Site Driveway. All turn lane warrant charts are provided in Appendix 4. The results of the analysis are presented in Table 7.

Table 7 – Turn Lane Warrants

Intersection	Movement	Existing Treatment	Result
Oaks Drive South and Karevich Drive/Site Driveway	WB Oaks Drive South	None	Right Turn Taper Warranted

4.2 Future Conditions Traffic Analysis

The resulting LOS and delay for the future conditions are presented in Table 8.

Table 8 – LOS Analysis for Future Conditions

Approach	LOS/Delay(s)			
	m.d. Peak Hour		p.m. Peak Hour	
Novi Road and Twelve Oaks Mall Road/Oaks Drive South (Signalized) ¹				
EB Oaks Drive South	C	28.3	C	33.7
WB Twelve Oaks Mall Road	D	37.1	D	44.3
NB Novi Road	C	25.4	C	28.1
SB Novi Road	C	30.0	C	29.4
Overall	C	28.8	C	31.8
Novi Road and Oaks Drive North (Signalized)				
EB Oaks Drive North	D	41.9	D	49.7
WB Oaks Drive North	D	39.8	D	49.0
NB Novi Road	B	11.2	A	1.1
SB Novi Road	B	10.1	A	9.8
Overall	B	14.3	B	10.3
Oaks Drive South and Karevich Drive/Site Driveway (Stop-Controlled)				
EB Oaks Drive South	A	0.2	A	0.1
WB Oaks Drive South	A	1.7	A	1.9
NB West Oaks Driveway	B	12.4	B	13.7
SB Karevich Drive/Site Driveway	F	137.2	F	79.3
Overall	C	19.8	A	7.8
Oaks Drive North and Karevich Drive (Stop-Controlled)				
EB Oaks Drive North	A	0.0	A	0.0
WB Oaks Drive North	A	1.4	A	0.8
NB Karevich Drive	A	9.5	A	9.5
Overall	A	1.5	A	1.2

¹SCATS traffic signal timing was optimized

Further analysis of the LOS results for future conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the m.d. and p.m. peak hours, with the following exceptions:

- Oaks Drive South and Karevich Drive/Site Driveway:
 - The SB approach operates at LOS F in the m.d. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For future conditions, study network operations are acceptable. The 95th percentile queues for the SB approach of the Oaks Drive South and Karevich Drive/Site Driveway intersection are 96 feet (four vehicles) and 63 feet (three vehicles) during the m.d. and p.m. peak hours, respectively. No mitigation is recommended at this location. See Appendix 5 for the future conditions LOS reports and queueing analysis reports.

4.3 Access Management

An evaluation was performed in accordance with the City code of ordinances to determine if the driveway spacing of the site driveway is adequate on West Oaks Drive.

On a roadway with a speed limit of 25 mph, near approach curb to near approach curb distance between access points should be 105 feet. The proposed driveway location will meet this distance from the driveway to the west. Additionally, keeping the approach in this location will keep it lined up with the driveway to the south.

4.4 Parking Evaluation

An evaluation of the parking related to the proposed development was completed. In accordance with the City zoning ordinance, the parking requirements for a restaurant are one space for every two employees, plus one space for every two customers allowed under maximum capacity (including waiting areas). This calculates to 48 spaces. The development is proposing 48 parking spaces, which meets the City's zoning ordinance.

5.0 Findings and Recommendations

The analyses conducted for this TIS indicate the proposed development will not result in any significant operational impacts to the adjacent road network. The proposed site access configuration is appropriate and will facilitate site ingress and egress. These conclusions are supported by the following key findings:

- Existing storage lengths are adequate for all movements in existing and future conditions.
- Lane configurations and physical capacity are appropriate within the study area.
- The proposed number of parking spaces shown on the site plan are in accordance with the City's zoning ordinance.

Based on the findings of the HCM operational analyses and site traffic generation, no improvements are recommended to mitigate traffic impacts.

Appendix 1

Traffic Volume Data

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#1 - Novi Road & Oaks Drive South/Twelve Oaks Drive	m.d. Peak Hour 01/25/24 12:00 p.m. - 1:00 p.m.		PHF	0.92			0.91			0.93			0.95						
			% Heavy	1%			1%			2%			1%						
		2024	Existing	66	46	307	330	59	40	326	764	260	17	672	47	12	3	116	16
		2024	Existing Adj.	66	46	307	330	59	40	326	764	260	17	672	47				
		2024	Background	66	46	307	330	59	40	326	764	260	17	672	47				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	66	46	307	330	59	40	326	764	260	17	672	47				
			Site Generated	8	6	23		8		24				6					
			Pass By	21		22				41	-41	0		-22	11				
			Total Site Gen	29	6	45	0	8	0	65	-41	0	0	-22	17				
			Total Future	95	52	352	330	67	40	391	723	260	17	650	64				

Count Date: 1/25/2024

Count Year: 2024

Existing Adj. Year: 2024

Existing Adjustment Rate: 1.00

Growth Rate: 0.5%

Buildout Year: 2024

Scenario: m.d. Peak Hour

Bckgrd. Dev. A:

Bckgrd. Dev. B:

Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#2 - Novi Road & Oaks Drive North	m.d. Peak Hour 01/25/24 12:00 p.m. - 1:00 p.m.		PHF	0.92			0.80			0.91			0.92						
			% Heavy	1%			2%			3%			1%						
		2024	Existing	43	17	105	27	20	45	87	757	26	85	604	19	58	25	1	0
		2024	Existing Adj.	43	17	105	27	20	45	87	757	26	85	604	19				
		2024	Background	43	17	105	27	20	45	87	757	26	85	604	19				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	43	17	105	27	20	45	87	757	26	85	604	19				
			Site Generated	7							8			6	7				
			Pass By	20							-20			-11	11				
			Total Site Gen	27	0	0	0	0	0	0	-12	0	0	-5	18				
			Total Future	70	17	105	27	20	45	87	745	26	85	599	37				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#3 - Oaks Drive South & Karevich Drive/Site DW	m.d. Peak Hour 01/25/24 12:00 p.m. - 1:00 p.m.		PHF	0.82			0.93			0.81			0.60						
			% Heavy	1%			1%			1%			0%						
		2024	Existing	1	302	9	106	320	9	7	0	90	6	1	1				
		2024	Existing Adj.	1	302	9	106	320	9	7	0	90	6	1	1				
		2024	Background	1	302	9	106	320	9	7	0	90	6	1	1				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	1	302	9	106	320	9	7	0	90	6	1	1				
			Site Generated	7				38					37		8				
			Pass By					52					43						
			Total Site Gen	7	0	0	0	0	0	90	0	0	80	0	8				
			Total Future	8	302	9	106	320	99	7	0	90	86	1	9				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#4 - Oaks Drive North & Karevich Drive	m.d. Peak Hour 01/25/24 11:45 a.m. - 12:45 p.m.		PHF	0.83			0.81			0.75									
			% Heavy	1%			1%			0%									
		2024	Existing	0	163	3	8	118	0	1	0	2							
		2024	Existing Adj.	0	163	3	8	118	0	1	0	2	0	0	0				
		2024	Background	0	163	3	8	118	0	1	0	2	0	0	0				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	163	3	8	118	0	1	0	2	0	0	0				
			Site Generated					7					7						
			Pass By					11					20						
			Total Site Gen	0	0	0	13	0	0	0	0	27	0	0	0				
			Total Future	0	163	3	25	118	0	1	0	29	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#1 - Novi Road & Oaks Drive South/Twelve Oaks Drive	p.m. Peak Hour 01/25/24 4:45 p.m. - 5:45 p.m.	2024	PHF	0.87			0.84			0.91			0.95						
			% Heavy	0%			0%			1%			0%						
			Existing	79	41	426	339	63	39	349	874	175	21	803	56	90	7	65	15
			Existing Adj.	79	41	426	339	63	39	349	874	175	21	803	56				
			Background	79	41	426	339	63	39	349	874	175	21	803	56				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	79	41	426	339	63	39	349	874	175	21	803	56				
			Site Generated	5	2	14		4		14				5					
			Pass By	11		14				24	-24			-15	8				
			Total Site Gen	16	2	28	0	4	0	38	-24	0	0	-15	13				
			Total Future	95	43	454	339	67	39	387	850	175	21	788	69				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#2 - Novi Road & Oaks Drive North	p.m. Peak Hour 01/25/24 4:30 p.m. - 5:30 p.m.	2024	PHF	0.91			0.76			0.88			0.93						
			% Heavy	1%			0%			1%			1%						
			Existing	48	12	93	48	33	49	79	869	44	49	739	29	53	15	0	1
			Existing Adj.	48	12	93	48	33	49	79	869	44	49	739	29				
			Background	48	12	93	48	33	49	79	869	44	49	739	29				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	48	12	93	48	33	49	79	869	44	49	739	29				
			Site Generated	4						5			5	4					
			Pass By	11						-13				-7	7				
			Total Site Gen	15	0	0	0	0	0	0	-8	0	0	-2	11				
			Total Future	63	12	93	48	33	49	79	861	44	49	737	40				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#3 - Oaks Drive South & Karevich Drive/Site DW	p.m. Peak Hour 01/25/24 4:15 p.m. - 5:15 p.m.	2024	PHF	0.85			0.95			0.93			0.60						
			% Heavy	1%			0%			0%			0%						
			Existing	1	410	24	111	335	4	5	1	94	2	0	2				
			Existing Adj.	1	410	24	111	335	4	5	1	94	2	0	2				
			Background	1	410	24	111	335	4	5	1	94	2	0	2				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	1	410	24	111	335	4	5	1	94	2	0	2				
			Site Generated	5					23				21	4					
			Pass By						32				25						
			Total Site Gen	5	0	0	0	0	55	0	0	0	46	0	4				
			Total Future	6	410	24	111	335	59	5	1	94	48	0	6				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#4 - Oaks Drive North & Karevich Drive	p.m. Peak Hour 01/25/24 4:30 p.m. - 5:30 p.m.	2024	PHF	0.86			0.61			0.60									
			% Heavy	1%			2%			0%									
			Existing	0	150	3	4	137	0	2	0	3							
			Existing Adj.	0	150	3	4	137	0	2	0	3	0	0	0				
			Background	0	150	3	4	137	0	2	0	3	0	0	0				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	150	3	4	137	0	2	0	3	0	0	0				
			Site Generated					4					4						
			Pass By					7				11							
			Total Site Gen	0	0	0	11	0	0	0	0	15	0	0	0				
			Total Future	0	150	3	15	137	0	2	0	18	0	0	0				

Count Date: 1/25/2024
Count Year: 2024
Existing Adj. Year: 2024
Existing Adjustment Rate: 1.00
Growth Rate: 0.5%
Buildout Year: 2024
Scenario: p.m. Peak Hour

Bckgrd. Dev. A:
Bckgrd. Dev. B:
Bckgrd. Dev. C:

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Dr Eastbound								Twelve Oaks Dr Westbound							
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*	
2024-01-25 11:00AM	9	13	44	0	10	76	0		61	17	4	0	0	82	0	
11:15AM	6	14	44	0	6	70	0		61	17	5	0	0	83	0	
11:30AM	16	13	53	0	12	94	0		68	8	5	0	1	82	0	
11:45AM	10	16	47	0	11	84	0		79	8	7	0	3	97	0	
Hourly Total	41	56	188	0	39	324	0		269	50	21	0	4	344	0	
12:00PM	18	10	56	0	5	89	0		77	12	5	0	1	95	0	
12:15PM	10	14	77	0	2	103	0		79	18	10	0	1	108	0	
12:30PM	20	10	81	0	3	114	0		91	18	9	0	0	118	0	
12:45PM	18	12	81	0	2	113	0		83	11	13	0	1	108	0	
Hourly Total	66	46	295	0	12	419	0		330	59	37	0	3	429	0	
4:00PM	24	11	81	0	5	121	0		86	23	13	0	1	123	0	
4:15PM	34	16	105	0	4	159	0		72	29	16	1	0	118	0	
4:30PM	23	11	92	0	0	126	0		85	15	14	0	2	116	0	
4:45PM	17	7	91	0	4	119	0		74	22	8	0	2	106	0	
Hourly Total	98	45	369	0	13	525	0		317	89	51	1	5	463	0	
5:00PM	25	13	78	0	32	148	0		100	22	6	0	3	131	0	
5:15PM	25	9	92	0	28	154	0		91	12	4	0	1	108	0	
5:30PM	12	12	75	0	26	125	0		74	7	14	0	1	96	0	
5:45PM	9	6	71	0	27	113	0		84	13	12	0	0	109	0	
Hourly Total	71	40	316	0	113	540	0		349	54	36	0	5	444	0	
Total	276	187	1168	0	177	1808	0		1265	252	145	1	17	1680	0	
% Approach	15.3%	10.3%	64.6%	0%	9.8%	-	-		75.3%	15.0%	8.6%	0.1%	1.0%	-	-	
% Total	2.4%	1.6%	10.2%	0%	1.5%	15.8%	-		11.0%	2.2%	1.3%	0%	0.1%	14.7%	-	
Lights	274	186	1157	0	177	1794	-		1259	249	142	1	17	1668	-	
% Lights	99.3%	99.5%	99.1%	0%	100%	99.2%	-		99.5%	98.8%	97.9%	100%	100%	99.3%	-	
Articulated Trucks	0	0	1	0	0	1	-		1	0	0	0	0	1	-	
% Articulated Trucks	0%	0%	0.1%	0%	0%	0.1%	-		0.1%	0%	0%	0%	0%	0.1%	-	
Buses and Single-Unit Trucks	2	1	10	0	0	13	-		5	3	3	0	0	11	-	
% Buses and Single-Unit Trucks	0.7%	0.5%	0.9%	0%	0%	0.7%	-		0.4%	1.2%	2.1%	0%	0%	0.7%	-	
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-	

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Novi Road Northbound								Novi Road Southbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*		Int
2024-01-25 11:00AM	62	105	33	0	18	218	0		3	121	6	0	2	132	0		508
11:15AM	86	108	36	0	23	253	0		6	132	4	0	0	142	0		548
11:30AM	63	108	32	0	13	216	0		5	136	12	0	2	155	0		547
11:45AM	90	134	42	0	15	281	0		7	152	14	0	5	178	0		640
Hourly Total	301	455	143	0	69	968	0		21	541	36	0	9	607	0		2243
12:00PM	87	150	36	0	22	295	0		4	170	11	0	3	188	0		667
12:15PM	87	191	31	0	24	333	0		4	161	5	0	5	175	0		719
12:30PM	79	216	34	0	35	364	0		6	162	6	0	6	180	0		776
12:45PM	73	207	43	0	35	358	0		3	169	8	0	2	182	0		761
Hourly Total	326	764	144	0	116	1350	0		17	662	30	0	16	725	0		2923
4:00PM	68	208	16	0	9	301	0		7	197	7	0	6	217	0		762
4:15PM	71	174	19	0	16	280	0		9	192	10	0	0	211	0		768
4:30PM	72	191	17	0	26	306	0		8	183	5	0	7	203	1		751
4:45PM	94	199	22	0	11	326	0		6	194	10	0	3	213	0		764
Hourly Total	305	772	74	0	62	1213	0		30	766	32	0	16	844	1		3045
5:00PM	84	250	33	0	17	384	0		8	205	12	0	3	228	0		891
5:15PM	82	215	31	0	17	345	0		6	210	7	0	2	225	0		832
5:30PM	89	210	24	0	20	343	0		1	194	12	0	7	214	0		778
5:45PM	87	179	26	0	24	316	0		6	189	7	0	2	204	0		742
Hourly Total	342	854	114	0	78	1388	0		21	798	38	0	14	871	0		3243
Total	1274	2845	475	0	325	4919	0		89	2767	136	0	55	3047	1		11454
% Approach	25.9%	57.8%	9.7%	0%	6.6%	-	-		2.9%	90.8%	4.5%	0%	1.8%	-	-		-
% Total	11.1%	24.8%	4.1%	0%	2.8%	42.9%	-		0.8%	24.2%	1.2%	0%	0.5%	26.6%	-		-
Lights	1263	2788	475	0	322	4848	-		89	2739	135	0	55	3018	-		11328
% Lights	99.1%	98.0%	100%	0%	99.1%	98.6%	-		100%	99.0%	99.3%	0%	100%	99.0%	-		98.9%
Articulated Trucks	1	16	0	0	1	18	-		0	7	0	0	0	7	-		27
% Articulated Trucks	0.1%	0.6%	0%	0%	0.3%	0.4%	-		0%	0.3%	0%	0%	0%	0.2%	-		0.2%
Buses and Single-Unit Trucks	10	41	0	0	2	53	-		0	21	1	0	0	22	-		99
% Buses and Single-Unit Trucks	0.8%	1.4%	0%	0%	0.6%	1.1%	-		0%	0.8%	0.7%	0%	0%	0.7%	-		0.9%
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	1		-
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	100%		-
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0		-
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	0%		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

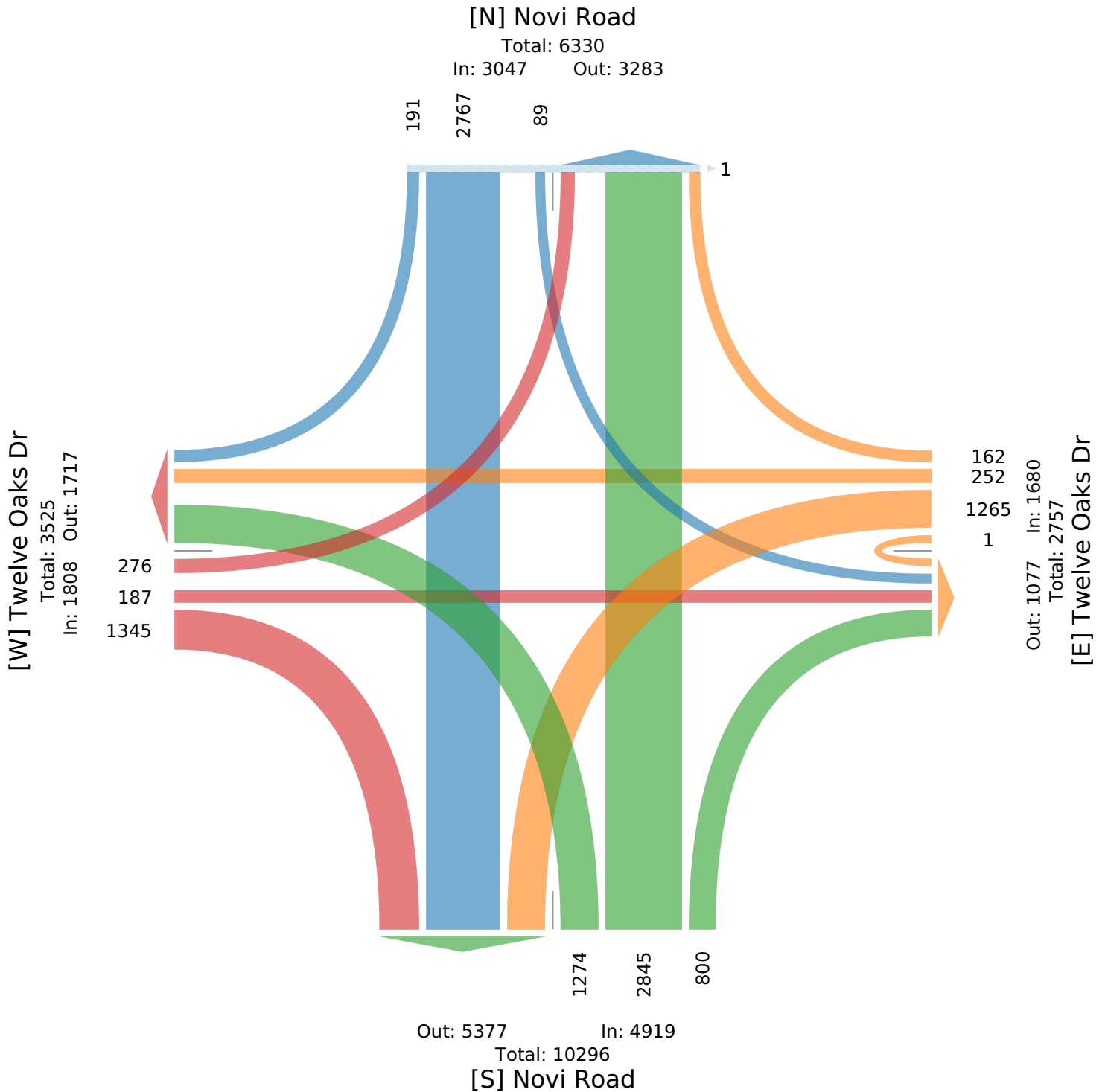
Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Dr Eastbound							Twelve Oaks Dr Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
2024-01-25 12:00PM	18	10	56	0	5	89	0	77	12	5	0	1	95	0
12:15PM	10	14	77	0	2	103	0	79	18	10	0	1	108	0
12:30PM	20	10	81	0	3	114	0	91	18	9	0	0	118	0
12:45PM	18	12	81	0	2	113	0	83	11	13	0	1	108	0
Total	66	46	295	0	12	419	0	330	59	37	0	3	429	0
% Approach	15.8%	11.0%	70.4%	0%	2.9%	-	-	76.9%	13.8%	8.6%	0%	0.7%	-	-
% Total	2.3%	1.6%	10.1%	0%	0.4%	14.3%	-	11.3%	2.0%	1.3%	0%	0.1%	14.7%	-
PHF	0.825	0.821	0.910	-	0.600	0.919	-	0.907	0.819	0.712	-	0.750	0.909	-
Lights	66	46	291	0	12	415	-	327	59	35	0	3	424	-
% Lights	100%	100%	98.6%	0%	100%	99.0%	-	99.1%	100%	94.6%	0%	100%	98.8%	-
Articulated Trucks	0	0	0	0	0	0	-	0	0	0	0	0	0	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Buses and Single-Unit Trucks	0	0	4	0	0	4	-	3	0	2	0	0	5	-
% Buses and Single-Unit Trucks	0%	0%	1.4%	0%	0%	1.0%	-	0.9%	0%	5.4%	0%	0%	1.2%	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Novi Road Northbound								Novi Road Southbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*		Int
2024-01-25 12:00PM	87	150	36	0	22	295	0		4	170	11	0	3	188	0		667
12:15PM	87	191	31	0	24	333	0		4	161	5	0	5	175	0		719
12:30PM	79	216	34	0	35	364	0		6	162	6	0	6	180	0		776
12:45PM	73	207	43	0	35	358	0		3	169	8	0	2	182	0		761
Total	326	764	144	0	116	1350	0		17	662	30	0	16	725	0		2923
% Approach	24.1%	56.6%	10.7%	0%	8.6%	-	-		2.3%	91.3%	4.1%	0%	2.2%	-	-		-
% Total	11.2%	26.1%	4.9%	0%	4.0%	46.2%	-		0.6%	22.6%	1.0%	0%	0.5%	24.8%	-		-
PHF	0.937	0.884	0.837	-	0.829	0.927	-		0.708	0.974	0.682	-	0.667	0.964	-		0.942
Lights	321	739	144	0	115	1319	-		17	652	30	0	16	715	-		2873
% Lights	98.5%	96.7%	100%	0%	99.1%	97.7%	-		100%	98.5%	100%	0%	100%	98.6%	-		98.3%
Articulated Trucks	1	9	0	0	0	10	-		0	3	0	0	0	3	-		13
% Articulated Trucks	0.3%	1.2%	0%	0%	0%	0.7%	-		0%	0.5%	0%	0%	0%	0.4%	-		0.4%
Buses and Single-Unit Trucks	4	16	0	0	1	21	-		0	7	0	0	0	7	-		37
% Buses and Single-Unit Trucks	1.2%	2.1%	0%	0%	0.9%	1.6%	-		0%	1.1%	0%	0%	0%	1.0%	-		1.3%
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0		
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

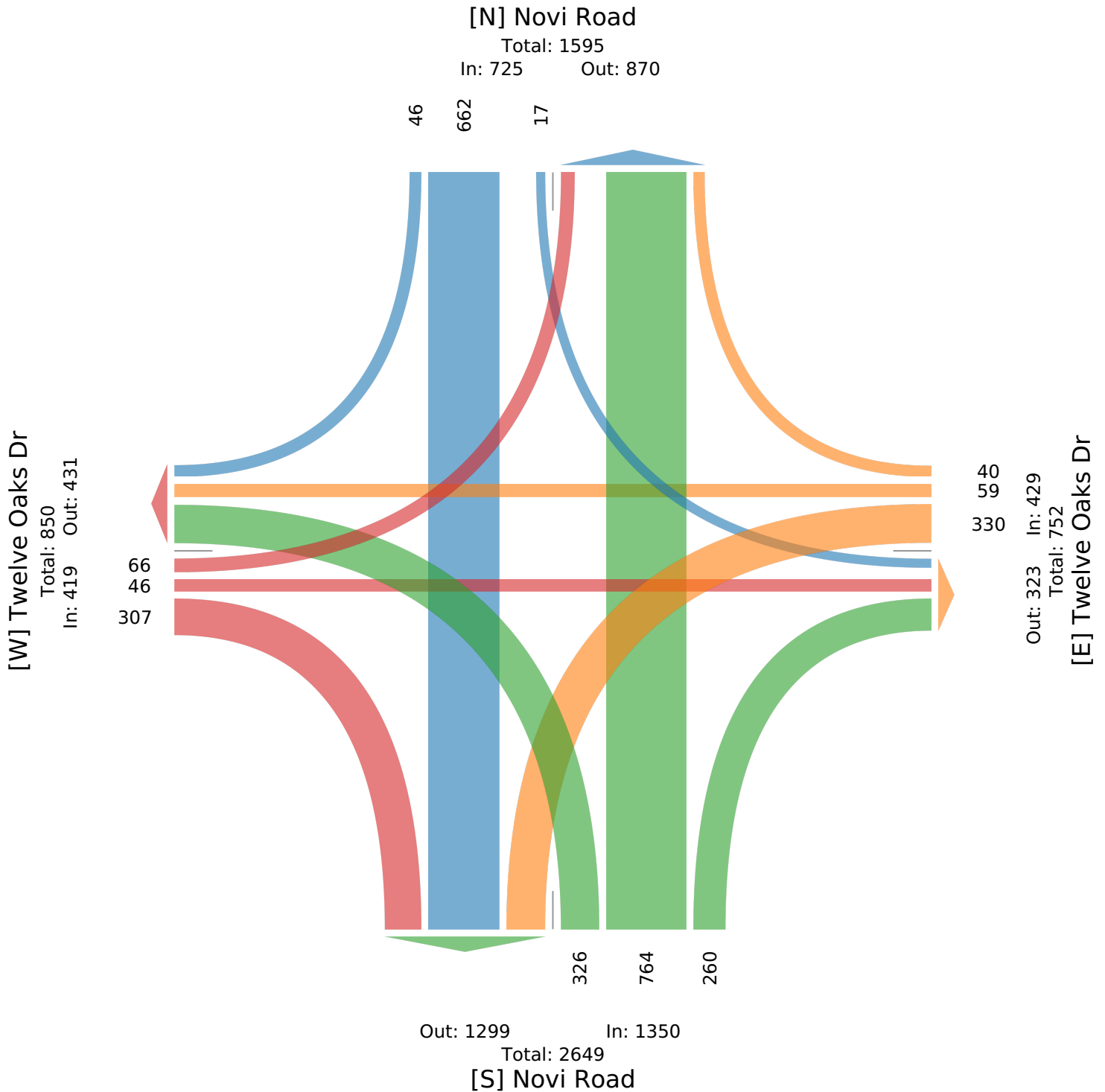
Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

Thu Jan 25, 2024

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Dr Eastbound								Twelve Oaks Dr Westbound							
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*	
2024-01-25 4:45PM	17	7	91	0	4	119	0		74	22	8	0	2	106	0	
5:00PM	25	13	78	0	32	148	0		100	22	6	0	3	131	0	
5:15PM	25	9	92	0	28	154	0		91	12	4	0	1	108	0	
5:30PM	12	12	75	0	26	125	0		74	7	14	0	1	96	0	
Total	79	41	336	0	90	546	0		339	63	32	0	7	441	0	
% Approach	14.5%	7.5%	61.5%	0%	16.5%	-	-		76.9%	14.3%	7.3%	0%	1.6%	-	-	
% Total	2.4%	1.3%	10.3%	0%	2.8%	16.7%	-		10.4%	1.9%	1.0%	0%	0.2%	13.5%	-	
PHF	0.790	0.788	0.913	-	0.703	0.886	-		0.848	0.716	0.571	-	0.583	0.842	-	
Lights	79	41	335	0	90	545	-		339	63	32	0	7	441	-	
% Lights	100%	100%	99.7%	0%	100%	99.8%	-		100%	100%	100%	0%	100%	100%	-	
Articulated Trucks	0	0	0	0	0	0	-		0	0	0	0	0	0	-	
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	0%	-	
Buses and Single-Unit Trucks	0	0	1	0	0	1	-		0	0	0	0	0	0	-	
% Buses and Single-Unit Trucks	0%	0%	0.3%	0%	0%	0.2%	-		0%	0%	0%	0%	0%	0%	-	
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-	

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

Thu Jan 25, 2024

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Novi Road Northbound								Novi Road Southbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*		Int
2024-01-25 4:45PM	94	199	22	0	11	326	0		6	194	10	0	3	213	0		764
5:00PM	84	250	33	0	17	384	0		8	205	12	0	3	228	0		891
5:15PM	82	215	31	0	17	345	0		6	210	7	0	2	225	0		832
5:30PM	89	210	24	0	20	343	0		1	194	12	0	7	214	0		778
Total	349	874	110	0	65	1398	0		21	803	41	0	15	880	0		3265
% Approach	25.0%	62.5%	7.9%	0%	4.6%	-	-		2.4%	91.3%	4.7%	0%	1.7%	-	-		-
% Total	10.7%	26.8%	3.4%	0%	2.0%	42.8%	-		0.6%	24.6%	1.3%	0%	0.5%	27.0%	-		-
PHF	0.928	0.874	0.833	-	0.813	0.910	-		0.656	0.956	0.854	-	0.536	0.965	-		0.916
Lights	349	865	110	0	65	1389	-		21	800	41	0	15	877	-		3252
% Lights	100%	99.0%	100%	0%	100%	99.4%	-		100%	99.6%	100%	0%	100%	99.7%	-		99.6%
Articulated Trucks	0	2	0	0	0	2	-		0	1	0	0	0	1	-		3
% Articulated Trucks	0%	0.2%	0%	0%	0%	0.1%	-		0%	0.1%	0%	0%	0%	0.1%	-		0.1%
Buses and Single-Unit Trucks	0	7	0	0	0	7	-		0	2	0	0	0	2	-		10
% Buses and Single-Unit Trucks	0%	0.8%	0%	0%	0%	0.5%	-		0%	0.2%	0%	0%	0%	0.2%	-		0.3%
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0		
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Mall Rd/W Oaks Dri... - TMC

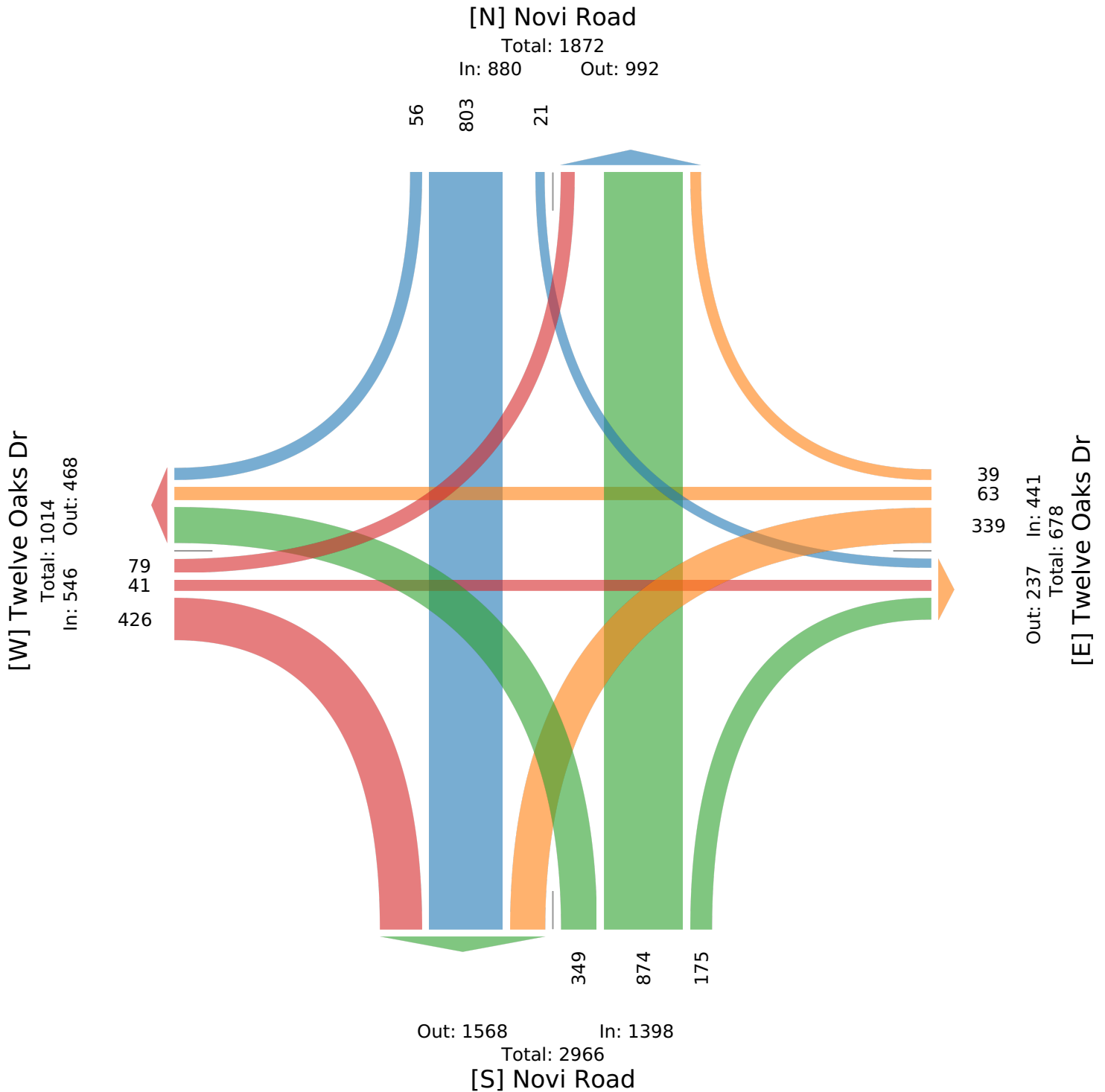
Thu Jan 25, 2024

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150529, Location: 42.491092, -83.476059



Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Dr Eastbound							Twelve Oaks Dr Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
2024-01-25 11:00AM	6	2	7	0	13	28	0	7	1	2	0	8	18	0
11:15AM	14	5	7	0	5	31	0	7	6	5	1	10	29	0
11:30AM	11	4	5	0	10	30	0	11	4	4	0	6	25	0
11:45AM	8	0	2	0	21	31	0	9	2	3	0	4	18	0
Hourly Total	39	11	21	0	49	120	0	34	13	14	1	28	90	0
12:00PM	7	9	14	0	13	43	0	9	3	4	0	9	25	0
12:15PM	14	3	10	0	18	45	0	9	3	5	0	2	19	0
12:30PM	11	2	16	0	10	39	0	5	10	7	0	6	28	0
12:45PM	11	3	7	0	17	38	0	4	2	4	0	8	18	0
Hourly Total	43	17	47	0	58	165	0	27	18	20	0	25	90	0
4:00PM	16	0	7	0	5	28	0	11	4	4	0	7	26	0
4:15PM	11	1	3	0	19	34	0	8	4	6	0	7	25	0
4:30PM	14	4	10	0	14	42	0	10	4	4	0	6	24	1
4:45PM	10	3	9	0	10	32	0	12	5	10	0	4	31	0
Hourly Total	51	8	29	0	48	136	0	41	17	24	0	24	106	1
5:00PM	10	3	7	0	17	37	0	11	17	13	0	2	43	0
5:15PM	14	2	13	0	12	41	0	15	7	7	0	3	32	0
5:30PM	6	4	2	0	5	17	0	9	4	9	0	6	28	0
5:45PM	14	3	9	0	14	40	0	7	2	6	0	7	22	0
Hourly Total	44	12	31	0	48	135	0	42	30	35	0	18	125	0
Total	177	48	128	0	203	556	0	144	78	93	1	95	411	1
% Approach	31.8%	8.6%	23.0%	0%	36.5%	-	-	35.0%	19.0%	22.6%	0.2%	23.1%	-	-
% Total	2.5%	0.7%	1.8%	0%	2.9%	7.9%	-	2.0%	1.1%	1.3%	0%	1.3%	5.8%	-
Lights	175	46	126	0	203	550	-	144	78	93	1	91	407	-
% Lights	98.9%	95.8%	98.4%	0%	100%	98.9%	-	100%	100%	100%	100%	95.8%	99.0%	-
Articulated Trucks	1	0	0	0	0	1	-	0	0	0	0	1	1	-
% Articulated Trucks	0.6%	0%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	1.1%	0.2%	-
Buses and Single-Unit Trucks	1	2	2	0	0	5	-	0	0	0	0	3	3	-
% Buses and Single-Unit Trucks	0.6%	4.2%	1.6%	0%	0%	0.9%	-	0%	0%	0%	0%	3.2%	0.7%	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	1
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0%

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Novi Road Northbound								Novi Road Southbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*		Int
2024-01-25 11:00AM	16	90	6	0	0	112	0		19	102	7	0	0	128	0		286
11:15AM	21	78	8	0	1	108	0		19	125	4	0	0	148	0		316
11:30AM	23	92	8	0	0	123	0		24	135	3	0	0	162	0		340
11:45AM	26	114	6	0	0	146	0		25	151	11	0	0	187	0		382
Hourly Total	86	374	28	0	1	489	0		87	513	25	0	0	625	0		1324
12:00PM	21	141	6	0	1	169	0		20	144	5	0	0	169	0		406
12:15PM	18	184	7	0	0	209	0		21	137	0	0	0	158	0		431
12:30PM	22	197	6	0	0	225	0		27	154	5	0	0	186	0		478
12:45PM	17	206	6	0	0	229	0		17	169	7	0	0	193	0		478
Hourly Total	78	728	25	0	1	832	0		85	604	17	0	0	706	0		1793
4:00PM	17	196	9	0	0	222	0		18	203	6	0	0	227	0		503
4:15PM	5	193	4	0	0	202	0		13	185	6	0	0	204	0		465
4:30PM	20	198	13	0	0	231	0		13	178	5	0	0	196	0		493
4:45PM	15	191	7	0	0	213	0		17	191	11	0	0	219	0		495
Hourly Total	57	778	33	0	0	868	0		61	757	28	0	0	846	0		1956
5:00PM	26	227	13	0	0	266	0		6	184	3	0	0	193	0		539
5:15PM	14	208	9	0	0	231	0		13	180	9	0	1	203	0		507
5:30PM	19	197	10	0	0	226	0		11	198	4	0	0	213	0		484
5:45PM	26	168	6	0	0	200	0		23	172	6	0	0	201	0		463
Hourly Total	85	800	38	0	0	923	0		53	734	22	0	1	810	0		1993
Total	306	2680	124	0	2	3112	0		286	2608	92	0	1	2987	0		7066
% Approach	9.8%	86.1%	4.0%	0%	0.1%	-	-		9.6%	87.3%	3.1%	0%	0%	-	-		-
% Total	4.3%	37.9%	1.8%	0%	0%	44.0%	-		4.0%	36.9%	1.3%	0%	0%	42.3%	-		-
Lights	303	2630	122	0	2	3057	-		286	2578	88	0	1	2953	-		6967
% Lights	99.0%	98.1%	98.4%	0%	100%	98.2%	-		100%	98.8%	95.7%	0%	100%	98.9%	-		98.6%
Articulated Trucks	0	15	0	0	0	15	-		0	6	0	0	0	6	-		23
% Articulated Trucks	0%	0.6%	0%	0%	0%	0.5%	-		0%	0.2%	0%	0%	0%	0.2%	-		0.3%
Buses and Single-Unit Trucks	3	35	2	0	0	40	-		0	24	4	0	0	28	-		76
% Buses and Single-Unit Trucks	1.0%	1.3%	1.6%	0%	0%	1.3%	-		0%	0.9%	4.3%	0%	0%	0.9%	-		1.1%
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0		-
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0		-
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Drive N - TMC

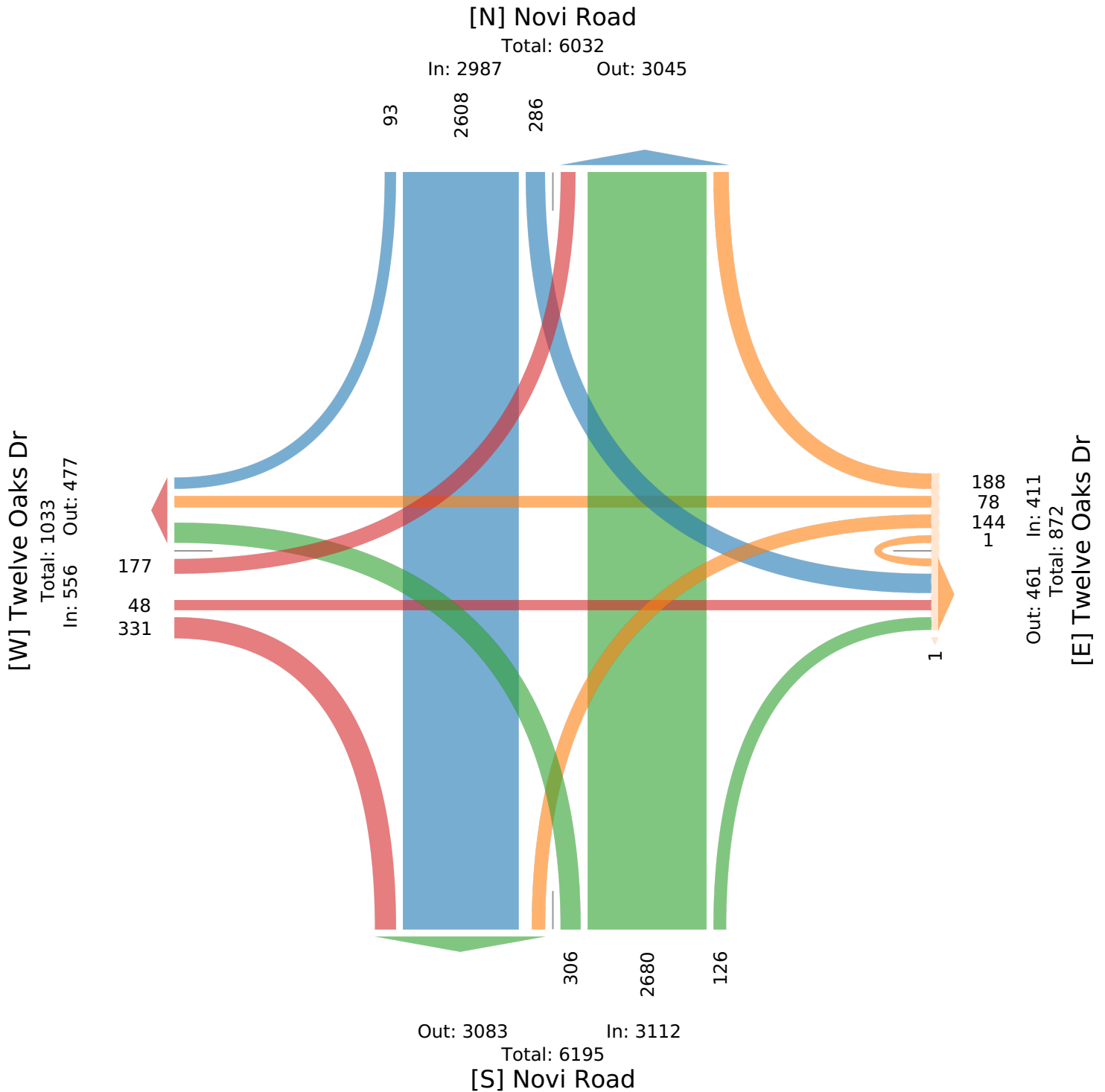
Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Dr Eastbound							Twelve Oaks Dr Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
2024-01-25 12:00PM	7	9	14	0	13	43	0	9	3	4	0	9	25	0
12:15PM	14	3	10	0	18	45	0	9	3	5	0	2	19	0
12:30PM	11	2	16	0	10	39	0	5	10	7	0	6	28	0
12:45PM	11	3	7	0	17	38	0	4	2	4	0	8	18	0
Total	43	17	47	0	58	165	0	27	18	20	0	25	90	0
% Approach	26.1%	10.3%	28.5%	0%	35.2%	-	-	30.0%	20.0%	22.2%	0%	27.8%	-	-
% Total	2.4%	0.9%	2.6%	0%	3.2%	9.2%	-	1.5%	1.0%	1.1%	0%	1.4%	5.0%	-
PHF	0.768	0.472	0.734	-	0.806	0.917	-	0.750	0.450	0.714	-	0.694	0.804	-
Lights	43	16	46	0	58	163	-	27	18	20	0	23	88	-
% Lights	100%	94.1%	97.9%	0%	100%	98.8%	-	100%	100%	100%	0%	92.0%	97.8%	-
Articulated Trucks	0	0	0	0	0	0	-	0	0	0	0	0	0	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Buses and Single-Unit Trucks	0	1	1	0	0	2	-	0	0	0	0	2	2	-
% Buses and Single-Unit Trucks	0%	5.9%	2.1%	0%	0%	1.2%	-	0%	0%	0%	0%	8.0%	2.2%	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Novi Road Northbound								Novi Road Southbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*		Int
2024-01-25 12:00PM	21	141	6	0	1	169	0		20	144	5	0	0	169	0		406
12:15PM	18	184	7	0	0	209	0		21	137	0	0	0	158	0		431
12:30PM	22	197	6	0	0	225	0		27	154	5	0	0	186	0		478
12:45PM	17	206	6	0	0	229	0		17	169	7	0	0	193	0		478
Total	78	728	25	0	1	832	0		85	604	17	0	0	706	0		1793
% Approach	9.4%	87.5%	3.0%	0%	0.1%	-	-		12.0%	85.6%	2.4%	0%	0%	-	-		-
% Total	4.4%	40.6%	1.4%	0%	0.1%	46.4%	-		4.7%	33.7%	0.9%	0%	0%	39.4%	-		-
PHF	0.886	0.883	0.893	-	0.250	0.908	-		0.787	0.893	0.607	-	-	0.915	-		0.938
Lights	77	703	25	0	1	806	-		85	594	17	0	0	696	-		1753
% Lights	98.7%	96.6%	100%	0%	100%	96.9%	-		100%	98.3%	100%	0%	0%	98.6%	-		97.8%
Articulated Trucks	0	6	0	0	0	6	-		0	3	0	0	0	3	-		9
% Articulated Trucks	0%	0.8%	0%	0%	0%	0.7%	-		0%	0.5%	0%	0%	0%	0.4%	-		0.5%
Buses and Single-Unit Trucks	1	19	0	0	0	20	-		0	7	0	0	0	7	-		31
% Buses and Single-Unit Trucks	1.3%	2.6%	0%	0%	0%	2.4%	-		0%	1.2%	0%	0%	0%	1.0%	-		1.7%
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0		
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Drive N - TMC

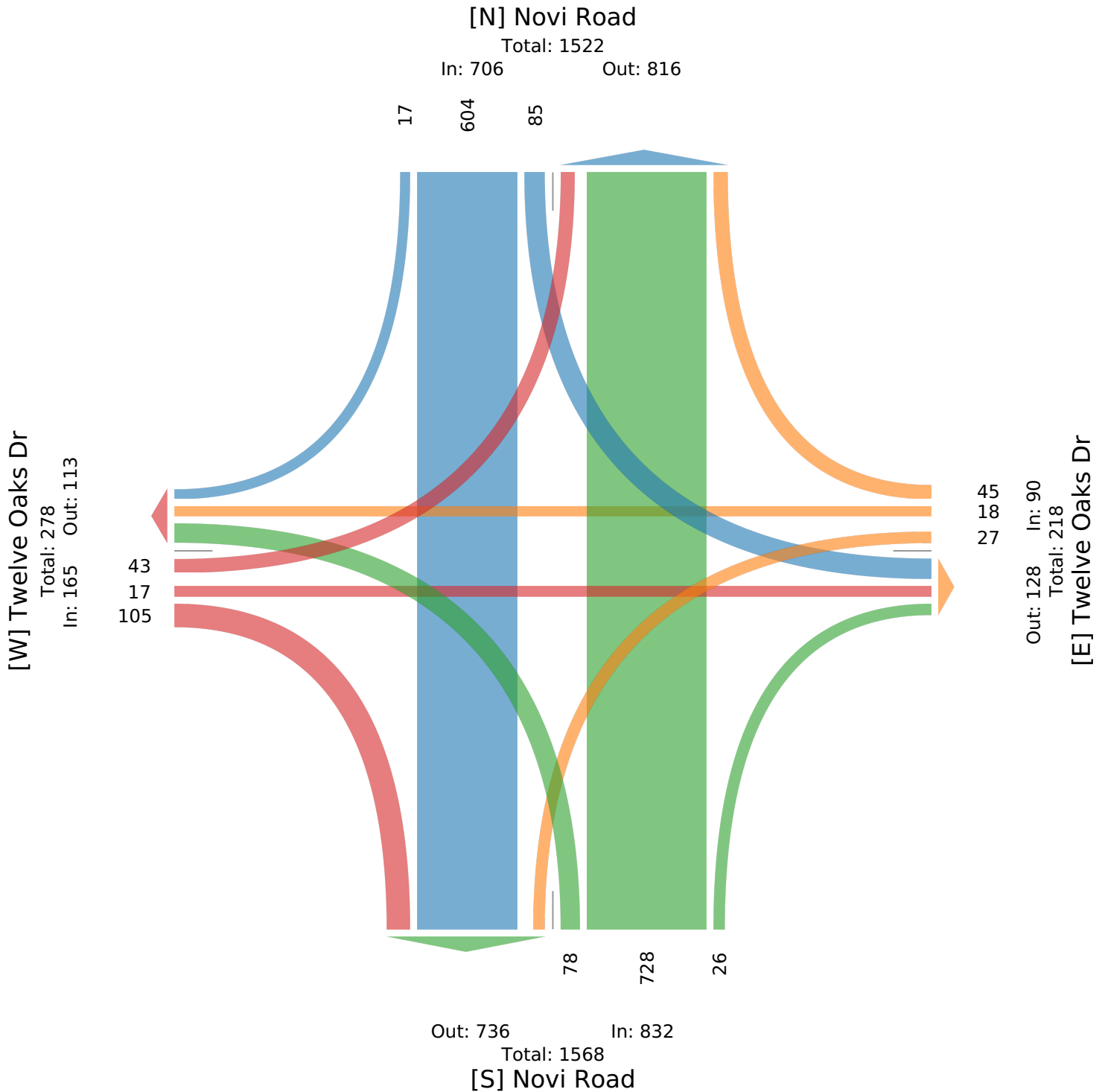
Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

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

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Dr Eastbound							Twelve Oaks Dr Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
2024-01-25 4:30PM	14	4	10	0	14	42	0	10	4	4	0	6	24	1
4:45PM	10	3	9	0	10	32	0	12	5	10	0	4	31	0
5:00PM	10	3	7	0	17	37	0	11	17	13	0	2	43	0
5:15PM	14	2	13	0	12	41	0	15	7	7	0	3	32	0
Total	48	12	39	0	53	152	0	48	33	34	0	15	130	1
% Approach	31.6%	7.9%	25.7%	0%	34.9%	-	-	36.9%	25.4%	26.2%	0%	11.5%	-	-
% Total	2.4%	0.6%	1.9%	0%	2.6%	7.5%	-	2.4%	1.6%	1.7%	0%	0.7%	6.4%	-
PHF	0.857	0.750	0.750	-	0.779	0.905	-	0.800	0.485	0.654	-	0.625	0.756	-
Lights	47	12	39	0	53	151	-	48	33	34	0	15	130	-
% Lights	97.9%	100%	100%	0%	100%	99.3%	-	100%	100%	100%	0%	100%	100%	-
Articulated Trucks	0	0	0	0	0	0	-	0	0	0	0	0	0	-
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-
Buses and Single-Unit Trucks	1	0	0	0	0	1	-	0	0	0	0	0	0	-
% Buses and Single-Unit Trucks	2.1%	0%	0%	0%	0%	0.7%	-	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	1
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0%

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

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

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Novi Road Northbound								Novi Road Southbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	RR	App	Ped*		Int
2024-01-25 4:30PM	20	198	13	0	0	231	0		13	178	5	0	0	196	0		493
4:45PM	15	191	7	0	0	213	0		17	191	11	0	0	219	0		495
5:00PM	26	227	13	0	0	266	0		6	184	3	0	0	193	0		539
5:15PM	14	208	9	0	0	231	0		13	180	9	0	1	203	0		507
Total	75	824	42	0	0	941	0		49	733	28	0	1	811	0		2034
% Approach	8.0%	87.6%	4.5%	0%	0%	-	-		6.0%	90.4%	3.5%	0%	0.1%	-	-		-
% Total	3.7%	40.5%	2.1%	0%	0%	46.3%	-		2.4%	36.0%	1.4%	0%	0%	39.9%	-		-
PHF	0.721	0.907	0.808	-	-	0.884	-		0.721	0.959	0.636	-	0.250	0.926	-		0.943
Lights	75	818	42	0	0	935	-		49	731	26	0	1	807	-		2023
% Lights	100%	99.3%	100%	0%	0%	99.4%	-		100%	99.7%	92.9%	0%	100%	99.5%	-		99.5%
Articulated Trucks	0	2	0	0	0	2	-		0	0	0	0	0	0	-		2
% Articulated Trucks	0%	0.2%	0%	0%	0%	0.2%	-		0%	0%	0%	0%	0%	0%	-		0.1%
Buses and Single-Unit Trucks	0	4	0	0	0	4	-		0	2	2	0	0	4	-		9
% Buses and Single-Unit Trucks	0%	0.5%	0%	0%	0%	0.4%	-		0%	0.3%	7.1%	0%	0%	0.5%	-		0.4%
Pedestrians	-	-	-	-	-	-	0		-	-	-	-	-	-	0		-
% Pedestrians	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	-	0		-
% Bicycles on Crosswalk	-	-	-	-	-	-	-		-	-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Novi Road and Twelve Oaks Drive N - TMC

Thu Jan 25, 2024

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

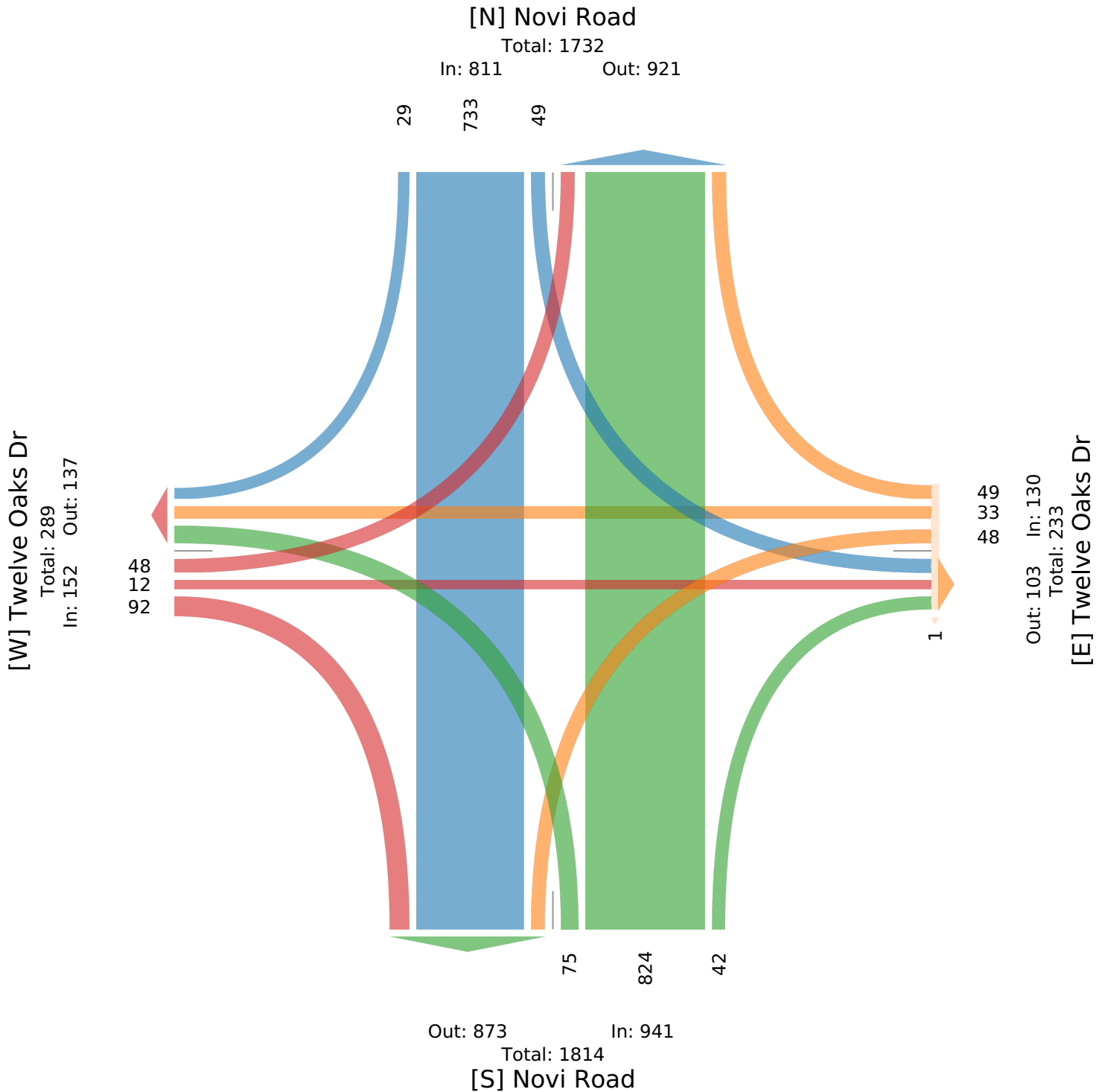
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150533, Location: 42.493327, -83.476122



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US



W Oaks Dr and Karevich Drive/Proposed Site DW - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1150537, Location: 42.491062, -83.477498



Provided by: Fishbeck-Main Account

1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

Leg Direction	W Oaks Dr Eastbound					W Oaks Dr Westbound					N Karevich Dr Northbound					N Karevich Dr Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-01-25 11:00AM	0	59	6	0	65	22	58	2	0	82	0	0	13	0	13	1	0	1	0	2	162
11:15AM	0	49	3	0	52	21	75	0	0	96	0	0	18	0	18	0	1	0	0	1	167
11:30AM	1	67	6	0	74	26	62	3	0	91	1	0	28	0	29	0	0	0	0	0	194
11:45AM	1	64	6	0	71	29	83	2	1	115	0	0	16	0	16	1	0	0	0	1	203
Hourly Total	2	239	21	0	262	98	278	7	1	384	1	0	75	0	76	2	1	1	0	4	726
12:00PM	0	67	3	0	70	42	74	1	0	117	1	0	18	0	19	1	1	0	0	2	208
12:15PM	1	70	0	0	71	15	99	1	1	116	3	0	27	0	30	0	0	1	0	1	218
12:30PM	0	90	5	0	95	27	73	2	2	104	1	0	19	0	20	1	0	0	0	1	220
12:45PM	0	75	1	0	76	22	74	0	2	98	2	0	26	0	28	4	0	0	0	4	206
Hourly Total	1	302	9	0	312	106	320	4	5	435	7	0	90	0	97	6	1	1	0	8	852
4:00PM	0	87	5	0	92	27	75	0	0	102	0	0	28	0	28	0	0	1	0	1	223
4:15PM	0	119	9	0	128	29	85	2	0	116	0	0	24	0	24	1	0	1	0	2	270
4:30PM	0	92	5	0	97	34	75	0	0	109	3	1	21	0	25	0	0	0	0	0	231
4:45PM	1	86	7	0	94	25	87	0	0	112	1	0	26	0	27	1	0	0	0	1	234
Hourly Total	1	384	26	0	411	115	322	2	0	439	4	1	99	0	104	2	0	2	0	4	958
5:00PM	0	113	3	0	116	23	88	2	0	113	1	0	23	0	24	0	0	1	0	1	254
5:15PM	2	117	4	0	123	21	79	0	1	101	0	0	25	0	25	3	0	0	0	3	252
5:30PM	0	95	4	0	99	30	78	1	0	109	4	0	29	0	33	2	0	0	0	2	243
5:45PM	0	98	6	0	104	29	79	1	0	109	1	0	18	0	19	3	0	0	0	3	235
Hourly Total	2	423	17	0	442	103	324	4	1	432	6	0	95	0	101	8	0	1	0	9	984
Total	6	1348	73	0	1427	422	1244	17	7	1690	18	1	359	0	378	18	2	5	0	25	3520
% Approach	0.4%	94.5%	5.1%	0%	-	25.0%	73.6%	1.0%	0.4%	-	4.8%	0.3%	95.0%	0%	-	72.0%	8.0%	20.0%	0%	-	-
% Total	0.2%	38.3%	2.1%	0%	40.5%	12.0%	35.3%	0.5%	0.2%	48.0%	0.5%	0%	10.2%	0%	10.7%	0.5%	0.1%	0.1%	0%	0.7%	-
Lights	6	1343	72	0	1421	419	1236	17	7	1679	18	1	355	0	374	18	2	5	0	25	3499
% Lights	100%	99.6%	98.6%	0%	99.6%	99.3%	99.4%	100%	100%	99.3%	100%	100%	98.9%	0%	98.9%	100%	100%	100%	0%	100%	99.4%
Articulated Trucks	0	0	0	0	0	1	3	0	0	4	0	0	1	0	1	0	0	0	0	0	5
% Articulated Trucks	0%	0%	0%	0%	0%	0.2%	0.2%	0%	0%	0.2%	0%	0%	0.3%	0%	0.3%	0%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	0	5	1	0	6	2	5	0	0	7	0	0	3	0	3	0	0	0	0	0	16
% Buses and Single-Unit Trucks	0%	0.4%	1.4%	0%	0.4%	0.5%	0.4%	0%	0%	0.4%	0%	0%	0.8%	0%	0.8%	0%	0%	0%	0%	0%	0.5%

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

W Oaks Dr and Karevich Drive/Proposed Site DW - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1150537, Location: 42.491062, -83.477498



Provided by: Fishbeck-Main Account

1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

[N] N Karevich Dr

Total: 49

In: 25 Out: 24

5 2 18

[W] W Oaks Dr

Total: 2694

In: 1427 Out: 1267

6 1348 73

17 1244 422 7

In: 1690

Total: 3422

[E] W Oaks Dr

Out: 1732

Out: 497 In: 378
Total: 875

[S] N Karevich Dr

18 1 359

W Oaks Dr and Karevich Drive/Proposed Site DW - TMC

Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1150537, Location: 42.491062, -83.477498



Provided by: Fishbeck-Main Account

1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

Leg Direction	W Oaks Dr Eastbound					W Oaks Dr Westbound					N Karevich Dr Northbound					N Karevich Dr Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-01-25 12:00PM	0	67	3	0	70	42	74	1	0	117	1	0	18	0	19	1	1	0	0	2	208
12:15PM	1	70	0	0	71	15	99	1	1	116	3	0	27	0	30	0	0	1	0	1	218
12:30PM	0	90	5	0	95	27	73	2	2	104	1	0	19	0	20	1	0	0	0	1	220
12:45PM	0	75	1	0	76	22	74	0	2	98	2	0	26	0	28	4	0	0	0	4	206
Total	1	302	9	0	312	106	320	4	5	435	7	0	90	0	97	6	1	1	0	8	852
% Approach	0.3%	96.8%	2.9%	0%	-	24.4%	73.6%	0.9%	1.1%	-	7.2%	0%	92.8%	0%	-	75.0%	12.5%	12.5%	0%	-	-
% Total	0.1%	35.4%	1.1%	0%	36.6%	12.4%	37.6%	0.5%	0.6%	51.1%	0.8%	0%	10.6%	0%	11.4%	0.7%	0.1%	0.1%	0%	0.9%	-
PHF	0.250	0.839	0.450	-	0.821	0.631	0.808	0.500	0.625	0.929	0.583	-	0.833	-	0.808	0.375	0.250	0.250	-	0.500	0.968
Lights	1	301	8	0	310	105	317	4	5	431	7	0	89	0	96	6	1	1	0	8	845
% Lights	100%	99.7%	88.9%	0%	99.4%	99.1%	99.1%	100%	100%	99.1%	100%	0%	98.9%	0%	99.0%	100%	100%	100%	0%	100%	99.2%
Articulated Trucks	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Articulated Trucks	0%	0%	0%	0%	0%	0.9%	0%	0%	0%	0.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.1%
Buses and Single-Unit Trucks	0	1	1	0	2	0	3	0	0	3	0	0	1	0	1	0	0	0	0	0	6
% Buses and Single-Unit Trucks	0%	0.3%	11.1%	0%	0.6%	0%	0.9%	0%	0%	0.7%	0%	0%	1.1%	0%	1.0%	0%	0%	0%	0%	0%	0.7%

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

W Oaks Dr and Karevich Drive/Proposed Site DW - TMC

Thu Jan 25, 2024

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1150537, Location: 42.491062, -83.477498



Provided by: Fishbeck-Main Account

1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

[N] N Karevich Dr

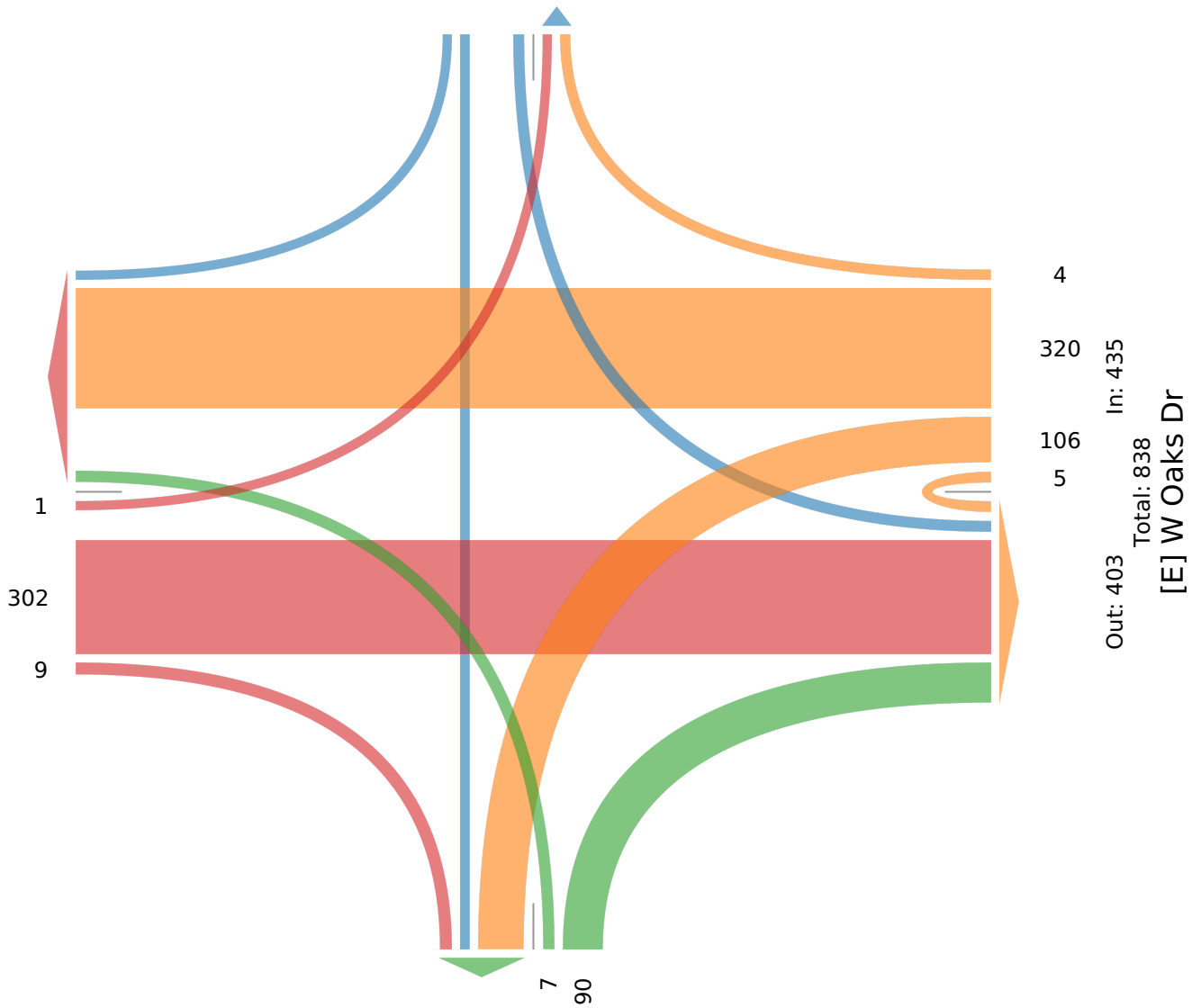
Total: 13

In: 8 Out: 5

1 6

[W] W Oaks Dr

Total: 640
In: 312 Out: 328



Out: 116 In: 97
Total: 213

[S] N Karevich Dr

W Oaks Dr and Karevich Drive/Proposed Site DW - TMC

Thu Jan 25, 2024

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1150537, Location: 42.491062, -83.477498



Provided by: Fishbeck-Main Account

1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

Leg Direction	W Oaks Dr Eastbound					W Oaks Dr Westbound					N Karevich Dr Northbound					N Karevich Dr Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-01-25 4:15PM	0	119	9	0	128	29	85	2	0	116	0	0	24	0	24	1	0	1	0	2	270
4:30PM	0	92	5	0	97	34	75	0	0	109	3	1	21	0	25	0	0	0	0	0	231
4:45PM	1	86	7	0	94	25	87	0	0	112	1	0	26	0	27	1	0	0	0	1	234
5:00PM	0	113	3	0	116	23	88	2	0	113	1	0	23	0	24	0	0	1	0	1	254
Total	1	410	24	0	435	111	335	4	0	450	5	1	94	0	100	2	0	2	0	4	989
% Approach	0.2%	94.3%	5.5%	0%	-	24.7%	74.4%	0.9%	0%	-	5.0%	1.0%	94.0%	0%	-	50.0%	0%	50.0%	0%	-	-
% Total	0.1%	41.5%	2.4%	0%	44.0%	11.2%	33.9%	0.4%	0%	45.5%	0.5%	0.1%	9.5%	0%	10.1%	0.2%	0%	0.2%	0%	0.4%	-
PHF	0.250	0.861	0.667	-	0.850	0.816	0.952	0.500	-	0.970	0.417	0.250	0.904	-	0.926	0.500	-	0.500	-	0.500	0.916
Lights	1	407	24	0	432	111	334	4	0	449	5	1	94	0	100	2	0	2	0	4	985
% Lights	100%	99.3%	100%	0%	99.3%	100%	99.7%	100%	0%	99.8%	100%	100%	100%	0%	100%	100%	0%	100%	0%	100%	99.6%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Buses and Single-Unit Trucks	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
% Buses and Single-Unit Trucks	0%	0.7%	0%	0%	0.7%	0%	0.3%	0%	0%	0.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.4%

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

W Oaks Dr and Karevich Drive/Proposed Site DW - TMC

Thu Jan 25, 2024

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1150537, Location: 42.491062, -83.477498



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE, Grand Rapids, MI, 49546, US

[N] N Karevich Dr

Total: 10
In: 4 Out: 6

22

[W] W Oaks Dr
Total: 777
In: 435 Out: 342

1
410
24

4
335
111

[E] W Oaks Dr
Total: 956
In: 450 Out: 506

Out: 135 In: 100
Total: 235
[S] N Karevich Dr

5
1
94

Twelve Oaks Drive N and Karevich Drive - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150500, Location: 42.49327, -83.476748



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Drive Eastbound					Twelve Oaks Drive Westbound					N Karevich Drive Northbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2024-01-25 11:00AM	32	1	1	34	0	0	24	0	24	0	2	0	0	2	0	60
11:15AM	27	1	0	28	0	0	30	0	30	0	0	0	0	0	0	58
11:30AM	29	0	0	29	0	1	30	0	31	0	1	1	0	2	0	62
11:45AM	32	0	0	32	0	2	36	1	39	0	0	1	0	1	0	72
Hourly Total	120	2	1	123	0	3	120	1	124	0	3	2	0	5	0	252
12:00PM	45	2	0	47	0	2	27	0	29	0	0	0	0	0	0	76
12:15PM	41	0	0	41	0	2	19	0	21	0	1	0	0	1	0	63
12:30PM	35	1	0	36	0	0	36	1	37	0	0	1	0	1	1	74
12:45PM	38	0	0	38	0	1	24	1	26	0	0	1	0	1	2	65
Hourly Total	159	3	0	162	0	5	106	2	113	0	1	2	0	3	3	278
4:00PM	24	0	0	24	0	0	33	0	33	0	0	2	0	2	0	59
4:15PM	33	0	0	33	0	1	27	0	28	0	1	1	0	2	0	63
4:30PM	38	0	0	38	0	1	22	1	24	0	1	0	0	1	0	63
4:45PM	31	1	0	32	0	1	31	0	32	0	0	0	0	0	0	64
Hourly Total	126	1	0	127	0	3	113	1	117	0	2	3	0	5	0	249
5:00PM	33	1	1	35	0	1	38	0	39	0	0	3	0	3	0	77
5:15PM	42	1	0	43	0	0	32	0	32	0	1	0	0	1	0	76
5:30PM	16	0	0	16	0	0	27	0	27	0	0	2	0	2	0	45
5:45PM	36	1	0	37	0	0	32	0	32	0	1	3	0	4	0	73
Hourly Total	127	3	1	131	0	1	129	0	130	0	2	8	0	10	0	271
Total	532	9	2	543	0	12	468	4	484	0	8	15	0	23	3	1050
% Approach	98.0%	1.7%	0.4%	-	-	2.5%	96.7%	0.8%	-	-	34.8%	65.2%	0%	-	-	-
% Total	50.7%	0.9%	0.2%	51.7%	-	1.1%	44.6%	0.4%	46.1%	-	0.8%	1.4%	0%	2.2%	-	-
Lights	527	9	2	538	-	12	461	4	477	-	8	15	0	23	-	1038
% Lights	99.1%	100%	100%	99.1%	-	100%	98.5%	100%	98.6%	-	100%	100%	0%	100%	-	98.9%
Articulated Trucks	1	0	0	1	-	0	0	0	0	-	0	0	0	0	-	1
% Articulated Trucks	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%
Buses and Single-Unit Trucks	4	0	0	4	-	0	7	0	7	-	0	0	0	0	-	11
% Buses and Single-Unit Trucks	0.8%	0%	0%	0.7%	-	0%	1.5%	0%	1.4%	-	0%	0%	0%	0%	-	1.0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Twelve Oaks Drive N and Karevich Drive - TMC

Thu Jan 25, 2024

Full Length (11 AM-1 PM, 4 PM-6 PM)

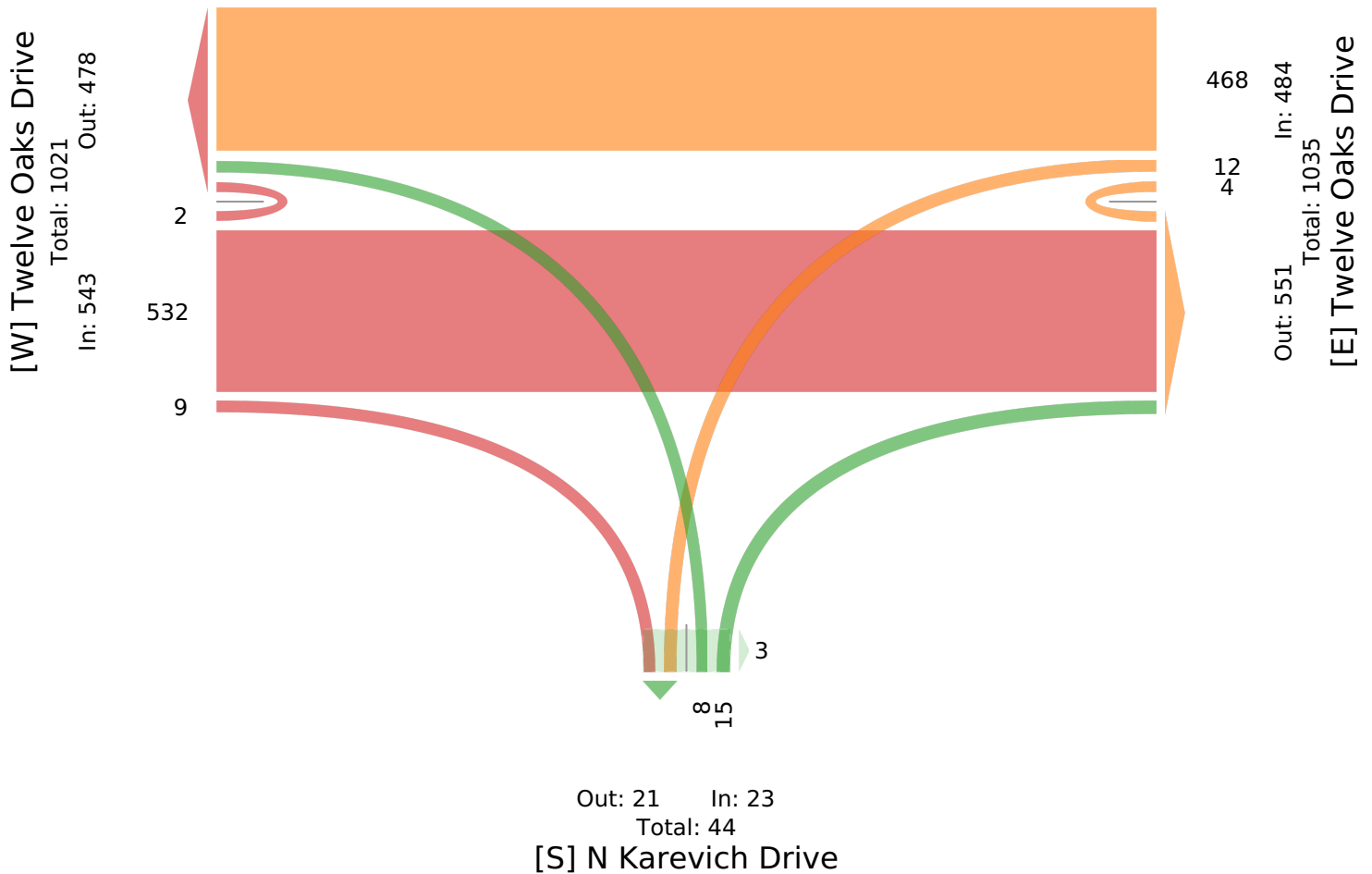
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150500, Location: 42.49327, -83.476748



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US



Twelve Oaks Drive N and Karevich Drive - TMC

Thu Jan 25, 2024

Midday Peak (11:45 AM - 12:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150500, Location: 42.49327, -83.476748



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Drive Eastbound					Twelve Oaks Drive Westbound					N Karevich Drive Northbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2024-01-25 11:45AM	32	0	0	32	0	2	36	1	39	0	0	1	0	1	0	72
12:00PM	45	2	0	47	0	2	27	0	29	0	0	0	0	0	0	76
12:15PM	41	0	0	41	0	2	19	0	21	0	1	0	0	1	0	63
12:30PM	35	1	0	36	0	0	36	1	37	0	0	1	0	1	1	74
Total	153	3	0	156	0	6	118	2	126	0	1	2	0	3	1	285
% Approach	98.1%	1.9%	0%	-	-	4.8%	93.7%	1.6%	-	-	33.3%	66.7%	0%	-	-	-
% Total	53.7%	1.1%	0%	54.7%	-	2.1%	41.4%	0.7%	44.2%	-	0.4%	0.7%	0%	1.1%	-	-
PHF	0.850	0.375	-	0.830	-	0.750	0.819	0.500	0.808	-	0.250	0.500	-	0.750	-	0.938
Lights	152	3	0	155	-	6	117	2	125	-	1	2	0	3	-	283
% Lights	99.3%	100%	0%	99.4%	-	100%	99.2%	100%	99.2%	-	100%	100%	0%	100%	-	99.3%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	1	0	0	1	-	0	1	0	1	-	0	0	0	0	-	2
% Buses and Single-Unit Trucks	0.7%	0%	0%	0.6%	-	0%	0.8%	0%	0.8%	-	0%	0%	0%	0%	-	0.7%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Twelve Oaks Drive N and Karevich Drive - TMC

Thu Jan 25, 2024

Midday Peak (11:45 AM - 12:45 PM) - Overall Peak Hour

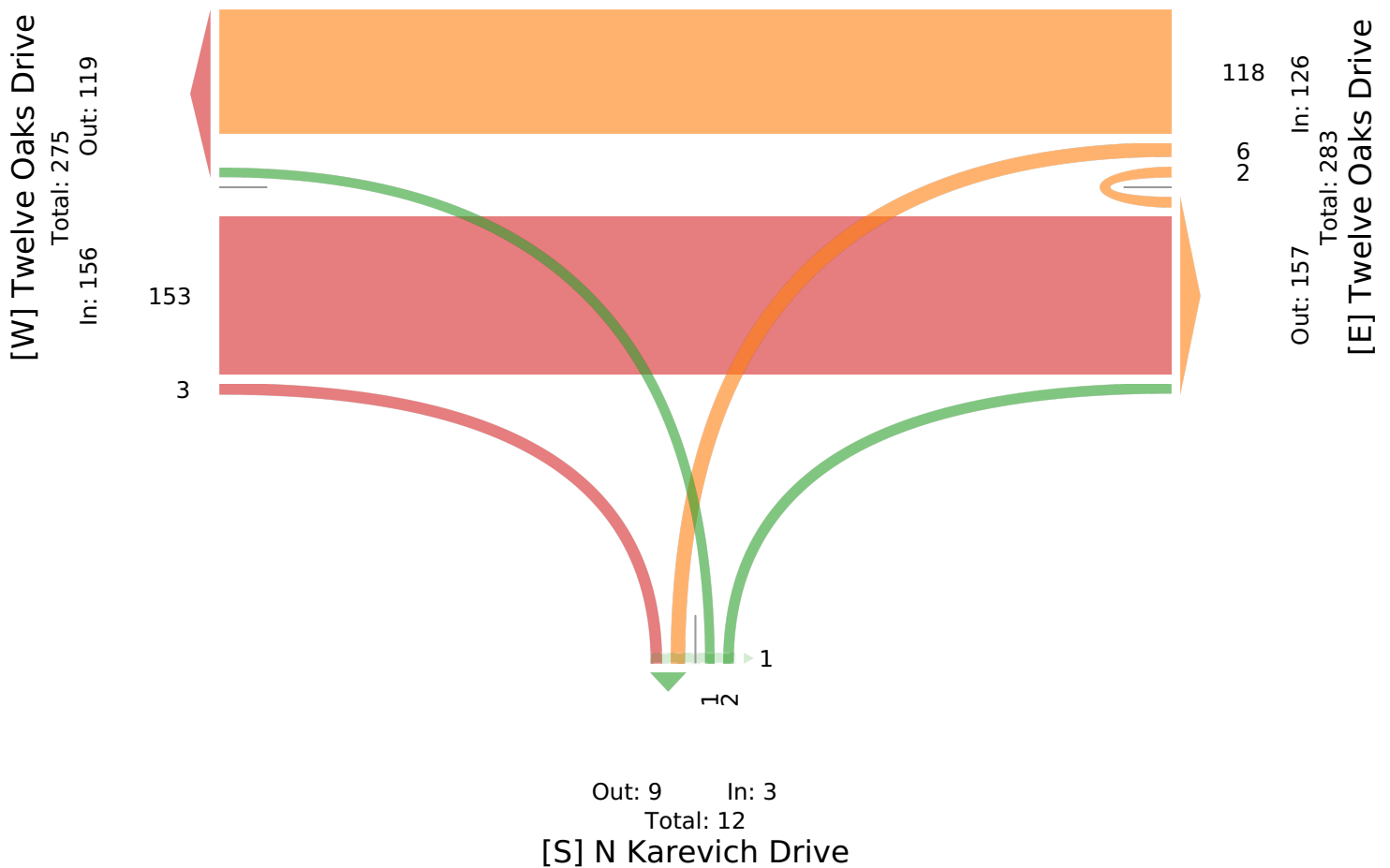
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150500, Location: 42.49327, -83.476748



Provided by: Fishbeck-Main Account
1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US



Twelve Oaks Drive N and Karevich Drive - TMC

Thu Jan 25, 2024

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

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1150500, Location: 42.49327, -83.476748



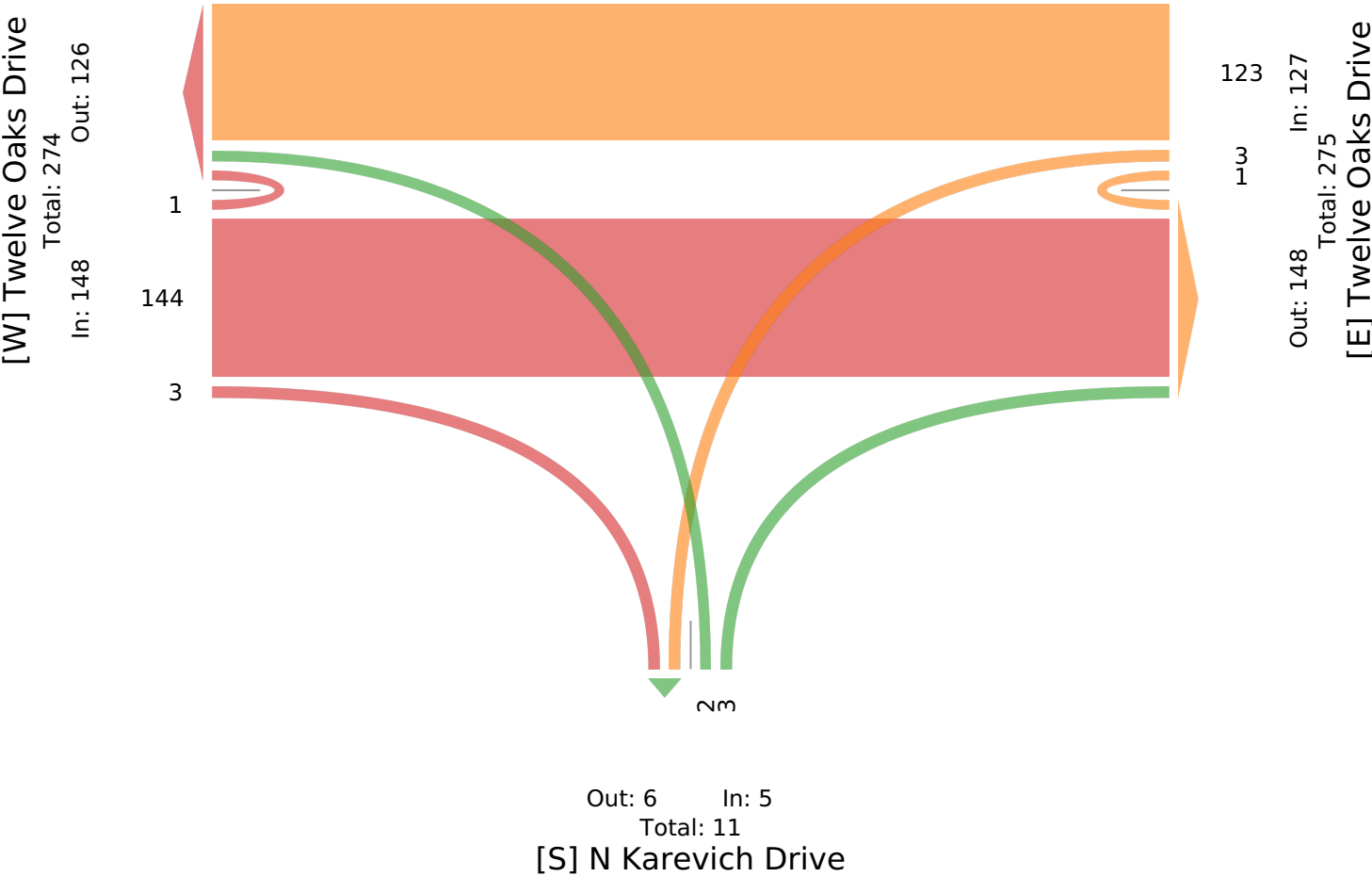
Provided by: Fishbeck-Main Account

1515 Arboretum Drive SE,
Grand Rapids, MI, 49546, US

Leg Direction	Twelve Oaks Drive Eastbound						Twelve Oaks Drive Westbound						N Karevich Drive Northbound						
Time	T	R	U	App	Ped*		L	T	U	App	Ped*		L	R	U	App	Ped*	Int	
2024-01-25 4:30PM	38	0	0	38	0		1	22	1	24	0		1	0	0	1	0	63	
4:45PM	31	1	0	32	0		1	31	0	32	0		0	0	0	0	0	64	
5:00PM	33	1	1	35	0		1	38	0	39	0		0	3	0	3	0	77	
5:15PM	42	1	0	43	0		0	32	0	32	0		1	0	0	1	0	76	
Total	144	3	1	148	0		3	123	1	127	0		2	3	0	5	0	280	
% Approach	97.3%	2.0%	0.7%	-	-		2.4%	96.9%	0.8%	-	-		40.0%	60.0%	0%	-	-	-	
% Total	51.4%	1.1%	0.4%	52.9%	-		1.1%	43.9%	0.4%	45.4%	-		0.7%	1.1%	0%	1.8%	-	-	
PHF	0.857	0.750	0.250	0.860	-		0.750	0.809	0.250	0.814	-		0.500	0.250	-	0.417	-	0.909	
Lights	143	3	1	147	-		3	121	1	125	-		2	3	0	5	-	277	
% Lights	99.3%	100%	100%	99.3%	-		100%	98.4%	100%	98.4%	-		100%	100%	0%	100%	-	98.9%	
Articulated Trucks	0	0	0	0	-		0	0	0	0	-		0	0	0	0	-	0	
% Articulated Trucks	0%	0%	0%	0%	-		0%	0%	0%	0%	-		0%	0%	0%	0%	-	0%	
Buses and Single-Unit Trucks	1	0	0	1	-		0	2	0	2	-		0	0	0	0	-	3	
% Buses and Single-Unit Trucks	0.7%	0%	0%	0.7%	-		0%	1.6%	0%	1.6%	-		0%	0%	0%	0%	-	1.1%	
Pedestrians	-	-	-	-	0		-	-	-	-	0		-	-	-	-	0		
% Pedestrians	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	-	
Bicycles on Crosswalk	-	-	-	-	0		-	-	-	-	0		-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	-	

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Twelve Oaks Drive N and Karevich Drive - TMC
Thu Jan 25, 2024
PM Peak (4:30 PM - 5:30 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)
All Movements
ID: 1150500, Location: 42.49327, -83.476748



Appendix 2

Existing LOS Output Reports

HCM 6th Signalized Intersection Summary

1: Novi Road & Oaks Drive South/Twelve Oaks Drive

2024 Existing Conditions
m.d. Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	46	307	330	59	40	326	764	260	17	672	47
Future Volume (veh/h)	66	46	307	330	59	40	326	764	260	17	672	47
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	1984	1984	1984	1984	1984	1984	1969	1969	1969	1984	1984	1984
Adj Flow Rate, veh/h	72	50	321	363	65	41	351	822	155	18	707	32
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	189	198	664	474	147	93	453	1989	617	171	1822	566
Arrive On Green	0.10	0.10	0.10	0.13	0.13	0.13	0.12	0.37	0.37	0.03	0.11	0.11
Sat Flow, veh/h	1890	1984	2960	3666	1138	718	3638	5375	1668	1890	5417	1682
Grp Volume(v), veh/h	72	50	321	363	0	106	351	822	155	18	707	32
Grp Sat Flow(s),veh/h/ln	1890	1984	1480	1833	0	1855	1819	1792	1668	1890	1806	1682
Q Serve(g_s), s	2.9	1.9	7.5	7.7	0.0	4.2	7.5	9.1	5.2	0.7	9.7	1.4
Cycle Q Clear(g_c), s	2.9	1.9	7.5	7.7	0.0	4.2	7.5	9.1	5.2	0.7	9.7	1.4
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	189	198	664	474	0	240	453	1989	617	171	1822	566
V/C Ratio(X)	0.38	0.25	0.48	0.77	0.00	0.44	0.78	0.41	0.25	0.10	0.39	0.06
Avail Cap(c_a), veh/h	189	198	664	596	0	301	618	1989	617	171	1822	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	33.7	33.2	27.0	33.7	0.0	32.2	33.9	18.7	17.5	35.6	27.9	24.2
Incr Delay (d2), s/veh	1.3	0.7	0.5	4.6	0.0	1.3	4.2	0.6	1.0	1.2	0.6	0.2
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	1.4	0.9	2.7	3.7	0.0	2.0	3.4	3.5	1.9	0.4	4.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	33.9	27.5	38.3	0.0	33.4	38.2	19.4	18.5	36.8	28.5	24.4
LnGrp LOS	C	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	443			469			1328			757		
Approach Delay, s/veh	29.5			37.2			24.2			28.5		
Approach LOS	C			D			C			C		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	13.7	36.0	16.3		16.4	33.3	14.0					
Change Period (Y+Rc), s	6.4	6.4	6.0		6.4	6.4	6.0					
Max Green Setting (Gmax), s	4.6	29.6	13.0		13.6	20.6	8.0					
Max Q Clear Time (g_c+I1), s	2.7	11.1	9.7		9.5	11.7	9.5					
Green Ext Time (p_c), s	0.0	5.5	0.7		0.5	3.0	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	28.1											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

2: Novi Road & Oaks Drive North

2024 Existing Conditions
m.d. Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	17	105	27	20	45	87	757	26	85	604	19
Future Volume (veh/h)	43	17	105	27	20	45	87	757	26	85	604	19
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			
Adj Sat Flow, veh/h/ln	1984	1984	1984	1969	1969	1969	1953	1953	1953	1984	1984	1984
Adj Flow Rate, veh/h	47	18	51	34	25	25	96	832	28	92	657	21
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	3	3	3	1	1	1
Cap, veh/h	114	28	78	77	58	59	530	1998	891	435	2900	92
Arrive On Green	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.54	0.54	0.04	0.54	0.54
Sat Flow, veh/h	1890	457	1295	1457	1095	1112	1860	3711	1655	1890	5393	172
Grp Volume(v), veh/h	47	0	69	44	0	40	96	832	28	92	439	239
Grp Sat Flow(s),veh/h/ln	1890	0	1751	1896	0	1769	1860	1856	1655	1890	1806	1953
Q Serve(g_s), s	1.9	0.0	3.1	1.8	0.0	1.7	1.8	10.7	0.6	1.7	5.1	5.1
Cycle Q Clear(g_c), s	1.9	0.0	3.1	1.8	0.0	1.7	1.8	10.7	0.6	1.7	5.1	5.1
Prop In Lane	1.00		0.74	0.77		0.63	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	114	0	106	100	0	93	530	1998	891	435	1942	1051
V/C Ratio(X)	0.41	0.00	0.65	0.44	0.00	0.43	0.18	0.42	0.03	0.21	0.23	0.23
Avail Cap(c_a), veh/h	213	0	197	308	0	287	699	1998	891	607	1942	1051
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	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	36.8	36.7	0.0	36.7	7.6	11.0	8.7	8.2	9.7	9.7
Incr Delay (d2), s/veh	2.4	0.0	6.7	3.0	0.0	3.0	0.2	0.6	0.1	0.2	0.3	0.5
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	1.0	0.0	1.5	0.9	0.0	0.8	0.6	3.8	0.2	0.6	1.8	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.0	43.4	39.8	0.0	39.8	7.7	11.6	8.7	8.4	10.0	10.2
LnGrp LOS	D	A	D	D	A	D	A	B	A	A	A	B
Approach Vol, veh/h	116				84				956		770	
Approach Delay, s/veh	41.5				39.8				11.1		9.9	
Approach LOS	D				D				B		A	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.7	49.3	10.2		9.7	49.2	10.8					
Change Period (Y+Rc), s	6.2	* 6.2	6.0		* 6.2	* 6.2	6.0					
Max Green Setting (Gmax), s	15	* 23	13.0		* 11	* 23	9.0					
Max Q Clear Time (g_c+13), s	12.7	13.8	3.8		3.8	7.1	5.1					
Green Ext Time (p_c), s	0.1	3.8	0.2		0.1	3.5	0.1					

Intersection Summary

HCM 6th Ctrl Delay 13.7

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
3: Karevich Drive & Oaks Drive South

2024 Existing Conditions
m.d. Peak Hour

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	302	9	106	320	9	7	0	90	6	1	1
Future Vol, veh/h	1	302	9	106	320	9	7	0	90	6	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	81	81	81	60	60	60
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	0	0	0
Mvmt Flow	1	368	11	114	344	10	9	0	111	10	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	354	0	0	379	0	0	777	958	374	1008	958	177
Stage 1	-	-	-	-	-	-	376	376	-	577	577	-
Stage 2	-	-	-	-	-	-	401	582	-	431	381	-
Critical Hdwy	4.115	-	-	4.115	-	-	7.315	6.515	6.215	7.3	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.115	5.515	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.515	5.515	-	6.1	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2095	-	-	3.5095	4.0095	3.3095	3.5	4	3.3
Pot Cap-1 Maneuver	1209	-	-	1184	-	-	302	258	674	209	259	842
Stage 1	-	-	-	-	-	-	647	618	-	474	505	-
Stage 2	-	-	-	-	-	-	600	500	-	607	617	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1209	-	-	1184	-	-	278	233	674	162	234	842
Mov Cap-2 Maneuver	-	-	-	-	-	-	278	233	-	162	234	-
Stage 1	-	-	-	-	-	-	646	617	-	474	457	-
Stage 2	-	-	-	-	-	-	539	452	-	507	616	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2			12.3			25.6		
HCM LOS							B			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	611	1209	-	-	1184	-	-	188
HCM Lane V/C Ratio	0.196	0.001	-	-	0.096	-	-	0.071
HCM Control Delay (s)	12.3	8	-	-	8.4	-	-	25.6
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.7	0	-	-	0.3	-	-	0.2

HCM 6th TWSC
4: Karevich Drive & Oaks Drive North

2024 Existing Conditions
m.d. Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	163	3	8	118	1	2
Future Vol, veh/h	163	3	8	118	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	81	81	75	75
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	196	4	10	146	1	3
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	200	0	364	198
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1378	-	639	848
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	868	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1378	-	635	848
Mov Cap-2 Maneuver	-	-	-	-	635	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	862	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		9.7	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	763	-	-	1378	-	
HCM Lane V/C Ratio	0.005	-	-	0.007	-	
HCM Control Delay (s)	9.7	-	-	7.6	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Queuing and Blocking Report
2024 Existing Conditions

m.d. Peak Hour

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	TR	L	L	T	T	T
Maximum Queue (ft)	51	49	66	48	219	174	105	250	301	243	223	151
Average Queue (ft)	39	29	47	15	145	66	47	136	178	135	115	21
95th Queue (ft)	63	56	62	39	207	157	88	236	272	212	197	85
Link Distance (ft)	49	49	49	49	230	230	230			427	427	427
Upstream Blk Time (%)	22	11	14	0	0							
Queuing Penalty (veh)	23	11	15	0	0							
Storage Bay Dist (ft)								400	400			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	76	91	190	179	167	105
Average Queue (ft)	38	14	121	105	79	29
95th Queue (ft)	65	53	177	163	148	78
Link Distance (ft)			694	694	694	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	350	115				80
Storage Blk Time (%)			14		8	0
Queuing Penalty (veh)			3		4	0

Intersection: 2: Novi Road & Oaks Drive North

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	LT	TR	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	82	100	74	100	89	200	246	42	108	178	132	98
Average Queue (ft)	30	54	22	35	35	72	85	7	33	73	40	23
95th Queue (ft)	66	96	58	73	72	180	201	29	79	148	109	68
Link Distance (ft)		95	166	166		694	694	694		408	408	408
Upstream Blk Time (%)	0	2										
Queuing Penalty (veh)	0	3										
Storage Bay Dist (ft)	80				275				100			
Storage Blk Time (%)	0	4				0			0	4		
Queuing Penalty (veh)	1	2				0			0	3		

Queuing and Blocking Report

2024 Existing Conditions

m.d. Peak Hour

Intersection: 3: Karevich Drive & Oaks Drive South

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	6	17	67	4	74	31
Average Queue (ft)	0	0	27	0	34	6
95th Queue (ft)	4	8	61	3	60	26
Link Distance (ft)		286		179	77	651
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	115		115			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Karevich Drive & Oaks Drive North

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	75	31	30
Average Queue (ft)	6	2	4
95th Queue (ft)	40	16	20
Link Distance (ft)	229	95	179
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 65

HCM 6th Signalized Intersection Summary

1: Novi Road & Oaks Drive South/Twelve Oaks Drive

2024 Existing Conditions
p.m. Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	41	426	339	63	39	349	874	175	21	803	56
Future Volume (veh/h)	79	41	426	339	63	39	349	874	175	21	803	56
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	2000	2000	2000	2000	2000	2000	1984	1984	1984	2000	2000	2000
Adj Flow Rate, veh/h	91	47	387	404	75	38	384	960	121	22	845	43
Peak Hour Factor	0.87	0.87	0.87	0.84	0.84	0.84	0.91	0.91	0.91	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	0	0	0
Cap, veh/h	180	189	671	514	174	88	477	2144	666	208	2047	635
Arrive On Green	0.09	0.09	0.09	0.14	0.14	0.14	0.13	0.40	0.40	0.11	0.37	0.37
Sat Flow, veh/h	1905	2000	2983	3695	1252	634	3666	5417	1682	1905	5460	1695
Grp Volume(v), veh/h	91	47	387	404	0	113	384	960	121	22	845	43
Grp Sat Flow(s),veh/h/ln	1905	2000	1492	1848	0	1886	1833	1806	1682	1905	1820	1695
Q Serve(g_s), s	4.3	2.1	9.0	10.0	0.0	5.2	9.7	12.4	4.5	1.0	10.9	1.5
Cycle Q Clear(g_c), s	4.3	2.1	9.0	10.0	0.0	5.2	9.7	12.4	4.5	1.0	10.9	1.5
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	189	671	514	0	263	477	2144	666	208	2047	635
V/C Ratio(X)	0.50	0.25	0.58	0.79	0.00	0.43	0.80	0.45	0.18	0.11	0.41	0.07
Avail Cap(c_a), veh/h	180	189	671	700	0	357	679	2144	666	208	2047	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	40.9	39.9	32.8	39.5	0.0	37.4	40.1	21.1	18.7	38.1	22.0	19.0
Incr Delay (d2), s/veh	2.2	0.7	1.2	4.1	0.0	1.1	4.7	0.7	0.6	1.0	0.6	0.2
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	2.1	1.1	4.1	4.8	0.0	2.5	4.5	4.9	1.7	0.5	4.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	40.5	34.0	43.7	0.0	38.6	44.8	21.8	19.3	39.1	22.6	19.2
LnGrp LOS	D	D	C	D	A	D	D	C	B	D	C	B
Approach Vol, veh/h	525			517			1465			910		
Approach Delay, s/veh	36.2			42.5			27.6			22.8		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	16.8	44.0	19.2		18.8	42.0	15.0					
Change Period (Y+Rc), s	6.4	6.4	6.0		6.4	6.4	6.0					
Max Green Setting (Gmax), s	5.6	37.6	18.0		17.6	25.6	9.0					
Max Q Clear Time (g_c+I1), s	3.0	14.4	12.0		11.7	12.9	11.0					
Green Ext Time (p_c), s	0.0	6.9	1.2		0.7	4.4	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	29.9											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

2: Novi Road & Oaks Drive North

2024 Existing Conditions
p.m. Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	12	93	48	33	49	79	869	44	49	739	29
Future Volume (veh/h)	48	12	93	48	33	49	79	869	44	49	739	29
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			
Adj Sat Flow, veh/h/ln	1984	1984	1984	2000	2000	2000	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	53	13	44	63	43	44	90	988	50	53	795	30
Peak Hour Factor	0.91	0.91	0.91	0.76	0.76	0.76	0.88	0.88	0.88	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	98	21	70	97	68	71	495	2249	1003	459	3161	119
Arrive On Green	0.05	0.05	0.05	0.06	0.06	0.06	0.08	1.00	1.00	0.03	0.59	0.59
Sat Flow, veh/h	1890	397	1345	1528	1075	1119	1890	3770	1682	1890	5358	202
Grp Volume(v), veh/h	53	0	57	79	0	71	90	988	50	53	535	290
Grp Sat Flow(s),veh/h/ln	1890	0	1742	1924	0	1799	1890	1885	1682	1890	1806	1948
Q Serve(g_s), s	2.6	0.0	3.0	3.8	0.0	3.6	1.8	0.0	0.0	1.0	6.8	6.8
Cycle Q Clear(g_c), s	2.6	0.0	3.0	3.8	0.0	3.6	1.8	0.0	0.0	1.0	6.8	6.8
Prop In Lane	1.00		0.77	0.79		0.62	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	98	0	90	122	0	114	495	2249	1003	459	2131	1149
V/C Ratio(X)	0.54	0.00	0.63	0.65	0.00	0.62	0.18	0.44	0.05	0.12	0.25	0.25
Avail Cap(c_a), veh/h	199	0	183	223	0	208	697	2249	1003	673	2131	1149
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	0.0	44.2	43.5	0.0	43.4	6.9	0.0	0.0	7.0	9.4	9.4
Incr Delay (d2), s/veh	4.6	0.0	7.1	5.7	0.0	5.4	0.2	0.6	0.1	0.1	0.3	0.5
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	1.3	0.0	1.5	2.0	0.0	1.8	0.6	0.2	0.0	0.4	2.4	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.6	0.0	51.3	49.2	0.0	48.8	7.1	0.6	0.1	7.1	9.7	9.9
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h	110				150		1128				878	
Approach Delay, s/veh	50.0				49.0		1.1				9.6	
Approach LOS	D				D		A				A	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.2	62.9	12.0		9.8	62.2	10.9					
Change Period (Y+Rc), s	6.2	* 6.2	6.0		* 6.2	* 6.2	6.0					
Max Green Setting (Gmax), s	14	* 36	11.0		* 14	* 36	10.0					
Max Q Clear Time (g_c+13), s	2.0		5.8		3.8	8.8	5.0					
Green Ext Time (p_c), s	0.1	7.7	0.3		0.1	5.2	0.1					

Intersection Summary

HCM 6th Ctrl Delay	9.9
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
3: Karevich Drive & Oaks Drive South

2024 Existing Conditions
p.m. Peak Hour

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	410	24	111	335	4	5	1	94	2	0	2
Future Vol, veh/h	1	410	24	111	335	4	5	1	94	2	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	95	95	95	93	93	93	60	60	60
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	482	28	117	353	4	5	1	101	3	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	357	0	0	510	0	0	909	1089	496	1138	1101	179
Stage 1	-	-	-	-	-	-	498	498	-	589	589	-
Stage 2	-	-	-	-	-	-	411	591	-	549	512	-
Critical Hdwy	4.115	-	-	4.1	-	-	7.3	6.5	6.2	7.3	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1206	-	-	1065	-	-	245	217	578	169	214	839
Stage 1	-	-	-	-	-	-	558	548	-	466	499	-
Stage 2	-	-	-	-	-	-	594	498	-	524	540	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1206	-	-	1065	-	-	223	193	578	127	190	839
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	193	-	127	190	-
Stage 1	-	-	-	-	-	-	557	547	-	466	444	-
Stage 2	-	-	-	-	-	-	527	443	-	431	539	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.2			13.6			21.8		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	526	1206	-	-	1065	-	-	221
HCM Lane V/C Ratio	0.204	0.001	-	-	0.11	-	-	0.03
HCM Control Delay (s)	13.6	8	-	-	8.8	-	-	21.8
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.4	-	-	0.1

HCM 6th TWSC
4: Karevich Drive & Oaks Drive North

2024 Existing Conditions
p.m. Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	3	4	137	2	3
Future Vol, veh/h	150	3	4	137	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	81	81	60	60
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	174	3	5	169	3	5

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	177	0	355	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1399	-	647	872
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	857	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1399	-	644	872
Mov Cap-2 Maneuver	-	-	-	-	644	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	854	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	764	-	-	1399	-
HCM Lane V/C Ratio	0.011	-	-	0.004	-
HCM Control Delay (s)	9.8	-	-	7.6	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Queuing and Blocking Report
2024 Existing Conditions

p.m. Peak Hour

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	TR	L	L	T	T	T
Maximum Queue (ft)	52	49	66	48	231	177	122	283	324	242	234	131
Average Queue (ft)	43	28	49	23	146	77	43	148	186	147	134	31
95th Queue (ft)	63	58	62	46	216	167	93	260	298	226	212	98
Link Distance (ft)	49	49	49	49	230	230	230			427	427	427
Upstream Blk Time (%)	33	11	25	1	0							
Queuing Penalty (veh)	45	15	34	1	0							
Storage Bay Dist (ft)								400	400			
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	72	138	231	214	187	101
Average Queue (ft)	29	19	138	122	90	27
95th Queue (ft)	57	70	205	185	155	72
Link Distance (ft)			694	694	694	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	350	115				80
Storage Blk Time (%)			22		8	0
Queuing Penalty (veh)			5		5	0

Intersection: 2: Novi Road & Oaks Drive North

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	LT	TR	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	83	100	109	108	69	246	268	39	84	176	138	69
Average Queue (ft)	36	46	38	44	31	65	80	10	23	90	48	24
95th Queue (ft)	71	88	80	87	60	180	201	32	62	161	113	59
Link Distance (ft)		95	166	166		694	694	694		408	408	408
Upstream Blk Time (%)	0	2										
Queuing Penalty (veh)	0	3										
Storage Bay Dist (ft)	80				275				100			
Storage Blk Time (%)	1	3				0				5		
Queuing Penalty (veh)	1	1				0				2		

Queuing and Blocking Report

2024 Existing Conditions

p.m. Peak Hour

Intersection: 3: Karevich Drive & Oaks Drive South

Movement	EB	WB	NB	SB
Directions Served	TR	L	LTR	LTR
Maximum Queue (ft)	12	81	74	29
Average Queue (ft)	1	33	32	4
95th Queue (ft)	8	68	56	22
Link Distance (ft)	286		77	651
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)		115		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 4: Karevich Drive & Oaks Drive North

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	47	6	30
Average Queue (ft)	3	1	4
95th Queue (ft)	25	8	20
Link Distance (ft)	229	95	179
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 113

Appendix 3

Trip Generation Calculations

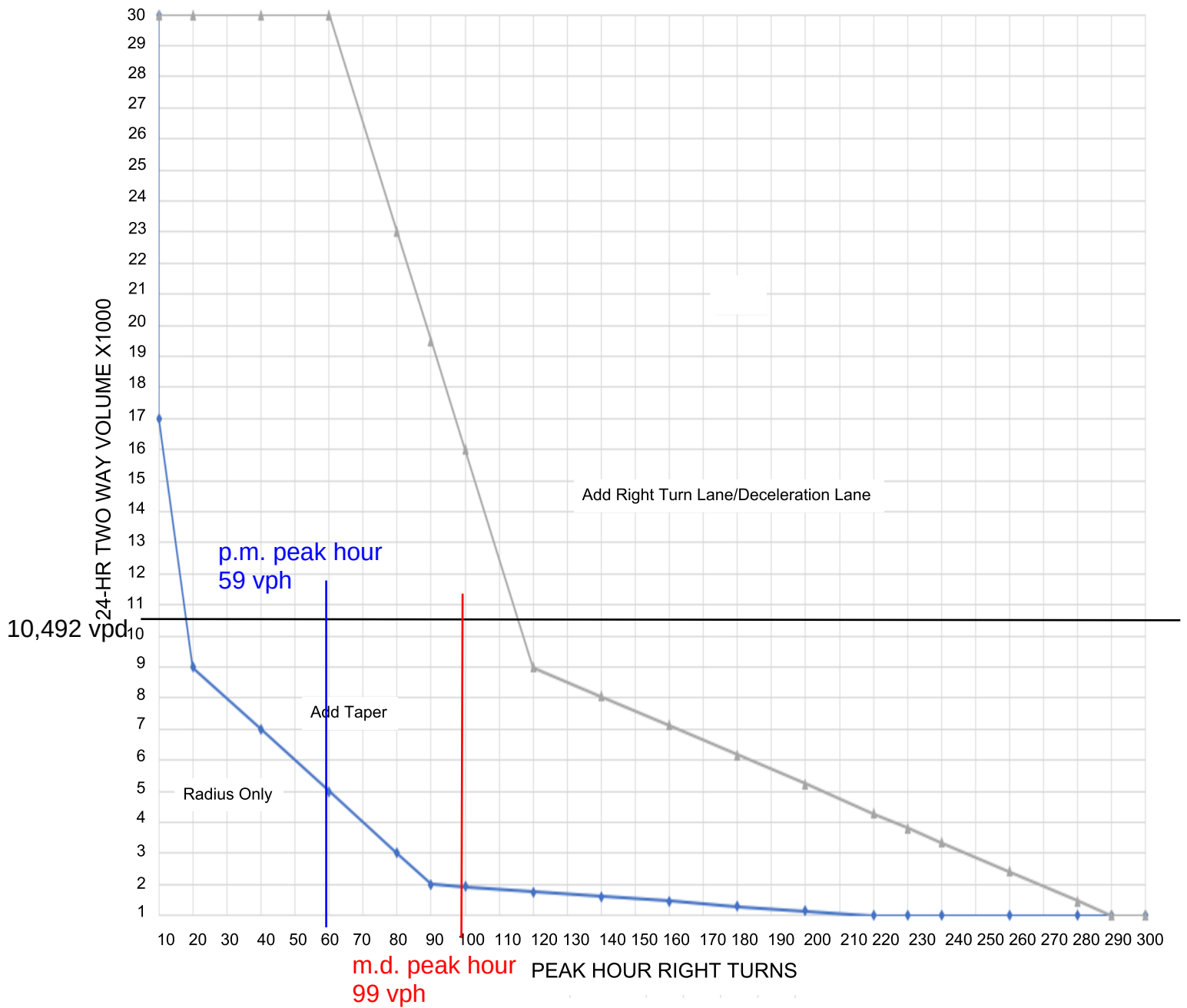
Trip Generation - Weekday Summary												
ITE Code	ITE Rate Description	Unit	Amount	MD			PM			WD		
				Ingress	Egress	Total	Ingress	Egress	Total	Ingress	Egress	Total
				115	115	230	71	65	136	959	960	1919
				Pass-by	63	63	126	39	36	75		
		Total Trips	52	52	104	32	29	61	959	960	1919	
ITE Trip Generation Rates - Weekday												
ITE Code	ITE Rate Description	Unit	Amount	R2	Rate	Pass-by						
ITE 934	Fast Food Restaurant with Drive Through Window	SFT	4,106									
MD	N/A		230	N/A	12% WD	55%						
PM	N/A		136	N/A	33.03	55%						
WD	N/A		1919	N/A	467.48							
				AM			PM			WD		
				Ingress	Egress	Total	Ingress	Egress	Total	Ingress	Egress	Total
Directional Distribution				50%	50%	100%	52%	48%	100%	50%	50%	100%
Volume Distribution				115	115	230	71	65	136	959	960	1919

Appendix 4

Turn Lane Warrants

FIGURE 6-3

WARRANT FOR RIGHT TURN DECELERATION LANE OR TAPER



Appendix 5

Future LOS Output Reports

HCM 6th Signalized Intersection Summary

1: Novi Road & Oaks Drive South/Twelve Oaks Drive

2024 Future Conditions
m.d. Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	52	352	330	67	40	391	723	260	17	650	64
Future Volume (veh/h)	95	52	352	330	67	40	391	723	260	17	650	64
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	1984	1984	1984	1984	1984	1984	1969	1969	1969	1984	1984	1984
Adj Flow Rate, veh/h	103	57	370	363	74	41	420	777	155	18	684	50
Peak Hour Factor	0.92	0.92	0.92	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	213	223	762	475	155	86	527	1921	596	171	1642	510
Arrive On Green	0.11	0.11	0.11	0.13	0.13	0.13	0.14	0.36	0.36	0.03	0.10	0.10
Sat Flow, veh/h	1890	1984	2960	3666	1200	665	3638	5375	1668	1890	5417	1682
Grp Volume(v), veh/h	103	57	370	363	0	115	420	777	155	18	684	50
Grp Sat Flow(s),veh/h/ln	1890	1984	1480	1833	0	1865	1819	1792	1668	1890	1806	1682
Q Serve(g_s), s	4.1	2.1	8.5	7.7	0.0	4.6	8.9	8.7	5.3	0.7	9.5	2.2
Cycle Q Clear(g_c), s	4.1	2.1	8.5	7.7	0.0	4.6	8.9	8.7	5.3	0.7	9.5	2.2
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	213	223	762	475	0	241	527	1921	596	171	1642	510
V/C Ratio(X)	0.48	0.26	0.49	0.76	0.00	0.48	0.80	0.40	0.26	0.11	0.42	0.10
Avail Cap(c_a), veh/h	213	223	762	596	0	303	709	1921	596	171	1642	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	33.3	32.4	25.2	33.6	0.0	32.3	33.1	19.3	18.2	35.7	29.4	26.1
Incr Delay (d2), s/veh	1.7	0.6	0.5	4.6	0.0	1.5	4.6	0.6	1.1	1.2	0.8	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	2.0	1.0	3.0	3.7	0.0	2.1	4.0	3.4	2.0	0.4	4.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	33.0	25.7	38.2	0.0	33.8	37.7	19.9	19.3	36.8	30.1	26.4
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	530			478			1352			752		
Approach Delay, s/veh	28.3			37.1			25.4			30.0		
Approach LOS	C			D			C			C		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	13.6	35.0	16.4		18.0	30.6	15.0					
Change Period (Y+Rc), s	6.4	6.4	6.0		6.4	6.4	6.0					
Max Green Setting (Gmax), s	4.6	28.6	13.0		15.6	17.6	9.0					
Max Q Clear Time (g_c+I1), s	2.7	10.7	9.7		10.9	11.5	10.5					
Green Ext Time (p_c), s	0.0	5.1	0.7		0.7	2.3	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	28.8											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

2: Novi Road & Oaks Drive North

2024 Future Conditions
m.d. Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	17	105	27	20	45	87	745	26	85	599	37
Future Volume (veh/h)	70	17	105	27	20	45	87	745	26	85	599	37
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			
Adj Sat Flow, veh/h/ln	1984	1984	1984	1969	1969	1969	1953	1953	1953	1984	1984	1984
Adj Flow Rate, veh/h	76	18	51	34	25	25	96	819	28	92	651	40
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.91	0.91	0.91	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	3	3	3	1	1	1
Cap, veh/h	120	29	83	77	58	59	521	1985	885	437	2789	170
Arrive On Green	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.53	0.53	0.04	0.53	0.53
Sat Flow, veh/h	1890	457	1295	1457	1095	1112	1860	3711	1655	1890	5220	319
Grp Volume(v), veh/h	76	0	69	44	0	40	96	819	28	92	449	242
Grp Sat Flow(s),veh/h/ln	1890	0	1751	1896	0	1769	1860	1856	1655	1890	1806	1927
Q Serve(g_s), s	3.1	0.0	3.1	1.8	0.0	1.7	1.8	10.5	0.6	1.7	5.3	5.3
Cycle Q Clear(g_c), s	3.1	0.0	3.1	1.8	0.0	1.7	1.8	10.5	0.6	1.7	5.3	5.3
Prop In Lane	1.00		0.74	0.77		0.63	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	120	0	112	100	0	93	521	1985	885	437	1930	1030
V/C Ratio(X)	0.63	0.00	0.62	0.44	0.00	0.43	0.18	0.41	0.03	0.21	0.23	0.23
Avail Cap(c_a), veh/h	213	0	197	308	0	287	690	1985	885	609	1930	1030
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	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	0.0	36.5	36.7	0.0	36.7	7.7	11.1	8.8	8.3	9.9	9.9
Incr Delay (d2), s/veh	5.3	0.0	5.5	3.0	0.0	3.0	0.2	0.6	0.1	0.2	0.3	0.5
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	1.6	0.0	1.5	0.9	0.0	0.8	0.6	3.7	0.2	0.6	1.8	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	0.0	42.0	39.8	0.0	39.8	7.9	11.7	8.9	8.5	10.2	10.5
LnGrp LOS	D	A	D	D	A	D	A	B	A	A	B	B
Approach Vol, veh/h	145				84				943			
Approach Delay, s/veh	41.9				39.8				11.2			
Approach LOS	D				D				B			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.7	49.0	10.2		9.7	48.9	11.1					
Change Period (Y+Rc), s	6.2	* 6.2	6.0		* 6.2	* 6.2	6.0					
Max Green Setting (Gmax), s	15	* 23	13.0		* 11	* 23	9.0					
Max Q Clear Time (g_c+13), s	12.5		3.8		3.8	7.3	5.1					
Green Ext Time (p_c), s	0.1	3.8	0.2		0.1	3.6	0.2					

Intersection Summary

HCM 6th Ctrl Delay 14.3

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
3: Karevich Drive & Oaks Drive South

2024 Future Conditions
m.d. Peak Hour

Intersection												
Int Delay, s/veh	19.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	302	9	106	320	99	7	0	90	86	1	9
Future Vol, veh/h	8	302	9	106	320	99	7	0	90	86	1	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	93	93	93	81	81	81	60	60	60
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	0	0	0
Mvmt Flow	10	368	11	114	344	106	9	0	111	143	2	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	450	0	0	379	0	0	795	1072	374	1074	1024	225
Stage 1	-	-	-	-	-	-	394	394	-	625	625	-
Stage 2	-	-	-	-	-	-	401	678	-	449	399	-
Critical Hdwy	4.115	-	-	4.115	-	-	7.315	6.515	6.215	7.3	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.115	5.515	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.515	5.515	-	6.1	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2095	-	-	3.5095	4.0095	3.3095	3.5	4	3.3
Pot Cap-1 Maneuver	1115	-	-	1184	-	-	293	221	674	188	237	784
Stage 1	-	-	-	-	-	-	633	607	-	444	480	-
Stage 2	-	-	-	-	-	-	600	453	-	593	606	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1115	-	-	1184	-	-	263	198	674	144	212	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	198	-	144	212	-
Stage 1	-	-	-	-	-	-	627	602	-	440	434	-
Stage 2	-	-	-	-	-	-	530	410	-	491	601	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			1.7			12.4			137.2		
HCM LOS							B			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	606	1115	-	-	1184	-	-	156
HCM Lane V/C Ratio	0.198	0.009	-	-	0.096	-	-	1.026
HCM Control Delay (s)	12.4	8.3	-	-	8.4	-	-	137.2
HCM Lane LOS	B	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.7	0	-	-	0.3	-	-	8

HCM 6th TWSC
4: Karevich Drive & Oaks Drive North

2024 Future Conditions
m.d. Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	163	3	26	118	1	29
Future Vol, veh/h	163	3	26	118	1	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	81	81	75	75
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	196	4	32	146	1	39
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	200	0	408	198
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	210	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1378	-	603	848
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	830	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1378	-	589	848
Mov Cap-2 Maneuver	-	-	-	-	589	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	811	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.4		9.5	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	836	-	-	1378	-	
HCM Lane V/C Ratio	0.048	-	-	0.023	-	
HCM Control Delay (s)	9.5	-	-	7.7	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-	

Queuing and Blocking Report

2024 Future Conditions

m.d. Peak Hour

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	TR	L	L	T	T	T
Maximum Queue (ft)	50	49	61	50	227	173	109	382	405	378	299	219
Average Queue (ft)	44	28	48	18	146	65	44	273	312	232	145	31
95th Queue (ft)	62	56	62	43	211	160	89	435	459	477	307	133
Link Distance (ft)	49	49	49	49	230	230	230			427	427	427
Upstream Blk Time (%)	28	8	14	1	0			0	6	13	0	
Queuing Penalty (veh)	35	10	17	1	0			0	0	0	0	
Storage Bay Dist (ft)								400	400			
Storage Blk Time (%)								2	18	6		0
Queuing Penalty (veh)								4	42	26		1

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	106	111	194	179	157	101
Average Queue (ft)	45	18	125	107	81	35
95th Queue (ft)	92	67	179	160	138	83
Link Distance (ft)			694	694	694	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	350	115				80
Storage Blk Time (%)			17		7	0
Queuing Penalty (veh)			3		4	1

Intersection: 2: Novi Road & Oaks Drive North

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	LT	TR	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	90	104	66	87	93	224	255	56	116	147	133	86
Average Queue (ft)	40	55	22	33	31	83	100	10	39	72	37	25
95th Queue (ft)	80	99	57	67	68	193	217	35	86	140	98	64
Link Distance (ft)		95	166	166		694	694	694		408	408	408
Upstream Blk Time (%)	0	3										
Queuing Penalty (veh)	0	6										
Storage Bay Dist (ft)	80				275				100			
Storage Blk Time (%)	2	5				0			0	4		
Queuing Penalty (veh)	2	3				0			0	3		

Queuing and Blocking Report

2024 Future Conditions

m.d. Peak Hour

Intersection: 3: Karevich Drive & Oaks Drive South

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	30	10	58	79	120
Average Queue (ft)	3	1	24	33	43
95th Queue (ft)	18	7	55	62	96
Link Distance (ft)		286		77	651
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	115		115		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Karevich Drive & Oaks Drive North

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	37	31	39
Average Queue (ft)	3	4	18
95th Queue (ft)	19	21	42
Link Distance (ft)	229	95	179
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 159

HCM 6th Signalized Intersection Summary

1: Novi Road & Oaks Drive South/Twelve Oaks Drive

2024 Future Conditions
p.m. Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	43	454	339	67	39	387	850	175	21	788	69
Future Volume (veh/h)	95	43	454	339	67	39	387	850	175	21	788	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	2000	2000	2000	2000	2000	2000	1984	1984	1984	2000	2000	2000
Adj Flow Rate, veh/h	109	49	419	404	80	38	425	934	121	22	829	57
Peak Hour Factor	0.87	0.87	0.87	0.84	0.84	0.84	0.91	0.91	0.91	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	0	0	0
Cap, veh/h	221	232	769	504	175	83	520	2144	666	173	1883	585
Arrive On Green	0.12	0.12	0.12	0.14	0.14	0.14	0.14	0.40	0.40	0.06	0.23	0.23
Sat Flow, veh/h	1905	2000	2983	3695	1282	609	3666	5417	1682	1905	5460	1695
Grp Volume(v), veh/h	109	49	419	404	0	118	425	934	121	22	829	57
Grp Sat Flow(s),veh/h/ln	1905	2000	1492	1848	0	1890	1833	1806	1682	1905	1820	1695
Q Serve(g_s), s	5.1	2.1	11.0	10.1	0.0	5.5	10.7	12.0	4.5	1.0	12.3	2.5
Cycle Q Clear(g_c), s	5.1	2.1	11.0	10.1	0.0	5.5	10.7	12.0	4.5	1.0	12.3	2.5
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	232	769	504	0	258	520	2144	666	173	1883	585
V/C Ratio(X)	0.49	0.21	0.55	0.80	0.00	0.46	0.82	0.44	0.18	0.13	0.44	0.10
Avail Cap(c_a), veh/h	221	232	769	622	0	318	718	2144	666	173	1883	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.96	0.96	0.96
Uniform Delay (d), s/veh	39.4	38.1	30.4	39.8	0.0	37.8	39.6	21.0	18.7	41.0	28.7	24.9
Incr Delay (d2), s/veh	1.7	0.5	0.8	6.1	0.0	1.3	5.2	0.6	0.6	1.4	0.7	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	2.5	1.1	4.2	5.0	0.0	2.6	5.0	4.8	1.7	0.5	5.5	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	38.5	31.3	45.9	0.0	39.1	44.8	21.6	19.3	42.5	29.4	25.2
LnGrp LOS	D	D	C	D	A	D	D	C	B	D	C	C
Approach Vol, veh/h	577			522			1480			908		
Approach Delay, s/veh	33.7			44.3			28.1			29.4		
Approach LOS	C			D			C			C		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	15.0	44.0	19.0		19.9	39.2	17.0					
Change Period (Y+Rc), s	6.4	6.4	6.0		6.4	6.4	6.0					
Max Green Setting (Gmax), s	5.6	37.6	16.0		18.6	24.6	11.0					
Max Q Clear Time (g_c+I1), s	3.0	14.0	12.1		12.7	14.3	13.0					
Green Ext Time (p_c), s	0.0	6.7	0.9		0.8	3.9	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	31.8											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

2: Novi Road & Oaks Drive North

2024 Future Conditions
p.m. Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	12	93	48	33	49	79	861	44	49	737	40
Future Volume (veh/h)	63	12	93	48	33	49	79	861	44	49	737	40
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			
Adj Sat Flow, veh/h/ln	1984	1984	1984	2000	2000	2000	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	69	13	44	63	43	44	90	978	50	53	792	42
Peak Hour Factor	0.91	0.91	0.91	0.76	0.76	0.76	0.88	0.88	0.88	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	107	22	76	97	68	71	487	2231	995	459	3082	163
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.08	1.00	1.00	0.03	0.59	0.59
Sat Flow, veh/h	1890	397	1345	1528	1075	1119	1890	3770	1682	1890	5267	278
Grp Volume(v), veh/h	69	0	57	79	0	71	90	978	50	53	542	292
Grp Sat Flow(s),veh/h/ln	1890	0	1742	1924	0	1799	1890	1885	1682	1890	1806	1934
Q Serve(g_s), s	3.4	0.0	3.0	3.8	0.0	3.6	1.8	0.0	0.0	1.1	7.0	7.0
Cycle Q Clear(g_c), s	3.4	0.0	3.0	3.8	0.0	3.6	1.8	0.0	0.0	1.1	7.0	7.0
Prop In Lane	1.00		0.77	0.79		0.62	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	107	0	98	122	0	114	487	2231	995	459	2113	1132
V/C Ratio(X)	0.65	0.00	0.58	0.65	0.00	0.62	0.18	0.44	0.05	0.12	0.26	0.26
Avail Cap(c_a), veh/h	199	0	183	223	0	208	690	2231	995	674	2113	1132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	0.0	43.7	43.5	0.0	43.4	7.1	0.0	0.0	7.2	9.6	9.6
Incr Delay (d2), s/veh	6.4	0.0	5.3	5.7	0.0	5.4	0.2	0.6	0.1	0.1	0.3	0.6
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	1.8	0.0	1.5	2.0	0.0	1.8	0.6	0.2	0.0	0.4	2.5	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	49.0	49.2	0.0	48.8	7.2	0.6	0.1	7.3	9.9	10.2
LnGrp LOS	D	A	D	D	A	D	A	A	A	A	A	B
Approach Vol, veh/h	126				150				1118			
Approach Delay, s/veh	49.7				49.0				1.1			
Approach LOS	D				D				A			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.2	62.4	12.0		9.8	61.8	11.4					
Change Period (Y+Rc), s	6.2	* 6.2	6.0		* 6.2	* 6.2	6.0					
Max Green Setting (Gmax),s	14	* 36	11.0		* 14	* 36	10.0					
Max Q Clear Time (g_c+11), s	13	2.0	5.8		3.8	9.0	5.4					
Green Ext Time (p_c), s	0.1	7.6	0.3		0.1	5.3	0.2					

Intersection Summary

HCM 6th Ctrl Delay 10.3

HCM 6th LOS B

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
3: Karevich Drive & Oaks Drive South

2024 Future Conditions
p.m. Peak Hour

Intersection												
Int Delay, s/veh	7.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	410	24	111	335	59	5	1	94	48	0	6
Future Vol, veh/h	6	410	24	111	335	59	5	1	94	48	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	95	95	95	93	93	93	60	60	60
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	7	482	28	117	353	62	5	1	101	80	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	415	0	0	510	0	0	921	1159	496	1179	1142	208
Stage 1	-	-	-	-	-	-	510	510	-	618	618	-
Stage 2	-	-	-	-	-	-	411	649	-	561	524	-
Critical Hdwy	4.115	-	-	4.1	-	-	7.3	6.5	6.2	7.3	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2095	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1148	-	-	1065	-	-	241	197	578	158	202	804
Stage 1	-	-	-	-	-	-	550	541	-	448	484	-
Stage 2	-	-	-	-	-	-	594	469	-	516	533	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1148	-	-	1065	-	-	217	174	578	118	179	804
Mov Cap-2 Maneuver	-	-	-	-	-	-	217	174	-	118	179	-
Stage 1	-	-	-	-	-	-	547	538	-	445	431	-
Stage 2	-	-	-	-	-	-	522	417	-	422	530	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.9			13.7			79.3		
HCM LOS							B			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	522	1148	-	-	1065	-	-	130
HCM Lane V/C Ratio	0.206	0.006	-	-	0.11	-	-	0.692
HCM Control Delay (s)	13.7	8.2	-	-	8.8	-	-	79.3
HCM Lane LOS	B	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.8	0	-	-	0.4	-	-	3.8

HCM 6th TWSC
4: Karevich Drive & Oaks Drive North

2024 Future Conditions
p.m. Peak Hour

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	3	15	137	2	18
Future Vol, veh/h	150	3	15	137	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	81	81	60	60
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	174	3	19	169	3	30
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	177	0	383	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	207	-
Critical Hdwy	-	-	4.12	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1399	-	624	872
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	832	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1399	-	615	872
Mov Cap-2 Maneuver	-	-	-	-	615	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	820	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		9.5	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	837	-	-	1399	-	
HCM Lane V/C Ratio	0.04	-	-	0.013	-	
HCM Control Delay (s)	9.5	-	-	7.6	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Queuing and Blocking Report
2024 Future Conditions

p.m. Peak Hour

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	TR	L	L	T	T	T
Maximum Queue (ft)	52	49	68	55	242	183	128	371	396	382	319	218
Average Queue (ft)	47	25	51	27	153	78	53	251	286	222	156	42
95th Queue (ft)	59	53	63	49	222	174	105	414	435	436	283	141
Link Distance (ft)	49	49	49	49	230	230	230			427	427	427
Upstream Blk Time (%)	45	7	24	1	1			0	4	7	0	0
Queuing Penalty (veh)	67	10	36	2	0			0	0	0	0	0
Storage Bay Dist (ft)								400	400			
Storage Blk Time (%)								1	11	2		
Queuing Penalty (veh)								3	31	6		

Intersection: 1: Novi Road & Oaks Drive South/Twelve Oaks Drive

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	64	121	235	220	200	105
Average Queue (ft)	29	21	144	130	103	38
95th Queue (ft)	54	80	205	189	171	92
Link Distance (ft)			694	694	694	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	350	115				80
Storage Blk Time (%)		0	27		13	0
Queuing Penalty (veh)		0	6		9	0

Intersection: 2: Novi Road & Oaks Drive North

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	LT	TR	L	T	T	R	L	T	T	TR
Maximum Queue (ft)	92	104	104	129	89	279	321	70	125	187	166	87
Average Queue (ft)	42	48	40	46	34	76	93	13	26	92	53	29
95th Queue (ft)	80	85	84	95	72	208	240	44	69	169	130	70
Link Distance (ft)		95	166	166		694	694	694		408	408	408
Upstream Blk Time (%)	1	1		0								
Queuing Penalty (veh)	0	2		0								
Storage Bay Dist (ft)	80				275				100			
Storage Blk Time (%)	3	2							0	7		
Queuing Penalty (veh)	3	1							0	3		

Queuing and Blocking Report

2024 Future Conditions

p.m. Peak Hour

Intersection: 3: Karevich Drive & Oaks Drive South

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	24	23	66	4	82	74
Average Queue (ft)	2	2	26	0	35	32
95th Queue (ft)	14	13	57	3	61	63
Link Distance (ft)		286		179	77	651
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	115		115			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Karevich Drive & Oaks Drive North

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	57	31	42
Average Queue (ft)	3	3	14
95th Queue (ft)	29	16	40
Link Distance (ft)	229	95	179
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 181